A DISSERTATION OF TEN SURGICAL CONDITIONS SUBMITTED ON PARTIAL FULFILIMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE (SURGERY) OF THE UNIVERSITY OF DAR ES SALAAM

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This is to certify that the cases presented in this book were managed by Dr. Jasper S. Nduasinde during his period of Residency, under my direct or delegated supervision.

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ABSTRACT

This dissertation conforms to the requirements for the award of the degree of Master of Medicine in Surgery according to the regulations of the University of Dar es Salaam.

It consists of ten surgical conditions seen and partly or entirely managed by the author. It has been divided into four parts. The first part consists of five general surgical conditions, while the second part one pediatric condition . The third part consists of two urological conditions while the fourth, two orthopaedic and trauma conditions.

A typical case is presented for each condition. Literature is reviewed and current concepts, opinions, and treatment is presented followed by relevant discussion.

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TRAUMATIC RUPTURE OF THE SPLEEN

SUMMARY

In a one year period (1989), 20 adult patients with traumatic splenic injury were managed at the Department of Surgery of Muhimbili Medical Centre. The author had an opportunity of managing four of the cases. The age distribution ranged from 10 to 35 years, and 95% of them were below 30 years old. The female, male ratio was 1:9.

All presented with blunt or crush injury involving the left upper abdomen or left lower chest. Majority, complained of abdominal pain 100% and abdominal distension (25%). Palor, tachycardia, abdominal guarding and shifting abdominal dullness were the common signs encountered.

15% had major associated injuries notably compound fracture of left proximal third of femoral shaft, fracture ribs and compound fracture distal third of left tibia and fibula.

Laparatomy was performed in all cases and splenic injury of varying severity was evident. Total splenectomy was performed to eighteen patients and splenorrhaphy to two.

Each had an uneventiful postoperative period and at six months follow up they were perfectly well.

INTRODUCTION

The spleen is the commonest internal organ to be injured in blunt abdominal trauma. A blow or crush injury to the abdomen or left thorax is usually responsible although a fall onto a protruding object can inflict the same catastrophe[1].

The mode of injury depends on the risk factors prevailing in the community of the study ranging from road accident, the use of firearms, and commonest in our society is falls from heights. In some places, penetrating trauma and blunt trauma have been found about equal in aetiology of splenic rupture[2].

Nowadays splenectomy may appear easy to perform, but it has been reported to be associated with both early and late life threatening complications. The understanding of the immunological and physiological function of the spleen has lead to the use of conservative procedures for ruptured spleen. This mode of treatment is rapidly gaining popularity especially in children.

The present study has focused more on the management of traumatic ruptured spleen in adults as observed at the Department of Surgery of Muhimbili Medical Centre in a one year period (1989). Review of literature is made.

CASE REPORT

J. M., an 18 year old male patient, was admitted at Muhimbili Surgical Department an hour after being involved in a road accident. His main complaint was abdominal pain.

During the incident he had been thrown out of the car and landed on his left side of his body onto an electric pole. He didnt loose consciousness and he was able to stand and walk normally after the incidence. The abdominal pain was sharp, continuous with only short periods of relief, initially was more to the upper abdomen but gradually became generalized. It was accompanied by lower left chest pain and dizziness.

He denied history of haematuria, bleeding from the ears or nose, haemoptysis and haematemesis after the incidence. He had not been admitted of any illness before.

On examination, he was conscious and well oriented, afebrile, grossly pale and was breathing normally. His pulse rate was 108 beats per minute - regular with reduced volume and blood pressure was 100/60mmHg.

Chest examination revealed tenderness on the lower left lateral aspect, normal breath sounds and normal heart sounds.

His abdomen was not distended, it moved normally with respiration, but had generalised abdominal tenderness more marked to the left upper quadrant.

There was shifting dullness and the bowel sounds were heard normally.

Apart from few bruises he had on the anterior aspect of the right forearm, he had no associated injuries.

An impression of a blunt abdominal injury with a possible ruptured spleen was made. He was prepared for emergency explorative laparotomy. An intravenous drip of normal saline was set. Blood was taken for blood grouping and crossmatching of two units and for haematocrit estimation. A nasogastric tube was inserted for aspiration, and urethral catheter inserted for monitoring urine output. A signed consent from the patient before being taken to theatre was obtained.

Patient was subjected to general anaesthesia, and he was positioned and prepared for an upper midline abdominal incision. The abdomen was opened and the initial finding was haemoperitoneum. The blood was scouped and filtered into two prepared transfussion bottles ready for autotransfussion if indicated.

A thorough exploration for visceral damage was carried out. A ruptured spleen on its diaphragmatic surface extending to the medial surface to involve hilum was identified.

The intestines, bladder and liver were all normal, and there was no retroperitoneal haemorrhage or haematoma.

Through nasogastric tube, the stomach was decompressed further to facilitate splenectomy. The peritoneal reflection of the spleen was started from the gastroeosophageal junction inferiorly to the splenic reflection of the colon. Grasping the spleen from behind (using right hand) it was delivered into the midline wound while the other hand was compressing the splenic artery to prevent further haemorrhage. The Artery was then isolated clamped and doubly ligated using No.1/0 silk suture and then cut. The splenic vein was treated similarly. Delivery of the spleen was completed by dissection of lieno-renal, splenocolic, and gastrosplenic ligaments including ligation of small vessels and pedicles carrying the short gastric vessels by silk sutures. Finally the splenic pedicle was clamped and incised close to the hilum avoiding the tail of the pancrease, hence the spleen was now free for removal.

A warm pack was placed into the splenic bed, then retracted gradually to display bleeding sites which were then coagulated. It offered also room for final exploration for other associated injuries or presence of accessory spleen.

The pack was removed, haemostasis was achieved and the wound was closed in layers. Auto transfussion of two units of the collected blood was then commenced as crossmatched blood from the blood bank wasn't available.

He recovered well from the general anaesthesia. The postoperative orders included pethidine 100mg intramuscularly six hourly for 24 hours, intravenous infusion of dextrose/saline 3½ litres for 24 hours, and monitoring of vital signs. The nasogastric tube and the urethral catheter were removed after 24 hours. Postoperative period was uneventiful. Stitches were removed, and he was discharged home in good condition on the eighth day postoperatively. A month later he was reviewed at the surgical out patient clinic and he was found to be perfectly well.

DISCUSSION

AETIOLOGY

Blunt trauma: The spleen is the commonest internal organ to be injured in blunt abdominal or left lower thoracic cage trauma[1].

It is more likely to rupture even with trival trauma when pathologically enlarged.(1) In the present study, all patients had either blunt or crush injury. In three of the patients the injuries were severe as reflected by the following associated injuries. See table I.

Table I: Associated injuries among 20 patients with traumatic rupture of spleen

INJURY	FREQUENCY IN 20 PATIENTS
- Compound fracture distal third left femur	1
- Closed communited fracture left tibia and fibula	1
- Colles fracture right forearm	1

One of the patients - 16 year old, was hit by a stone while playing with his school mate, and at laparotomy a linear rupture of his spleen was found. As an observation most of the spleens at laparotomy were enlarged randering them susceptable to rupture after trauma.

Penetrating trauma: Occur equally to blunt trauma in societies where firearms are common[2].

In remote areas of our society, high speed missiles like arrows, spears and knives may cause penetrating splenic injury. The later is commonly used in assault cases, however it wasnt encountered in the five (25%) assaulted cases in the present study.

Latrogenic Trauma: This occurs when performing other surgical operations and this accounts for as much as 25% of splenectomies carried out for traumatic splenic rupture[1]. Same Authors commented that, the risk is less than 0.01% of laparotomies but may rise above 10% if difficult or revision surgery is performed in the left upper quadrant. However, most of these injuries are small capsular tears caused by pulling peritoneal attachments or adhesisons or by misplaced retractors.

Spleen has also been ruptured during various endoscoping procedures. In the present study, no case of splenic rupture was due to latrogenic trauma. Latrogenic splenic rupture is rarely seen in Muhimbili Surgical Department.

Spontaneous rupture: This has been reported but is rare if spleen is intrinsically normal[1]. As mentioned earlier, a trival trauma to pathologically enlarged spleen, can cause its rupture. Evaluating the above two facts some Authors believe that minimal or trival trauma preceeds spontaneous trauma. In British Isles, portal hypertension polycythaemia rubra vera and infections Monoculeasis are disorders in which spontaneous rupture is commonly seen[1].

In our society, enlarged spleen due to tropical splenomegally syndrome (TSS) and malaria is common. However, spontaneous rupture of spleen is uncommon. More studies therefore are needed to support the above theory. To patients with traumatic rupture of enlarged spleen due to malaria the injuring force was found to be considerable[4], thus contradicting the above theory.

In the present series the cause of injury was due to either blunt or crush injuries. Motor traffic accident accounted for 30% of cases, but as a single cause, fall from heights constituted the majority (35%). One fourth of the cases sustained rupture of spleen after being assulted, while the remaining 10% were due to miscellaneous causes.

Table II: CAUSES OF INJURY WHICH LEAD TO TRAUMATIC RUPTURE OF SPLEEN IN 20 CASES

CAUSE	NUMBER OF CASES	%
Motor traffic accident	6	30
Assault	5	25
Fall from height		
- table/chair	2	10
- roof	2	10
- trees	3	15
Missiles (stone)	1	5
Games (football)	1	5
TOTAL	20	100

Clinical Features:

Acute rupture of spleen:

Presence of sudden intraperitoneal haemorrhage following blunt trauma or a penetrating injury to the left upper abdominal quadrant signifies possible acute rupture. This is supported by history of abdominal pain and distension, and on examination one finds palor, increasing pulse rate hypotension shifting abdominal dullness and positive paracentesis.

Below is a table showing the common clinical features observed in the study.

TABLE III: CLINICAL FEATURES OBSERVED IN 20 CASES WITH TRAUMATIC RUPTURED SPLEEN

Symptom/Sign	Frequency in 20 patients	%
Abdominal pain	20	100
Abdominal distension	5	25
Abdominal guarding	20	100
Palor	20	100
Shifting dullness	9	45
Tachycardia (pulse 100/min)	10	50

Presence of features of external violence on the left upper abdominal quadrant or multiple rib ffactures on the left side are helpful in making of diagnosis, but are inconstant features[2].

With an exception of four patients who presented more than one day after injury the remaining 16 (80%), reported promptly after the injury especially those involved in motor traffic accidents. The diagnosis followed by explorative laparotomy were performed within 24 hours of injury.

Delayed rupture

This has been defined as haemorrhage recognised more than 48 hours after injury. The delay in some of the cases may be for hours or weeks, although in many, delay is in diagnosis making[1]. The actual incidence of delayed rupture is unknown, however, it may vary from 2-35% in reported series[1].

In the present study, 4 patients (20%) presented at varying period of two days to nine days after injury. One of them had been assaulted and the other three had fallen from different heights. At explorative laparotomy, one had traumatic leaking subcapsular haematoma while the rest had parenchymal laceration not extending or involving the splenic hilum.

Copper et al[1] commented that rupture results from the development of either a subcapsular haematoma or a post traumatic (false) cyst which then gives way at a later date.

In uncertain diagnosis after careful physical examination, where possible, angiography or radionuclide scanning is recommended[2]. The later not only has advantage of delineating the severity of splenic injury but may determine the possibility of conservative treatment.

Occult rupture: Usually it refers to intrasplenic or parasplenic haematoma passed unrecognised to organize and form pseudocysts. Splenic cysts are rare and may be congenital, degenerative, parasitic or traumatic. History of previous trauma is suggestive of traumatic cause. In the present study no such case was encountered.

INVESTIGATIONS:

i) Haematocrit and haemoglobin.

One must realize that it takes several hours for equilibration of haemoglobin and haematocrit levels to reflect significant blood losses[1]. Haemoglobin estimation is less reliable as it does not change within 24 hours until compensatory fluid shifts has taken place. Serial haematocrit estimation would indicate continuing haemorrhage.

ii) X-ray: Before laparotomy plain abdominal x-ray and chest x-ray are useful as may confirm associated injuries like fractured ribs, or pneumohaemothorax, or air under the diaphragm common in traumatic bowel perforation. However this should not delay laparotomy in rapidly deteriorating cases.

After splenectomy, postoperative x-ray is mandatory in presence of pyrexia, as minor degree of collapse of the left lobe of the lung can occur. In such cases small effusion is seen on the Chest X-ray(1).

In splenic rupture, plain abdominal X-ray may reveal obliteration of psoas shadow and in addition, subcapsular haematoma may reveal identation of gastric shadow, medial and downward displacement of colonic splenic flexure or transverse colon or elevation of the left hemidiaphragm.

iii) Angiography and Radionuclide imaging.

Where available, they offer accurate results: The later is more preferred for evaluating the severity of splenic injury and it has a lower morbidity rate(2).

Other investigations which can be used include ultrasonography and CT - scans(4).

In our circumstances, tests commonly done are haemoglobin and haematocrit, and to some, abdominal and chest x-rays. However, ultrasonography and angiography have been reserved for elective cases only.

TREATMENT

The growing knowledge of physiological and immunological functions of the spleen has alerted surgeons on the importance of conservation of splenic tissue in ruptured spleen. In childhood, splenectomy has been associated with high mortality rate due to overwhelming postsplenectomy infections.(1)

Galen,(1,5) described the spleen as an organ full of mystery that eliminated thick, earthy atrabilious humours formed in the liver. Naimonides(5,1) in 12th century emphasized the blood - purifying properties of the spleen. In the past it was believed that no one could live without a spleen. However, Aristote observed that congenital asplenic patients lead normal lives and concluded that the spleen wasn't essential of life(1).

It is unknown when the first human splenectomy was performed, though records suggest that ancients would remove spleen from athletes to improve their wind . This is most unlikely[1].

Nicholaus Mattias[6] of colberg in 1678 performed the first successful total splenectomy for a patient with history of trauma plus envisceration of the spleen. The patient recovered completely and was reported to be in good health six years after splenectomy. From thereon total excision was considered of little consequence.

During the last decades splenectomy has been used as treatment of choice for both haemolytic disorders and trauma regardless of the severity of the injury[5]. In splenic injuries Kocher[6] in 1911 recommended total excision of the spleen and provided good haemostasis was achieved no other postsplenectomy complication was expected . First warning to surgeons was by Morris and Bullock[1,6] in 1919 that was based on animal experiment. They observed that asplenic rats were more susceptible to infection and had diminished lifespan. However, not until 30 years later (1952) when King and Shumacker[1,5,6,7] reported an increased susceptibility to infection and death from sepsis in infants, following splenectomy for spherocytosis.

Overwhelming sepsis has also been reported in adults even many years after splenectomy[5,8].

The incidence of sepsis after removal of spleen for trauma (0.5 - 1%) is considerably lower than that following splenectomy for other causes (1 - 25%)[9].

Conservative and non-operative treatment

With the available knowledge on the function of the spleen and postsplenectomy complications, conservative and non-operative management for splenic injuries has formed the standard procedures in many centres especially in children[10].

K. Zucker et al[11] reported good results for the patients he managed non-operatively. They had a series of 68 patients of whom 23 were managed non-operatively, 44 underwent splenectomy and one underwent splenorrhaphy. The criteria used for non-operative therapy included haemodynamic stability, the ability to conduct frequent physical examination and a stabilized blood loss.

Buyukunal et al[12] formed special criteria for selecting those patients who would benefit from non-operative treatment that they had to have the following qualities.

- haemodynamically stable with transfussion requirements lower than 40mls/kg per 24 hours.

- Superficial and limited splenic injuries as assessed by scintigraphic and ultrasonographic examinations.

- absence of other intra-abdominal injury.

Same authors used Upadhyay and Simpson method of classification for splenic injuries for those who were subjected to laparotomy. For type I - III splenic injuries, spleen was preserved totally or partially, and in type IV injuries, splenectomy plus heterotropic splenic autotransplantation was the treatment of choice.

Type of Splenic Injury (Upadhyay and Simpson Classification[12]

Type I: Incomplete parenchymal tear

Type II: Parenchymal tear extending up to the hilus, but not dividing it.

Type III: Parenchymal tear dividing the spleen into two fragments each with an intact blood supply.

Type IV: Complete fragmentation with a torn hilar vessels.

They obtained good splenic salvage rate of 82% whereby in other series, rates of 70 - 95% have been reported. They attributed the low rate to presence of high rate of life threatening other injuries which prevented them from choosing non-operative treatment in most cases. However they recommended the use of either

prophylactic antibiotic therapy or vaccination or splenic autotransplantation for cases which necessitated splenectomy.

John et al[10] classified splenic injuries into four types almost similar to those by Upadhyay and Simpson:-

Type I: Capsular disruption without significant parenchymal injury.

Type II: Capsular disruption with parenchymal injury which did not extend into hilum.

Type III: A deep laceration that extended into the Splenic hilum.

Type IV: A spleen that was completely shattered or avulsed from its pedicle.

The management was similar to those of Buyukunal with exception of splenic autotransplantation which was not performed.

In the present study, total splenectomy was performed to eighteen patients while splenorrhaphy to the remaining two. The later had capsular disruption without significant parenchymal injury. Repair with deep no.3/0 catgut suture could have been the appropriate treatment for those with type II splenic injury, or partial splenectomy to those with type III splenic injury. However preoperatively they had been haemodynamically unstable to withstand further haemorrhage or oozing thus total splenectomy was performed. The severity of splenic injury has been classified as follows: (see table IV).

Table IV: Type of splenic injury in 20 patients with Blunt abdominal trauma.

SEVERITY OF INJURY	Number of Patients	%
- Capsular tear or haematoma	2	10
- Parenchymal laceration not extending to or involving the hilum	6	30
- Parenchymal laceration extending to hilum but hilar vessels intact	10	50
- Fragmentation of the spleen	2	10
TOTAL	20	100

Different procedures to conserve splenic tissue have been practised. Roberto et al[13] recommended implantation of splenic slices in omental pocket, when total splenectomy was unavoidable.

They reported that the procedure offered simple, safe and reasonable alternative to preserve functioning spleen. As an editorial comment, splenic autoimplants placed in subcutenous location were found to function inferiorly when compaired to those placed near the portal venous drainage, especially in an Omental location[14]. In addition, immunization with pheumococcal vaccine is required to augument the poor protection against pneumococcal chalange offered by splenic antoimplants[14].

Complications of splenectomy

- Operative Complications: A badly traumatized spleen requires quick delivery into the wound to control haemorrhage. In such circumstances it is recommended to search for the main trunk of splenic artery by identifying its branches at the hilum then tracing them back just behind the pancrease not to miss a segmental artery.

Vascular adhesions to the diaphragm and peritoneum can bleed heavily during splenectomy, this need ligation of the splenic artery at an early stage as well.

In the present study more than half of the cases (fourteen patients) at most two units of blood was scouped from the peritoneal cavity, while to the rest 350 - to 750 mls of blood was removed. Autotransfussion was carried out to 8 patients (40%) after excluding

presence of associated intra-abdominal visceral injuries.

Latrogenic injury to greater curvature of the stomach, left kidney, left lobe of the liver and tail or pancrease can occur. In the present study, none of them was encountered. No patient developed fistula owing to iatrogenic damage to the gastric wall, pancrease or colonic wall.

- Early post operative risks: Reactionary haemorrhage has been reported, however it didn't occur in the present study.

Intermittent fevers usually follow splenectomy owing to a minor degree of collapse of the left lower lobe[1]. No patient developed fever in the present series after splenectomy neither wound sepsis, thrombo-embolic phenomenon, subphrenic abscess nor pneumonia.

- Late complications

- Postsplenic infection: As mentioned earlier, an increased incidence of infection following splenectomy was first raised by Morris and Bullock in 1919[15]. This warning went unheeded for another 30 years until King and Shumacker[15] reported an increased susceptibility to infection and death from sepsis in infants following splenectomy. Nowadays the dangers of overwhelming post splenectomy infections (OPSI) are well recognised in both children and adults[16].

Its onset is sudden, the patient presents with nausea, vomiting and mental confusion; he then goes into coma and death ensues within hours of onset of symptoms[17]. Associated conditions include abdominal pain severe hypoglycaemia, disseminated intravascular coagulopathy, and electrolyte imbalance[1,17]. It has been reported that[1] 50% of cases were due to infection with streptococcus pneumonia, but neisseria meningitidis, E. Coli, Haemophilus influenzae and staphylococcus aurens have also been implicated[1,15]. "OPSI" has been thought to occur due to abscence of immunological function of the spleen following splenectomy. Buyukunal et al[12] have reported the following major changes in the immune system following splenectomy.

- decrease in the number and functions of T & B lymphocytes.
- stable low serum IgM[7] levels and temporary alteration in IgG and IgA;
- failure of filtration function and clearance of pitted cells and Howel - Jolly inclusion bodies;
- decrease in properdin levels and opsonic activity,
- decrease in complement levels (especially C_3);
- deficiency in phagotosis promoting tetrapeptide 'tuftsin'[18].

The incidence of 'OPSI' can be reduced by the use of prophylactic - antibiotics, however, this is effective against half of the organisms associated with the condition[12]. Penicillin has been recommended but has too many disadvantages including poor compliance, inadequate dosage, emergence of penicillin resistant pneumococci, and failure to cover all organisms responsible for postsplenectomy sepsis.[7] In some centre, polyvalent (serotype 14) pneumococcal vaccine is given, however though it provides significant protection it doesn't protect the individual against the other sepsis mentioned above. Likewise these patients have been reported to have impaired immune response to infection[17].

In the present study, this complication has not been encountered neither recurrent abdominal pain due to adhesions post splenectomy. Half of the patients have been followed up to sixth month postoperatively, all were perfectly well. As a remark, 'OPSI' can occur many years after splenectomy which means a long follow up thereafter. Studies are needed to determine the real incidence of overwhelming postsplectomy infection in our patients. However conservative and non-operative mode of management of traumatic splenic injury whenever applicable is adviced.

It is now understood in selected patients, non-operative management is feasable and safe, providing a careful clinical and laboratory observations are available[19]. This may however be questionable in this centre, due to lack of proper diagnostic tools.

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MALIGNANT MELANOMA

SUMMARY

In one year period (1989), five patients with malignant melanoma were managed at Muhimbili Surgical Department. Their ages ranged from 48 to 60 years. The female to male ratio was 3:2. The main presenting symptom was presence of non-healing blackish ulcer on the lower extremity whose duration ranged from 2 months to one year. All had significant enlarged inguinal lymphnodes. Chest radiography revealed ipsilateral lung metastasis in two (40%) patients who were then considered as having systemic disease.

A wide excisional biopsy of the primary lesion followed by elective groin lymph node dissection were performed in three (60%) patients. Postoperative complications were wound sepsis and tumour recurrence which were observed in one patient. The two patients with advanced disease were discharged for terminal care.

In our society the prognosis of malignant melanoma could be improved by health education towards early presentation followed by wide excision of the primary lesion and an elective regional lymph node dissection.

INTRODUCTION

Malignant Melanoma constitutes about 1% of all malignant neoplasia in USA, (1,2) and 0.9% of all deaths from cancer[3]. It has been reported to occur to both juveniles and adults. Although it is rare in patients less than 20 years of age, accounting for only 1.8% of all malignant melanoma in that age group, malignant melanoma does occur with equal aggressiveness.

A change in mole is the common presenting symptom of melanoma, for instance, in a large series of 4,545 patients with melanoma, 81% complained of change in physical characteristic of their mole in terms of either size, elevation, or colour[4]. Doglas[5], recommended that these lesions must be recognized by clinical features of growth, ulceration, bleeding, irregular border and colour pattern and should be treated aggressively in all age groups with wide local excision of the primary site and elective dissection of regional lymphnodes.

Recurrence pose a problem. It has been reported that the thickness of the tumour is a useful predictor of site and time of the first recurrence[6]. The other prognostic variables include the ulcerative state of primary lesion, and whether or not the patient underwent an elective regional lymphnode dissection as part of

the first definitive treatment(6).

Effective adjunctive therapy after surgery like adjuvant immunotherapy with BCG or chemotherapy is still on trial, however, the results are still conflicting and don't seem to alter the natural history of the disease significantly(7,2)

In this study, literature review is made and various prognostic variables have been discussed.

CASE PRESENTATION

M. S., a female patient, Age?? referred from Iringa hospital was managed at the surgical ward of Muhimbili Medical Centre. Her complaint was presence of a non healing painful black ulcer on her right foot for one year duration. The onset was gradual and it did not develop on a pre-existing skin lesion. The ulcer had been increasing in size and with on and off blood discharge. The pain in the ulcer was diffuse, continuous and dull like, localized to the right leg. Walking aggrevated pain. She had some relief through resting the affected limb. She had no pain anywhere else. She denied history of trauma or history suggestive of diabetes mellitus. She had not lost weight and she denied history of haematuria, jaundice and chronic cough. No other member of her family

had had similar lesion.

It was her first admission into a hospital. She was a housewife with five children.

The patient appeared well nourished and not in pain. She was not pale, not dyspnoeic and afebrile. Pulse rate was 78 per minute, regular and of adequate volume. Her blood pressure was 130/80 mmHg. Chest examination was normal. The liver and the spleen were not palpable. There was no abnormal mass per digital rectal examination. The rest of the examination was normal. However, she had a swollen right leg with distended vericose veins. There was an avoid blackish ulcer protruding on the lateral aspect of the middle third of the sole of the right leg. The ulcer was of 3 cm diameter and was surrounded by edematous skin. There was evidence of scanty serosanguinous discharge which was not foul smelling. The ulcer was tender, mobile and rubbery in consistence. The ipsilateral inguinal lymphnodes were enlarged. One of the largest lymphnode measured 2.5cm. in diameter and it was firm in consistance and mobile.

An impression of malignant melanoma with lymph node metastases was made. She was then prepared for a wide excisional biopsy of the ulcer. Below are the preoperative investigations which were performed.

Test	Results/report
1) Full blood picture	Normal film and distribution
	ESR - not raised
2) CXR - P/A view	No lung metastases
3) Liver ultrasound	No metastases reported
4) X-ray (R) Foot	No bone lesion

She was explained fully the natural history of her illness and agreed on the planned operative treatment. After obtaining a signed consent, she was sent to theatre.

The patient was subjected to general anaesthesia and the operation site was prepared then draped. A circular incision 5.0cm. from the ulcer margin was made sacrificing all structures up to the periosteum of the 4th and 5th metastasal bones. Excision biopsy was completed by achieving good haemostasis. The wound was packed with vaseline gauze then dressed with pressure dressings. The specimen was sent for histo-pathology. With exception of mild wound sepsis the postoperative period was uneventiful.

By the end of 3rd week postoperatively the wound had already good granulation tissue.

Elective right superficial groin lymphnode dissection was performed two weeks after the excision of the primary lesion. Under general anaesthesia a skin incision was made below and parallel to the right inguinal ligament. Dissection to gain access to the lymphnodes was carried out. Fascia lata was dissected, the saphenous vein was identified divided between clamps then transfixed with silk no.2/0. All the fat and lymphnodes lying along these vessels were removed and those at the femoral canal. The groin lymphnodes and subcutaneous fat were removed en bloc including subcutaneous fat and nodes above the inguinal ligament. After achieving good haemostasis, the wound was irrigated with warm normal saline, drain was inserted and then it was closed in two layers with interrupted chromic catgut No.2/0, then with non-absorbable interrupted matress stitches to the skin respectively.

The excised nodes and subcutaneous fat were sent for histopathology. Postoperative orders included:

Pethidine 100mg intramuscularly every 6 hrs for 24 hours

- iv infusions: Normal saline 1½ litre for 12 hours then to continue with oral fluids.
- Monitoring of vital signs.

On the 5th day postoperatively wound sepsis was noticed. Swab for culture and sensitivity tests revealed klebsiella species sensitive to gentamicin. This had been accompanied by persistent low grade fever. All stitches were removed and gentamicin course plus daily eusol dressing were prescribed. Two weeks postoperatively the sepsis had cleared, the wound was covered well with granulation tissue. Skin grafting was performed but unfortunately it didn't take. She was discharged in good condition with a referal letter for wound care plus follow up at her home hospital. The biopsy results confirmed the diagnosis of malignant melanoma with groin lymphnode metastases.

However eight months after discharge she presented with tumour recurrences at the right groin. The previous surgical groin scar had healed, but she had developed multiple blackish swellings around it some of which had started ulcerating. She had also lymphoedema of the whole right lower limb. Chest X-ray revealed multiple chest metastases. In view of the fact that the disease was already advanced she was discharged for terminal care at her nearest home hospital.

DISCUSSION

Pathology

i) Aetiology: A pre-existing pigmented lesion at the site of primary cutaneous melanoma is reported in 18 to 85% of cases[9].

Potential melanoma precursors during infancy or adolescence includes congenital nevocellular nevi (recognizable at birth) and dysplastic melanocytic nevi (recognizable during early adolescence)[9]. It has been suggested that 20 and 40% of all patients with malignant melanoma have histological evidence of an associated nevus, especially the giant congenital pigmented nevi[10]. Similarly those with small congenital nevocellular nevi have been reported to develop melanoma[9].

Dysplastic Melanocytic nevi are unique varieties of melanocytic dysplasias defined histologically by a proliferation of variably atypical melanocytes in the unit of elongated epidermal rate, one or more dermal mesenchymal changes and usually nevus cells in the dermis[9]. These lesions are characterized by very dark pigmentation of harphazard colouration (varying shades of brown, and pink), irregular or poorly demarcated borders, large size and raised or barely distorted skin surface[9]. It has been found that in patients with familial melanoma, up to 90% of those with melanoma and 40% of their relatives without melanoma had one or more dysplastic melanocystic nevi[9].

Dysplastic melanocystic nevi usually develop at the end of the first decade but can appear anytime during adulthood.

The effect of sunlight on dysplastic melanocytic nevi is unknown, but melanoma prone families with above nevi appear to have enhanced sensitivity to ultraviolet radiation compared with individuals who have sporadic melanoma or to controls without melanoma[9].

A small number of malignant melanoma arise in association with Xeroderma pigmentosum[10]. Some have been reported to develop following trauma for instance at the site of vaccination scar[10]. The precussor lesion of lentigo maligna melanoma is lentigo maligna, a lesion of elderly that occurs almost already exclusively in sun exposed areas.

ii) Classification

a) Malignant melanoma has been classified into three main types:
- lentigo maligna melanoma
- superficial spreading melanoma
- nodular carcinoma
- Acral lentiginous melanoma

b) The Clack's microstaging method categorizes different levels of invasion that reflect increasing depth of penetration into the dermal layers or subcutenous fat[10, 4]. He classified the depth according to level I to V as follows:[10]

Level I - Tumour is confined to the epidemis. Also called "severely atypical

melanocytic hyperplasia" because of its undefined pontential for metastasis.

Level II - Tumour invades but does not fill the papillary dermis.

Level III - Tumour invades through the papillary dermis to the border of reticular dermis "filling" and widening the papillary dermis.

Level IV - Tumour invades into the reticular dermis.

Level V - Tumour invades into subcutaneous fat.

The Breslow microstaging method measures the thickness of the lesion using occular micrometer to measure the total vertical height (not just the depth) of the melanoma(4).

III) Tumour spread: Malignant melanoma has two patterns or phases of growth; growth by lateral spread of the tumour within the epidermis (Horizontal growth phase), or growth by downward dermal invasion (vertical growth phase)(10). Charles(4), commented that the growth patterns of melanoma have been used to help predict the patients' clinical course. The primary nodular melanoma lesions are generally thicker and with worse prognosis than superficial spreading lesions(4).

The lentigo maligna melanoma and superficial spreading melanoma exhibit a biphasic pattern of growth with lateral spread of tumour within the epidermis folowed by dermal invarsion. Lentigo Maligna melanoma has the best prognosis(10).

Evaluation for metastatic melanoma begin with a careful history and physical examination[4]. The common sites of distant metastases are the skin, lungs, liver bone and brain[11]. The tumour has also been reported to exhibit an unusual predilection to metastasize to the gastrointestinal tract that studies have estimated the incidence at between 50% to 60%[5, 12]. Regional lymph nodes are the common sites of spread of the primary lesion in patients with cutaneous melanoma[4]. Charles et al[4], classified Clack's level 1 melanomas as melanoma in situ or atypical melanocytic hyperplasia. They commented that in contrast to invasive (malignant) melanoma they do not metastasize. Arjen[13] reported that, in 25% of patients with melanoma, metastases in the regional lymph node will occur.

In the present study, only two of the patients had previous history of pre-existing black skin patch. Two patients had lentigo maligna melanoma while the other three had nodular malignant melanoma. All the lesions were located on the lower extremity. Inguinal lymphonodes were significantly enlarged in all patients. Two of the patients had chest metastases, so they were considered as having a systemic disease.

TABLE I: SUMMARY OF CLINICAL FEATURES OF FIVE PATIENTS WITH MALIGNANT MELANOMA

PATIENT	AGE	SEX	MAIN COMPLAINT	SITE	DURATION	HISTORY OF PRE-EXISTING LESION	SIZE (ULCER) (MAX. LENTH)	METASTASES
1	57	M	Non-Healing Blackish ulcer	Plantar surface (L) leg	2 months	Yes	5 x 4cm	Let inguinal IN. No chest metastases
2	60	F	Multiple Ulcers	Proximal $\frac{1}{3}$ (L) leg	1 year	None	2 cm (diameter)	Left inguinal IN. Chest metastases
3	48	F	Non-healing Blackish Ulcer	(R) plantar (foot)		None	5 cm (diameter)	Right inguinal IN No chest metastases
4	54	F	Non-healing Blackish Ulcer	(L) foot	5 months	Yes	4 x 3cm	Left inguinal IN No chest metastases
5	49	M	Non-healing Blackish Ulcer	Proximal 2nd & 3rd toes	1 year	None	6 x 5cm	Left inguinal IN Chest metastases

CLINICAL FEATURES

The common presenting symptom is a physical change of a mole in terms of either size, elevation, or colour. 81% of patients with melanoma in Charles' series[4] presented with these complaints.

In the present study, all presented late. The main complaint in all was a non healing ulcer on the lower extremity. The duration of the ulcer ranged from two months to one year. In two patients (40%) the ulcer had developed on a pre-existing blackish skin patch while in the remaining three (60%) the ulcer developed de novo. The ulcer in four (80%) patients was solitary and black, ovoid and mobile with occational scanty blood discharge while only one patient had multiple ulcers confined to one large area. The male, female ratio was 3:2. Their age distribution ranged from 48 to 60 years. (See table I).

In many series[14,15], either women are affected more than men or equally affected. The median age of occurance in the present study was in the 5th decade of life similar to those in Charles' series[4]. As mentioned earlier the disease can affect any age group. However the mean age of occurance for lentigo maligna melanoma which occur in sun exposed areas like the face and neck is at 70 years.

All the patients in the present study presented with ulceration of the tumour. Ulceration of melanoma has been associated with a more biologically aggressive tumour[4]. Compared to malignant melanoma in Juvenile group, those in adults had higher tendency to ulcerate[5]. Ulcerative state of the primary lesion in many has been one of the major prognostic variable[6].

TREATMENT

- Excision of the primary lession:

Adam et al[16], recommended that at present, surgical therapy is the only effective (curative) treatment of melanoma; in other words the patients' only chance for cure is adequate excision of the early lesion. The dimension of excision should be determined by the thickness of the lesion[16].

For some decade, wide local excision with margins of 3 - 5cm or more has been the form of local surgery. The dimension for excision of normal skin around a melanoma (safety skin margin) has been controversal. Inadequate excision of the normal skin around the melanoma has been associated with increased chances of local recurrence especially for melanomas which have

propensity to spread laterally within the epidermis. Again small groups of tumour cells may occur adjacent to the main tumour mass in surrounding tissue (microsatellites), and if these are left behind following a narrow excision may later present as local metastases or serve as a source of distant metastases.

John[17] had the same concept of determining the safety skin margin as per tumour thickness. He reported that, for thin melanoma, conservative excision does not adversely affect the rate of recurrence of melanoma or survival of the patient. The I - to 2cm margin around the site of primary melanoma was adequate as it permitted primary closure without admitting the patient contrary to margins of 3 - 5cm which require admission then skin grafts or flap repair under general anaesthesia. In case of local recurrences, early re-excision has been recommended[17].

In the present study the three patients who had local excision of the primary lesion, the tumour thickness had been ½ to 1 cm thick. A 5cm excision margin of normal skin was excised together with the tumour. However this necessitated admission, general anaesthesia and skin grafting. Local recurrence at the primary tumour site wasn't observed. In future a longer follow up period is recommended.

TABLE II: TREATMENT SUMMARY AND BIOPSY RESULTS OF FIVE PATIENTS WITH MALIGNANT MELANOMA

CASE	SURGICAL PROCEDURE TO		BIOPSY RESULTS
	Primary lesion	Regional Lymphnode	
1.	Wide excision	Modified groin lymph node dissection	Malignant Melanoma (nodular type)
2.	Incisional biopsy	None	Lentigo Maligna Melanoma
3.	Wide excision	Modified groin lymph node dissection	Malignant Melanoma (nodular type)
4.	Wide excision	Modified groin lymph node dissection	Lentigo Maligna Melanoma
5.	Incisional biopsy	None	Malignant Melanoma (nodular type)

Primary tumour excision wasn't performed in two (40%) of the patients in the study. They had evidence of an advanced disease with chest metastases. (see table II).

- Therapeutic groin lymphnode dissection

Kumur[18] reported that 30 to 90% of all melanomas occur in the lower extremity. These were accompanied by inguinal lymphadenopathy following lymphatic spread of the tumour. However proper surgical management of these palpable and histologically positive nodes, remained debatable as status of the iliac or obturator nodes which could as well be involved remained unknown.

Fortner et al[19], reported that the survival rates for patients with positive iliac nodes were generally poor. So, he recommended total eradication and removal of the iliac and obturator nodes en bloc with the inguinal nodes. Karakousis[20] has shared the same opinion. Such a procedure forms the redical groin or ilioinguinal dissection which has been found superior to superficial groin dissection in terms of increased survival rate[13,18].

The superficial groin dissection entails the removal of the lymphnodes in the femoral triangle, the nodes above the inguinal ligament, those infront of the common femoral and superficial femoral vessels to the apex of femoral triangle and those located medially to the femoral vein including

the nodes of cloquet in the femoral canal[18].

Apart from the choice of therapeutic lymph node dissection, the other most significant determinant of survival rate for malignant melanoma is the pathologic stage of the disease[18]. The other is presence of nodal metastasis, a palpable lymphnode carrying a poorer survival rate compared to microscopically involved but clinically undetectable nodes[18].

Complications which occurred to a few patients after groin lymphnode dissection in Arjen series[13] included wound sepsis or skin edge necrosis or both, persistent seroma and severe chronic oedema.

In the present study superficial groin lymph node dissection was done to three (60%) patients only. The Author had an opportunity of evaluating one of them eight months post-operatively, she had reported back due to tumour recurrences at the previous groin dissection area. She was found to have lymphoedema of the whole of the affected limb and chest metastases as well. She was then discharged to the nearest home hospital for terminal care. The other two patients were discharged home for wound care at nearest hospital and their whereabout has

remained uncertain, similarly to the other two patients whom groin node dissection wasn't performed due to having an advanced disease. Generally our patients are presenting too late for curative treatment. All presented with ulcerative primary lesions, tumour thickness was considerable and in addition two had distant metastases. These variables are indicators of poor prognosis as mentioned earlier.

- Adjuvant therapy for Malginant Melanoma

Morton and colleagues pioneered the use of Bacillus Calmetter Guerin (BCG) in treatment of melanoma[21]. In these initial studies, the BCG therapy increased the percentage of disease - free survivors at two years from 30% to 60%[8]. Following an observation of tumour regression after intralesional injection of BCG, numerous studies of adjuvant immunotherapy following surgical resection have been carried out[21].

However, in Richards' series[8] BCG treatment didn't appear to alter the natural history of the disease. Many authors have been having dissappointing results and are not recommending the use of immunotherapy

routinely as adjuvant therapy for malignant melanoma. Further trials have been recommended. Non surgical treatment was offered to a minority of patients in Charles' series[4] reflecting the disappointing results that had been obtained in clinical trials involving chemostherapy and immunotherapy.

Effective systemic chemotherapy for malenoma has been limited to dimethyl triazeno imidazole carboxamide (DTIC)[21]. The results have been disappointing as it doesn't alter the survival rate. Similar poor results have been obtained with the use of either dicarbazine or methyl - CCNU even when they are combined with BCG[8].

Radiotherapy has been tried to regional - node bearing group of stage two patients, all with at least one positive node. It was concluded from this study that regional radiotherapy had no significant effect on either survival rate or disease free interval[21].

CONCLUSION

Early presentation and treatment of patients with cutaneous malignant melanoma has been advocated by the Author. This can be effected through health education to the public and to Health Workers who first see these patients. Those with pigmented birth marks and precussor melanocytic lesions of cutaneous melanoma since childhood should be on alert on any physical change of these lesions. If the malignant melanoma is involving the lower limb, excision of the primary lesion including an appropriate skin margin, followed by ipsilateral elective radical groin lymph node dissection is recommended. The later will further remove the iliac and obturator lymph nodes which are now considered part of the local disease - thus improving the prognosis.

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SIGMOID VOLVULUS

SUMMARY

Ten adult patients with sigmoid volvulus were managed at Muhimbili Medical Centre in a period of one year - January 1988 to December 1988. The Author participated in the management of four of the cases. All the ten patients were males of ages between fifteen and sixty years. Half of them were more than fourty five years old.

They presented with abdominal distension (100%), abdominal pain (100%) and vomiting (80%). Emergency laparotomy was performed to every patient. Sigmoid volvulus alone was evident to nine (90%) patients. The remaining patient had ileosigmoid knotting. The sigmoid colon was viable in seven (70%) patients, and gangrenous in three (30%).

Detorsion, deflation and resection of the redundant sigmoid colon was performed to eight (80%) patients. Detorsion and deflation without resection was done to two (20%). After resection, primary end to end anastomosis was performed to four (40%) patients. To the remaining four (40%); double burrel colostomy was performed in three patients and Hartman procedure in one. No death occured.

Early presentation of patients, proper history and physical examination, diagnostic investigation (radiography) and improved surgical approach have been emphasized by the author.

INTRODUCTION

Sigmoid volvulus has been recognized as an intra-abdominal catastrophe since ancient times. The Papyrus Ebers, from ancient Egypt, described the natural history of sigmoid volvulus as either spontaneous reduction or rotting of sigmoid colon[1].

In many parts of the world, sigmoid volvulus has been a common surgical emergency. In India and Russia it accounted for 30% of all intestinal obstruction[2]. In Kenya, it is the second commonest cause of intestinal obstruction[3]. Shija in 1975 commented that intestinal volvulus was rare compared to Kenya or Uganda, and that only one to four cases were seen annually at Muhimbili Medical Centre[24]. However, as an observation, more cases are seen nowadays. For instance, on the average ten cases of sigmoid volvulus are being managed at the same centre every year for the past three years.

This condition appear to be rare in Britain and USA. Gidson[4] found 58 cases of sigmoid volvulus out of 1,000 cases of intestinal obstruction in New York. Vick[5] found only 56 cases out of 6892 episodes of intestinal obstruction in British hospitals.

In Africa there has been a marked geographical distribution of this condition[6]. Shepherd reported an incidence of 20% in Kampala (Uganda), while Badoes reported an incidence of 3.7% in Ghana[7]. In Tanzania it accounts for only 4% of all cases of intestinal obstruction[24].

CASE STUDY

From January 1988 to December 1988 a total of ten patients with sigmoid volvulus were admitted at Muhimbili Medical Centre. All were males referred from nearby hospitals/Health Centres, with symptoms and signs of intestinal obstruction. Their ages ranged between 15 and 60 years. Five of them (50%) were more than 45 years old. (Table I).

TABLE I: AGE DISTRIBUTION OF 10 PATIENTS WITH SIGMOID VOLVULUS

AGE GROUP (YEARS)	NUMBER OF PATIENTS	%
Below 20	1	10
21 - 35	3	30
36 - 45	1	10
above 45	5	50
TOTAL	10	100

The duration of symptoms in two (20%) of the patients were of less than one day, while other five (50%) had symptoms for three or more days. The remaining three (30%) had symptoms for one to two days. (table II).

TABLE II: DURATION OF SYMPTOMS IN 10 PATIENTS WITH SIGMOID VOLVULUS

DAYS	NUMBER OF PATIENTS	%
Below 1	2	20
1	1	10
2	2	20
3	3	30
more than 3	2	20
TOTAL	10	100

The onset of symptoms was sudden and ranged from abdominal pain (100%) abdominal distension (100%) and vomiting (80%). Few (20%) had had similar symptoms before (see table III) which lasted for one day and three days respectively, then subsided spontenously.

TABLE III: CLINICAL FEATURES AS SEEN IN 10 PATIENTS WITH SIGMOID VOLVULUS

SYMPTOM/FEATURE	FREQUENCY	%
Abdominal pain	10	100
Abdominal distension	10	100
Vomiting	8	80
Previous episode	2	20

Clinical assessment was performed to each and below is preoperative management initiated to all at presentation:-

- intravenous infusion of normal saline alternating with 5% dextrose - 3 to 4 litres per 24 hours;
- insertion of nasogastric tube for aspiration;
- urethral catheterization;
- plain abdominal x-ray: supine and errect view and
- blood group and crossmatching of two units.

To three (30%) of the patients who had attack of short duration, emergency sigmoidoscopy and introduction of well lubricated flatus tube was attemtpted. The aim of the procedure was to relieve distension and allow reduction under direct vision. To one of them sigmoidoscopy showed a gangrenous bowel, so emergency laparotomy was performed. To the remaining two, the procedure was successful in relieving the obstruction. They were discharged to come for definitive surgery as elective cases. However, they were readmitted on the 10th and 14th day later respectively, with recurrences. Sigmoidoscopy was not attempted to the remaining seven patients.

Ultimately, emergency laparotomy had to be performed to all 10 patients to relieve intestinal obstruction. Nine patients (90%) had sigmoid volvulus alone. The remaining patients had ileosigmoid knotting. The sigmoid colon was viable in seven patients (70%) and was gangrenous in three.

The choice of surgical procedure (table IV) following emergency laparotomy was based on the condition of the patient and the operative findings. Those who remained toxic even intraoperatively but with viable large bowel, only detorsion with or without fixation was performed. Those who had good preoperative condition, and with viable non oedematous large bowel plus minimal bowel contamination intraoperatively, resection of the redundant sigmoid colon followed by primary end to end anastomosis was performed. Last catagory included those found with gangrenous sigmoid loop, resection of the gangrenous bowel followed by a colostomy procedure were done.

TABLE IV: SURGICAL PROCEDURE PERFORMED TO 10 PATIENTS WITH SIGMOID VOLVULUS

PROCEDURE	NUMBER OF PATIENTS	%
Resection plus primary anastomosis	4	40
Resection then colostomy	4	40
Detorsion with/ without fixation	2	20
TOTAL	10	100

Of the eight patients who had large bowel resection, primary end to end anastomosis was done to four (40%) while resection then colostomy to the remaining four patients (40%). Of the later group, double burrel colostomy was performed to three and Hartman procedure to one patient. The post-operative orders included the following:-

- continuation of intravenous drip: 3½ litres Normal saline, alternating with 5% dextrose per 24 hours; nasogastric tube for continuous aspiration;

- sedatives (pethidine 100mg im 6 hourly for 24 hours);
- monitoring of vital signs, input and output chart.

The postoperative period was uneventiful to all the 10 patients. Duration of hospitalization ranged from five to fifteen days. No mortality was recorded.

CASE REPORT:

R. M., a fourty eight year old male patient was admitted at Surgical Wd 11 - Muhimbili Medical Centre with complaints of abdominal pain and abdominal distension, all of three days duration.

The pain had been of gradual onset, colicky, and more marked in the whole left side of the abdomen and hypogastrium. He had no relief to change of posture. Although he had urge to pass stools he was unable to do so as it worsen the abdominal pain. On the following day, he experienced progressive abdominal distension and absolute constipation. He started to vomit on the third day of onset of his condition. It was projectile, large in amount, watery and greenish. He had vomited twice on the day of admission. He had no prior history of diarrhoea, fever or trauma. Five years back he had a similar attack which lasted for three days and improved spontaneously.

He denied history of chronic productive cough, dysuria, haematuria, increased frequency of micturation and history suggestive of mental illness. His staple food was maize meal (Ugali)with beans, spinach and occasionally fish or beef. He works as a lorry driver with Tanzania Harbours Corporation.

On examination, he appeared a middle aged patient of poor nutritional status. He was ill looking, restless and fully conscious. He was not dyspnoeic, pale dehydrated or jaundiced. He had no palpable lymphnodes. He had no peripheral oedema. His pulse was 86 per minute regular with good volume. His blood pressure was 120/80 mmHg.

The abdomen was distended more to the left side. No therapeutic marks or distended abdominal veins were evident. There were no visible peristaltic waves. He had mild guarding. The percussion note was tympanic. There was no shifting dullness. The bowel sounds were increased and were of high pitch. He had no paraumblical or inguinal hernia. Rectal examination revealed an empty rectum. He had normal chest, cardiovascular and neurological systems.

An impression of dynamic lower gut obstruction possibly due to sigmoid volvulus was made. Preoperatively he was started on intravenous fluids three litres of normal saline alternating with 5% dextrose per 24 hours. Blood was taken for serum electrolyte estimation and for

grouping and crossmatching of two units. A nasogastric tube for gastric decompression was inserted. The patient was instructed not to take anything orally. A urethral catheter was introduced and a plain abdominal X-ray supine and errect views were taken. These showed distended loop of large bowel below the left diaphragm with two air fluid levels.

On the basis of the history, physical examination and radiological findings, we came to a diagnosis of sigmoid volvulus. A decision to perform an emergency laparotomy was made. Patient was started on injection gentamicin 80mg im and Metronidazole 500mg intravenously stat. A signed consent was obtained.

In the main theatre, the patient was subjected to general anaesthesia. The abdomen was washed with savlon, iodine and spirit. He was then draped. The abdomen was opened through a left paramedian incision. The findings were those of sigmoid volvulus which had rotated one and half times round its mesocolon. The sigmoid colon was hyperaemic but viable. There was no evidence of peritonitis. Detorsion of the volvulus through 270^{o} was done. Then, a well lubricated rectal tube was inserted by an assistant through the rectum to deflate the distended sigmoid. A circular abdominal wall incision, 4cm in diameter, one third from a line joining the umblicus to anterior superior iliac spine was made. Through it the redundant sigmoid was exteriorized, thereafter the main laparotomy wound was closed in layers. Thirty centimeter of the exteriorized colon was resected and double burrel colostomy was performed.

Post operative orders included the following:-

- intravenous fluids of 2000ml normal saline and 1,500ml 5% dextrose per 24 hours.
- injection pethidine 100mg im 6 hourly for 24 hours.
- retention of nasogastric tube for continuous aspiration.
- application of colostomy bag.
- monitoring of vital signs, input and output chart.

The postoperative phase was uneventiful and the patient was discharged on the 10th day postoperatively in good condition. Elective closure of the colostomy was planned six weeks postoperatively.

DISCUSSION:

Aetiology:

Volvulus of colon results from rotation of a segment of bowel about its mesenteric axis sufficient to produce partial or complete obstruction of the lumen(8). A complete volvulus requires torsion of more than 180°. The most moderate form, commonly referred to as physiological volvulus, is a clockwise twist of 180°causing no symptoms and detorses spontaneously.

The aetiology of sigmoid volvulus however remains uncertain apart from the anatomical fact that the sigmoid colon is usually elongated and redundant with close approximation of its fixed limbs(9). In the present series no female patient was encountered. Bruusgaard(10) suggested that, in comparison to males, females have a wider pelvis and abdominal wall. The later being more relaxed after pregnancies. Thus, a loop of large bowel has more room to move about and a beginning volvulus has a greater possibility of spontaneous detorsion. Genetics may also play some role, however, these two theories need to be verified.

Megacolon and elongation of the colon can predispose the patient to volvulus formation[11]. Hirschusprungs disease[12,13,14] Chaggas disease[8], chronic constipation[1,11,14,15,16,17,18] and certain types of diet[3,19] are known to cause large colon. None of them were evident in the present study.

Pathophysiology

Sigmoid volvulus is primarily a closed loop obstruction of the sigmoid with secondary simple occlusion of the bowel proximal to the sigmoid[20]. When obstruction is partial, increased peristalsis may force gas and fluid into the closed loop which may also be forced out, giving rise to the initial rapid distension of sigmoid loop and sometimes diarrhoea respectively.

In complete obstruction the increased peristaltic activity and distension of the proximal bowel increases the intraluminal pressure considerably from the normal 2-4mmHg to 25mmHg in the Colon. If it exceeds the venous pressure, it compresses the vein with resulting venous Congestion, oedema of the wall, movement of fluids from plasma into the lumen and peritoneum. This fluid has a much higher concentration of potassium and sodium. More loss of body fluid and electrolytes occurs when vomiting supervenes hence, severe body fluid and electrolyte imbalance ensues.

Torsion of the mesentry may be severe to cause strangulation of the sigmoid. Pooling of fluids into the segment occurs, and distension with gass mainly from bacterial putrefaction of faeces is rapid and gross, so the bowel wall becomes thickened and if blood supply is cut off gangrene supervenes.

Clinical Features:

Patient will present with symptoms and signs of lower intestinal obstruction. Abdominal pain is usually hypogastric, severe and crampling, rhythmically intermittent and colicky.

The initial abdominal distension is mainly left sided but few hours later the whole abdomen is distended. Vomiting is a late symptom similarly dehydration and shock. Constipation is absolute.

Clinically, patient is not toxic in uncomplicated sigmoid volvulus. Presence of gangrene is accampained by fever, rapid weak pulse, low blood pressure and tender rigid silent abdomen.

In Ojaras'[3] series, abdominal distension was the leading symptom (60%), constipation (50%), abdominal pain (41%) and vomiting (36%). Some presented with dehydration (12%) and shock (9%). For no obvious reasons, these symptoms and signs differ from those of the present study.

In another series[1] of 16 patients with sigmoid volvulus, 93.8% of patients presented with abdominal distension, 81.3% with altered bowel habit, 50% with empty rectal ampulla, 37.5% with abdominal tenderness, 12.5% with dehydration and 6.3% with a mass.

In the above Muhimbili series, all the 10 patients presented with abdominal pain and distension (100%). Eight (80%) of them had history of having vomited, and only two had history of similar attack before. Vomiting was common in this series due to late presentation.

Supportive investigation included urgent serum electrolyte, and blood group and crossmatching.

Radiological Findings

Plain x-ray films of the abdomen (supine and errect views) reveal massive distension of the large bowel with the covexity of the distended loop lying away from the site of obstruction. Two air fluid levels are almost always seen within the sigmoid loop[10]. Friman - Dahl's sign may be present[8].

Agrez and Comeron[21], made a review of radiologic findings in twenty patients diagnosed as having sigmoid volvulus. The diagnosis was difficult to make on plain abdominal X-ray films in one third of his series. Similar problems have been noted elsewhere in the literature. A low sigmoid loop apex, distended proximal or descending colon, and accasionally a low lying transverse colon were considered the commonest cause of interpretation problems

by obscuring overlap signs and presenting convergency inferiorly. Other difficulties would arise from a small sigmoid loop or excessive fluid in the bowel and small bowel distension.

If done, barium enema would show characteristic feature called "bird beak" deformity at the site of torsion or "Mucosa spiral pattern" which is pathognomonic of volvulus. Many authors are of the opinion that this investigation is unneccessary and seldom done in acute phase(8). Apart from being time consuming it may delay treatment or further complicate the disease by causing necrosis or perforation. Thus, it should not be carried where there are signs of bowel gangrene(3).

TREATMENT

First, resuscitation is carried out with the aim of correcting fluid, electrolyte, and acid base balance disturbances. A Ryles tube is passed for gastric decompression.

Surgical exploration was considered necessary whenever sigmoid volvulus was diagnosed or even suspected during the first half of 20th Century(1). Moynihan had stated in 1905 that any mortality above 10% represented death due to delayed exploration. In 1947, Brusgaard reported 86% success rate, and mortality rate of only 9.2%. Thus depending on the condition of the patient, treatment can either be operative or non-operative.

a) Non Operative detorsion

Sigmoidoscopic detorsion is aimed at relieving the distension during the attack phase, followed later by resection of the abnormal bowel after large bowel preparation. Patient is placed in knee-albow position with a pillow under the chest to relax the abdominal muscles. A well lubricated sigmoidoscope is passed gently under vision up to a constriction (twist) indicated by spiral mucosal folds obstructing further passage of the scope (usually is at 15-25cm mark). Through it, a well lubricated flatus tube is passed gently into the distended sigmoid colon. Release of large quantity of flatus and fluid faeces with dramatic subsidence of abdominal distension occurs. The tube is stitched to the anal ring for two to three days to avoid recurrence. Sigmoidoscopic reduction is contraindicated in compound volvulus or in uncertainity of bowel viability as suggested by toxicity of the patient, late presentation, rapid pulse, pyrexia, abdominal guarding or rebound tenderness with absence of bowel sounds, and blood in the rectum. With regards to above, perforation seldom occurs but the patient has to be prepared prior for emergency laparotomy incase of failure or accidental perforation.

b) Operative detorsion

Detorsion without fixation: Alternate to the above procedure for example when compound or complicated volvulus is suspected, laparotomy is performed. An assistant guides a flatus tube from below (rectum) and often the colon is decompressed through a small paramedian incision using suction enterostomy via a 18 gauge needle (Lowdon's Manouvre). Detorsion is then done. The flatus tube is stitched to the anal verge in situ for two to three days to prevent recurrence. Definitive treatment is planned on elective basis after large bowel preparation.

Detorsion with fixation: Laparotomy is done as discussed above. Deflation is effected by flatus tube which is quided from below (rectum). Recurrance of volvulus is prevented by anchoring the redundant sigmoid colon mesocolon to the left parietal peritoneum with non-absorpable suture material. Abdomen is closed in layers as above, and definitive surgery is planned on elective basis.

c) Resection

Resection plus primary end to end anastomosis
Laparotomy through a median incision is done and resection of redundant sigmoid colon is performed. Presence of peritonitis or gangrenous sigmoid colon is a contraindication to primary end to end anastomosis. The procedure is unsuitable to patients with excessive large bowel contents or severe oedema of the bowel. Thus, patients' condition has to be good to warrant primary anastomosis since the procedure is associated with a high mortality rate. Thus, very few patients should be selected for this procedure and preferrably should be done by an experienced surgeon.

Occasionally after primary anastomosis some surgeons prefer to perform defunctioning loop (transverse colon) colostomy to protect the distal anastomotic site. It reduces the chances of mechanical breakdown of the healing anastomotic site as a result of excessive fecal load or gaseous distension in the Colon. A similar procedure was performed to one patient in the present study. Rather than performing the above procedure, the author is of the opinion of retaining an indwelling flatus tube placed proximal to anastomotic site for at least three days. Postoperatively the patient is then kept on very low residue diet for a couple of days. This equally protects the anastomotic site and eliminates possible colostomy complications, the burden of colostomy care and a second operation for the closure of colostomy. Moreover colostomies are not socially acceptable in our society.

Resection followed by colostomy: In situation when after resection of redundant sigmoid colon end to end anastomosis is contraindicated, colostomy is performed. Double burrel colostomy and the Hartman's procedure are commonly preferred. The author prefers the former for its ease in closure as it doesn't need a second laparotomy

like the Hartmans type. If properly performed, post operative complications are minimal. Of the three double burrel colostomies performed in the present study, no postoperative complications were observed and no mortality was reported.

The author suggests that, management of the patient with sigmoid volvulus should depend on the preoperative condition of the patient and on the operative findings. However, when indicated, primary end to end anastomosis should be reserved to experienced surgeon as the procedure is associated with high morbidity and mortality rate.

Mesocoplasty[23]

The long mesosigmoid is shortened and root of the mesosigmoid is broadened and mesocolic fibrous band is removed. The later provides the axis on which the sigmoid rotates. The mesocolic fibrous band which runs from the base to apex of mesosigmoid is excised longitudinally then stitched transversely with interrupted chronic catgut no.2/0. This procedure prevents recurrence of the sigmoid volvulus. It wasn't performed in the present study.

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THYROID CARCINOMA

SUMMARY

Eight patients with carcinoma of the thyroid were managed at the Department of Surgery, Muhimbili Medical Centre in a period of one and half years. (January 1988 to June 1989). The commonest complaint (50%) was fast growing anterior neck swelling. A quarter of the patients presented with pulsating scalp swellings. Half of the patients had symptoms for less that five months and the remaining half for one year.

Three patients were managed surgically, and other three by suppressive therapy as their disease was already advanced. Symptomatic treatment was given to the remaining one patient with anaplastic thyroid carcinoma. Postoperative hypocalcaemia was observed in one patient.

INTRODUCTION

Thyroid cancer is a relatively rare form of malignant disease and accounts for 0.7% of all cancers in women and 0.2% in men (1).

Several types of cancer occur in the gland and each type behaves biologically differently. This fact has a facilitating bearing on the clinical diagnosis, management and to predictable prognosis.

This study has emphasized more on those carcinomas arising from the follicular thyroid cells. Literature review has been done with bias to aetiology, diagnosis, treatment and prognosis of these carcinomas. One of the patients has been presented fully.

The pattern and management of thyroid carcinoma as seen at Muhimbili Medical Centre is presented.

CASE PRESENTATION

C.Z, a 27 year old female was admitted at Muhimbili Medical Centre - Surgical ward due to a painless anterior neck swelling of one month duration. The onset was gradual. The swelling had been growing rapidly. She denied history of difficult in breathing, change of her voice, heat intolerence bony pain, palpitation and change of bowel habit. She had normal appetite and had not lost weight. Her last menstral (normal?) period had been a week prior to the admission. This had been her first admission. For the past ten years she had been living in Dar es Salaam.

Clinically she appeared young and well nourished. She was not pale, or cyanotic, or jaundiced, and she had no generalized lymphadenopathy. She had no exophthalmos, warm wet hands or fine finger tremors. She had a normal cardiovascular examination. There was no any evidence of systemic illness. She had an anterior neck swelling which moved with swallowing. The swelling was confined more to the right side and measured 3 centimeter in diameter. Its surface was smooth and the edges were illdefined. It was hard and mobile in both the horizontal and vertical planes.

An impression of solitary cold thyroid nodule involving the right lobe was made. Radiography of the chest was normal. Full blood picture results showed normal haemoglobin concentration and normal white cell distribution. Fine needle aspiration cytology report suggested well differentiated thyroid carcinoma. On the basis of these finding a diagnosis of carcinoma of the thyroid was made and surgical treatment was adviced.

Two units of blood were crossmatched for intraoperative transfusion incase needed, and a signed consent was obtained.

The patient was given general anaesthesia. She was positioned supine with neck in extension. The site of operation was prepared and the patient was draped. A collar neck incision two finger-breadth above the sternal notch was made through the skin and platysma muscle to expose the strap muscles. The anterior thyroid veins were ligated then cut. Strap muscles on either side were retracted laterally to expose the thyroid gland. The false and true thyroid Capsule were retracted to reveal an enlarged right lobe with a solitary nodule of 2.5cm in diameter. The left thyroid lobe was normal. The right superior thyroid pedicle was identified ligated then cut. The lobe was retracted forward to expose the middle thyroid vein which was then ligated and divided. The right inferior thyroid artery was identified ligated then cut before dividing into its branches. The right recurrent laryngeal nerve was identified and preserved, same to the superior parathyroid gland. The right thyroid lobe was then extirpated including the isthmus. The entire specimen was sent for histopathology. The left lobe was left in situ. After achieving good haemostasis, the wound was closed in layers, leaving a corrugated rubber drain.

Postoperative orders included intravenous drip of dextrose saline 3½ litres per 24 hours, injection pethidine 100mg intramuscularly 6 hourly for 24 hours, close monitoring of vital signs and maintainance of input and output chart.

Postoperative period was uneventiful. The histopathology results reported papillary carcinoma of the thyroid and that the excision had been complete. Patient was discharged on the 10th day postoperatively on-L-thyroxine tablet, 100 ug daily and was instructed to attend as an outpatient twice yearly for drugs and follow up. She has already attended the clinic twice in good health with no complaints or evidence of metastases.

DISCUSSION

Incidence

Thyroid cancer is a relatively rare form of malignant disease and accounts for 0.7% of all cancers in females and 0.2% in men (1). In Africa, the incidence is yet to be determined but has been observed to vary from one region to another (2).

Follicular carcinoma of the thyroid is becoming relatively uncommon in United States (3). This has been observed after the introduction of high dietary intake of iodine and its effects in decreasing the incidence of multinodular goitre. Young (4) in his series of 1500 patients with primary thyroid cancer seen between 1947 and 1980 reported an incidence of 14%.

An increase in incidence of papillary carcinoma has been observed (5). This is marked in males but a gradual rise has also been observed in females. Papillary carcinoma is known to be associated with increased intake of iodine. In the British Isles iodinized table salt accounts for only 1.5 to 2.0% of total salt market, nevertheless it represents a sixfold increase when compared with the level in 1930.

At Mayo Clinic, Woolners (5) series of 1181 cases of carcinoma of the thyroid gland which had been followed for as long as 40 years, the incidence of papillary carcinoma was 62.3%, while that of follicular carcinoma 17.6% and 13.6% for anaplastic carcinoma (6).

Follicular carcinoma usually occur at an older age than do other forms of differentiated thyroid carcinoma[3]. In Joys' series, the overall mean age was 46.9 ± 17.5 years. Papillary carcinoma has been grouped as a tumour of young people and anaplastic carcinoma as of older age group[3].

In the present study, within a period of one and half years, 8 patients with carcinoma of thyroid were admitted and treated in the Department of Surgery, Muhimbili Medical Centre. The male to female ratio was 1:3 .

Table I: AGE DISTRIBUTION IN 8 PATIENTS WITH CARCINOMA OF THYROID GLAND

Age group (years)	Number of patients	Percentage
10 - 20	1	12.5
21 - 30	3	37.5
31 - 40	-	-
41 - 50	2	25
51 - 60	2	25
T O T A L	8	100

Half of the patients were below the age of 40 years. The youngest was 14 while the oldest was 60 years. Unexpectedly both the youngest and oldest patient had follicular carcinoma. Those with papillary carcinoma were below 30 years and the only patient with anaplastic carcinoma was 51 years old. This agrees with the findings of studies mentioned above[3,6]

PATHOPHYSIOLOGY

Thyroid gland is not one endocrine gland but two apparently functionally separate but structurally intermixed glands[1]. The larger component is composed of follicular cells, while the smaller component para-follicular cells. Therefore, primary carcinoma of the thyroid can be classified as of follicular cell origin or of parafollicular cell origin[1]. Those from the follicular cells show an unusually clear demarcation into well-differentiated with good prognosis and undifferentiated carcinoma with extremely bad prognosis.

The well-differentiated carcinomas have been divided into two broad groups on the basis of their biological behaviour. In the first group, tumour is typically multifocal and encapsulated, invades lymphatics and metastasizes characteristically to the cervical lymphnodes. At histology it may be entirely papillary or contain a follicular

component which may be dorminant. The second type, tumor is typically solitary and uncapsulated, invades veins and show predilection for bonny metastases.

The undifferentiated carcinoma derived from thyroid follicular cells have commonly been termed "anaplastic" carcinoma of the thyroid. Histological appearance is the spindle and giant cell pattern; some may be composed enitrely of spindle cells or predominantly giant cell type. Osteoid and bone formation may be seen in some. Occationally some giant cell may resemble osteoclasts and rarely a tumour is composed largely of osteoclast like, giant cells.

Tumour derived from parafollicular cell is termed "Medullary" carcinoma which accounts for only 5 - 10% of all thyroid malignancies(7). It occurs simultaneously with other endocrine tumours to form described syndromes. Example is the "Sipple Syndrome" characterized by a combination of medullary thyroid carcinoma, adrenal pheochromocytoma and hyperplasia or adenomata of the parathyroid glands. Histologically there's stromal amyloid as one of the most characteristic finding. The tumour regularly contains and secrets calcitonin. The majority tend to have a moderate or good survival although in Contrast to papillary and follicular

carcinoma the tumour is usually the eventual cause of death.

Primary sarcomas of the thyroid are exceptionally rare, except for the malignant lymphoma which may form up to 10% of all thyroid malignancies. Majority of the thyroid lymphomas are of lymphocytic type. These tumours are thought to arise in the thyroiditis as it has been shown to be associated with it.

AETIOLOGY

a) Genetic: Some cases of medullary carcinoma are familial with an autosomal dominant mode of inheritence and tends to present at an earlier age than the sporadic cases[7]. In some geographical areas, where goitre is not endemic, well-differentiated thyroid carcinoma are usually common, and genetic cause for this has been suggested. For instnace, in the North-West costal area of Norway, papillary carcinoma occurs more frequently than in any other part of the country. Until recently, this area was relatively inaccessible and inhabitants inbread[7].
In Borup Christensen[8] series from Malmo-Sweden, 4 cases of papillary carcinoma occured among first degree relatives. None had history of

previous irradiation. From the present study, no close relatives had similar problem.

b) Hormonal: Initially it was thought that prolonged thyroid stimulating hormone stimulation, was an important factor in initiating thyroid carcinoma's. Therefore, one would expect to find more cases of thyroid carcinoma in endemic goitrous areas than in non-endemic areas[9]. Studies don't support this view, however, in endemic areas the predominant histological type of thyroid carcinoma is follicular while in areas where goitre is uncommon, the papillary type. This would suggest that TSH is a primary factor in inducing follicular carcinoma of the thyroid in man. Most likely TSH also plays a secondary role in the development of irradiation induced thyroid carcinoma, and no doubt that many papillary and follicular carcinoma once established are TSH dependent[9]. Dunhil[9] in 1937 described the regression of secondary growths from papillary carcinoma when dried thyroid extracts were given to his patients. Coincidentally in the above study, two of the patients with grade III goitre for over 25 years and a third similar patient with goitre for over three years had follicular carcinoma.

c) Irradiation: In 1950, Duff and Fitzgerald[10] suggested that external irradiation was a causative factor of carcinoma of the thyroid in children. Since that time numerous studies have confirmed this observation. Evidence for this is that 18% of survivors in Hiroshima and Nagasaki, particularly those who were under the age of 10 at the time of atomic explosion of 1945, developed thyroid carcinoma which were mostly of papillary type[9]. From half to three quarters of all children in America who were found to have thyroid carcinoma had history of prior radiation to the neck delivered during the first years of life to the thymus or tonsils. The tumours were detected 10 years after the radiation exposure. The evidence that irradiation of adult thyroid cell is carcinogenic is not so convincing[19]. However, Fiona Nicol[11] commented that children and adults are equally susceptible and that the interval between irradiation and tumour development is three to thirty years. These tumours are papillary, follicular or mixed papillary follicular carcinomas frequently multicentric and bilateral[10]. No patient had history of irradiation in the above study.

d) Auto-immune thyroiditis:

A malignant lymphoma sometimes develops in a previous auto-immune thyroiditis.[10] It seems that the lymphatic tissue which develops in the thyroid gland in this condition is unusually susceptible to malignant change. In 1966, Woolner[12] reported a series of 46 malignant lymphomas treated at Mayo Clinic. Nine of his patients had histological evidence of previous auto immune thyroiditis.

PREOPERATIVE DIAGNOSIS

Usually the diagnosis is obvious once there has been extrathyroidal spread[9]. Lymphatic spread to cervical nodes as occurs in papillary, anaplastic or medullary carcinoma may be the presenting symptom. Such nodes have often been termed "lateral aberrant thyroid" previously recognized as ectopic thyroid tissue arising from a branchial arch remnant. Blood borne metastases from a follicular carcinoma may produce pulsating bone tumours, commonly in the skull, pathological fractures and secondary growths in the lung.

In the present study, half of the patients presented with rapidly growing anterior neck swelling. A quarter, presented with pulsating scalp tumours, and the remaining quarter with right neck swelling (thought to be enlarged lymphnodes) and a pathological fracture

of the right distal femur.

Table II: PRESENTING COMPLAINTS OF 8 PATIENTS WITH CARCINOMA OF THE THYROID GLAND

	Number of Patients	Percentage
Anterior neck swelling	4	50
Pulsating tumour	2	25
Others	2	25
T O T A L	8	100

The duration of symptoms ranged from one month to one year. Half of the patients had symptoms for less than 5 months, while the remaining for one year. Three quarters of the later group had bonny metastases.

Table III: DURATION OF SYMPTOMS IN EIGHT PATIENTS WITH CARCINOMA OF THYROID GLAND

DURATION IN MONTHS	NUMBER OF PATIENTS	PERCENTAGE
One	2	25
Three	2	25
Twelve	4	50
T O T A L	8	100

Thyroid carcinoma can present as solitary thyroid nodule or can arise in a multinodular goitre. Suspicion arises in presence of a rapidly growing tumour or nodule which is hard and irregular. In such circumstances other conditions like "unilateral de Quervain's thyroiditis or a unilateral Hashimotos thyroiditis have to be ruled out[9]. In the above study, solitary thyroid nodule was palpable in all patients with an exception of one.

Laboratory investigations have a limited role as most patients are euthyroid, moreover, the finding of thyroid antibodies may suggest thyroiditis. However, co-existing carcinoma cannot be excluded. Calcitonin is usually raised in medullary carcinoma. No other specific marker for thyroid carcinoma has been identified. The thyroglobulin levels are only useful in the detection of metastases or postoperative recurrencies[13]. Scintigraphy can differentiate hot (functioning) nodule from cold (non-functioning) nodules which are malignant in around 16% of cases[13]. Ultrasound can reliably delinate cystic lesion but 7% of these do habour a malignant tumour[13].

In our circumstances we need a simple and cheap diagnostic test or procedure. Fine needle aspiration biopsy (FNAB) with cytological interpretation offers a rational basis for planning operation on the basis of an accurate tissue diagnosis. It is performed to all patients presenting with solitary thyroid nodule even to simple ones as there is significant risk of

malignancy. Arthur[15] reported an overal accuracy rate for FNABx for his series as 90.2%. while Anderson[13] 98.4%, similar to the results reported by Lowhagen et al in 1981.

Despite the above results, false negative reports pose a serious limitation of FNABx. Thus its use (FNABx) as a definitive diagnostic tool is limited. Some of the false negative reports occur due to inability of the needle to obtain tissue representation of the entire mass. Often, there's difficulty in discriminating between benign follicular lesion and follicular carcinoma. However it is still a safe and useful method of increasing diagnostic ability in the evaluation of thyroid nodule. No case has been reported of seeding of cancer cell along the track of the fine needle aspiration[13] In the present study, fine needle aspiration biopsy was done to four patients. They were reported as anaplastic carcinoma, well differentiated thyroid carcinoma, follicular carcinoma and to the fourth inconclusive respectively. FNAB could not be done to two patients who presented later due to technical problem, thus diagnosis was made clinically.

Table IV: TYPE OF THYROID CARCINOMA IN 8 PATIENTS WITH CARCINOMA OF THYROID GLAND

	No. of patients	Percentage
Papillary	2	25
Follicular	5	62.5
Anaplastic	1	12.5
T O T A L	8	100

TREATMENT:

Papillary carcinoma:

Conservative and radical surgical approach are the two forms of treatment equally preferred. If clinically the opposite lobe is normal, lobectomy with excision of isthmus and pyramidal lobe is the preferred treatment in young patients with intrathyroidal tumour without gross involvement of cervical lymphnodes. "Enlarged lymphnodes are removed when they are found either at the time of initial surgery or at follow up examination[20]. The longterm survival rate remains same as that after total thyroidectomy[14,9].

Clinical recurrence in the opposite lobe has been reported in 4-7% of cases after lobectomy[13,14]. With evidence of extracapsular spread of cancer requiring enblock dissection or reoperations, radical surgical approach is preferred by some centres where total or near-total thyroidectomies are performed[3,13,14]. If deep Lymphnodes are involved, formal block dissection is seldom necessary; the involved nodes are removed individually or by modified block dissection preserving the sternomastoid muscles. Any recurrences in the lymphnodes are delt with by local excision[3,16].

In the present study one of the patients with papillary carcinoma had right thyroid lobectomy plus excision of isthmus. The other with papillary carcinoma had subtotal thyroidectomy. The later developed hypocalcaemia postoperatively probably due to vascular insufficiency to the parathyroids following surgery.

Table V: TREATMENT METHOD OF 8 PATIENTS WITH CARCINOMA OF THYROID GLAND

TREATMENT	NUMBER OF PATIENTS	PERCENTAGE
a) SURGICAL TREATMENT		
i) Lobectomy	2	25
ii) Subtotal Thyroidectomy	1	12.5
b) SUPRESSIVE/ PALLIATIVE		
i) Symptomatic + L-thyroxine	4	50
ii) Symptomatic only	1	12.5
T O T A L	8	100

Follicular carcinoma:

In minimally invasive follicular carcinoma, if the diagnosis had not been made or suspected and lobectomy for thyroid nodule has been done, it is considered adequate since multiple foci of the tumour are rare. However, in presence of multiple capsular invasion, the other lobe has to be resected or destroyed by radioiodine so that whole body scan can be carried out.

If diagnosis is known preoperatively most surgeons prefer total or near total thyroidectomy to prevent seeding of further deposits and allow radioiodine ablation of functioning secondary deposits to be carried out more efficiently[14]. Moreover, this procedure eliminates normal thyroid paranchyma which would compete for radioactive iodine.

In the present study right thyroid lobectomy was performed in only one of the five patients with follicular carcinoma. Contrary to the remaining four, the patient had presented much earlier with no bonny or pulmonary metastases. However, including those who had undergone surgical treatment, all were put on suppressive dose of thyroxine for life.

Radiotherapy for papillary and follicular carcinoma:

The only place for irradiation alone or combined with radioiodine is when complete excision of extra-thyroidal tumour has been impossible or in patients over the age of 45 years with doubtness of completeness of the excision. If excision had been complete, radiotherapy, or radioactive iodine particularly to those under 45 years is contraindicated[17].

Anaplastic carcinoma:

Attempt of total thyroidectomy which is seldom possible, is done when theres no evidence of gross extracapsular invasion or distant metastases, and is followed by irradiation. "Preoperative irradiation in the hope of rendering a tumour operable has proved valueless[18].

Only symptomatic treatment was given to the patient in the study - with anaplastic carcinoma.

PROGNOSIS

The prognosis of papillary carcinoma depends on the extent of local disease when first treated. The five year and ten year survival rates for patients aged 40 or less are 98.8% and 94.4% while those above 45 year are 86.6% and 72.8% respectively[6].

Whether cervical lymphnodes are involved has no apparent bearing on the prognosis as shown by a study in children with cervical lymphnode involvement[21].

Jay Harness[3], reported that the ultimate mortality rates of follicular carcinoma correlates directly with the degree of capsular and vascular invasion, for instance, well encapsulated follicular carcinoma with minimal angioinvasion has an excellent prognosis, whereas severely angioinvasive follicular carcinoma with distant metastases is a lethal malignancy.

To both (papillary and follicular cell carcinoma) age is a significant factor in the prognosis. Invasive tumour occur more frequently in elderly patients[3,20].

In the present study one of the patients with follicular carcinoma had presented with recurrences in the other thyroid lobe following a right thyroid lobectomy done 13 years ago for a right thyroid nodule. Clinically she appeared quite health, but radiologically, had multiple pulmonary metastases. Only the three patients who had surgical treatment do attend follow up clinics regularly, the whereabouts of the rest remains uncertain.

Anaplastic carcinomas are extremely lethal tumours and most patients are dead as a result of the tumour within a few months of presentation, even on few occations where excision of the tumour had appeared complete[14,22].

CONCLUSIONS:

1) The use of iodinized salt in endemic goitrous areas is called upon. This will prevent formation of multinodular goitre and therefore follicular carcinoma of the thyroid gland.
2) Children should not be irradiated as they may later develop thyroid carcinoma.
3) Health education should be given to the public on the importance of reporting early for treatment whenever they notice a rapidly growing anterior neck swelling. Those with multinodular goitre have to be aware of possible malignant changes which can occur with such a condition.

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PROXIMAL PRIMARY BILE DUCT CARCINOMA

SUMMARY

In a one year period (1989), four patients with primary, biliary duct carcinoma were managed at Muhimbili Medical Centre. All presented with obstructive jaundice. The sex ration was 1:1 and their ages ranged from 32 to 60 years.

The diagnosis was delayed in every case due to inadequency of diagnostic facilities. Explorative laparotomy was done to all patients. All had inoperable tumour involving the porta hepatis. Some form of decompressive procedure was performed in every case, as palliative treatment, to alliviate symptoms. One patient died before discharge, another attended follow up clinic six months after operation in stable condition. The fate of the remaining two, has been unknown after being discharged.

INTRODUCTION

Malignant obstruction at the hilar area of the liver can result from a number of causes. The most common cause is hilar Cholangic-carcinoma, (Klatskin tumour) but gallbladder carcinoma, 1^{0} or 2^{0} liver tumours or certain gastric or pancreatic cancers can also be responsible (1). Cholangiocarcinoma can occur anywhere in the biliary tree and its presentation reflects specific site and extent of the tumour occurrence (2). Its diagnosis is established after other primary sources as suggested above have been excluded. All demand relief of obstructive jaundice (1). Resection of the tumour has been advocated whenever possible (3). In such situation therefore, the objective is to relieve jaundice and pruritis. In the present study different palliative decompressive procedures are discussed. Literature review is also made followed by a discussion with bias to recent management of patient with cholangiocarcinoma.

CASE PRESENTATION

B. J. a 49 year old male patient referred from Urambo Hospital was admitted in Muhimbili Medical Centre with complaints of yellowness of eyes and puritis for the previous $3\frac{1}{2}$ months.

The onset was gradual and progressive, with yellow colouration of eyes followed two weeks later by generalized pruritis. The accompanying symptoms were nausea, excessive weight loss and general body weakness. He denied history of abdominal distension, abdominal pain and fever. He had no history of terminal haematuria, blood transfusions drug ingestion or recent coarse of injections. This was his first episode. No history of haematemesis or passage of malena stools. His stools were pale. No other member of his family had similar attack. He had not been admitted before for any major illness. He had always lived in Tabora as a peasant farmer, and had a long history of eating raw groundnuts. He rarely smoked cigarettes. He used to drink local brew only about one litre three times per week.

Clinically he appeared a middle aged patient, wasted, deeply jaundiced and afebrile. He wasn't dyspnoeic and had no generalized lymphadenopathy, but had mild oedema of the extremities. He had no flapping tremors neither spider naevi nor palmar enytherma. However, he had generalized scratch marks due to the pruritis.

The abdomen was not distended. It moved well with respiration and there was no tenderness. The liver was palpable 2 cm below the right costal margin, in the mid-clavicular line. Its surface was smooth and the margins were sharp. Spleen and the kidneys were not palpable. He had no ascites and per rectal examination no abnormality was found.

Chest, cardiovascular and other systems were found normal.

An impression of obstructive jaundice whose cause was to be determined was made. The following tests were requested.

TEST	ON ADMISSION	A DAY PRE-OPERATIVELY	TWO WEEKS AFTER OPERATION
1. LIVER FUNCTION TEST			
- Serum bilirubin (Total/umol/L Direct)	200/144	267/188	12(Total)
- Serum Alkaline Phosphatase (iu)	600	353	200
- Serum Alanine transaminase	82	76	60
- Serum Aspertate transminase	80	80	72
2. URINE TESTS			
- bilirubin	+++	+++	+
- urobilinogen	Nil	Nil	++
3. Hepatitis B surface Antigen (HBsAg)	Negative	-	-
4. X-feto Protein	Negative	-	-
5. Prothrombin time (in percentage of normal)	20	82.5	95
6. Serum creatine Level (umol/$_L$)	(not tested)	75	(not tested)

7. Ultrasound report - Gross dilatation of the intrahepatic biliary tract.

The absence of urobilinogen in urine, raised serum phosphatase and upper abdominal ultrasound findings supported further the impression of obstructive jaundice preferably extra hepatic type. Initially the prothrombin time was abnormally low, however it improved with (injection course of) vitamin K. Explorative laparotomy was adviced.

Pre-operatively, two units of X-matched blood were prepared. An explorative laparotomy was performed through Kochers incision. An extensive inoperable tumour at porta-hepatis was found with liver deposits. The gallbladder was empty, the stomach and pancrease appeared normal. A wedge biopsy of the tumour was taken and decompressive palliative procedure was done as follows: The left hepatic duct was displayed by opening the umblical fissure, elevating the base of the quadrate lobe, and lowering the left hepatic ductal system from the undersurface of the quadrate lobe. The left hepatic duct was then incised longitudinally and initial stay suture placed. The prepared roux-en-y loop of jejunum was brought up and hepatico-jejunal side to side anoastomosis was performed using interrupted vicryl suture no 3/0. Jejunal serosa was sutured to glissons' capsule with interrupted silk no. 3/0. A corrugated drain was placed into the Morisons pouch and its exit was through the right flank. The abdomen was then closed in layers.

Postoperative orders included:-

- Injection chloramphenical 500mg iv 8 hrly for 7 days.
- inj. Pethidine 100mg im 6 hourly for 24 hours.
- iv. fluids N/saline alternate with 5% Dextrose 3 litres/24 hrs.
- Monitoring of input and output chart and vital signs.

The post-operative period was uneventiful. Eight weeks post operatively, the jaundice and pruritis had subsided. Control serum bilirubin level was 12umol per 1000mls of blood. The biopsy result confirmed the diagnosis of cholangiocarcinoma. He was discharged for terminal care at nearest home hospital in a fair condition.

DISCUSSION

Pathology:

The tumour is extremely rare in childhood and most frequently occurs in patients older than 50 years with equal sex distribution[2] It can arise anywhere in the biliary tree[2], but more than half, the lesions appear in the upper third of the duct, classically at the hepatic hilus[14]. Intrahepatic tumours are usually peripheral and represent less than 25% of all primary malignant liver tumours[2].

The tumours are rock hard and gray-white with irregular infiltrating edges and multiple satellite nodules[25]. Their appearance have been linked to prognosis with polypoid lesions being more favourable than scirrhous tumours[4]. Histologically, they are adenocarcinoma, though occasionally squamous cell carcinoma is seen[4] Thus they pose significant difficult in pathologic distinction from metastatic adenocarcinoma arising in the pancrease, biliary tract and other organs[2].

In the present study, three of the four patients (75%) were above 40 years, and in all, the tumour involved mostly the upper third of the biliary tract.

Table I: AGE DISTRIBUTION OF FOUR PATIENTS WITH CHOLANGIOCARCINOMA

AGE GROUP (YEARS)	NUMBER OF PATIENTS	%
30 - 40	1	25
41 - 50	2	50
51 - 60	1	25
T O T A L	4	100

Among the aetiologic factors which have been associated with cholangiocarcinoma include sclerosing cholangitis with inflammatory bowel disease[2]. For instance, cholangiocarcinoma was diagnosed in 4 out of 45 patients with primary sclerosing cholangitis (8.9%) in Aadland series[6] Shanzuburo[2] Commented that patients with chronic ulcerative colitis have a greater risk of developing cholangiocarcinoma, usually at a younger age than usual. James[4] estimated that 3 - 11% of patients with cholangiocarcinoma have ulcerative colitis and 3% have a second intra-abdominal primary carcinoma.

A weak association exists between carcinoma and cystic disease of the biliary tract, for example coledochal cyst[24]. Cholangiocarcinoma is not associated with liver cirrhosis[5], if present, it is usually biliary cirrhosis secondary to obstruction[2]. In the present study no obvious aetiological factor was evident.

The tumour frequently extends into adjacent soft tissues and may surround or invade the portal vein or hepatic artery. Shansuburo[2] commented that vascular invasion is present in less than 20% of cases, but 70% to 75% have metastases to regional lymph nodes, liver or bone. However he pointed out the difficulties of determining tumour extent both grossly and microscopically, and that the disease may be multicentric through the biliary tree. Carcinoma of the bifurcation of the main hepatic duct usually grows and spreads slowly and has been found to have a better prognosis than their counterparts in the extrahepatic biliary system[5,8]. In the present study the tumour had involved the whole of the porta hepatis in all patients and the liver as well.

CLINICAL PRESENTATION:

Growth of the tumour is most often silent until it obstructs the flow of the bile, and nearly all patients present with obstructive jaundice[4]. Jaundice may be of acute onset and forms the main presenting symptom, however, in some patients it may develop late. Some may present with non-specific abdominal symptoms like nausea or vomiting, or symptoms of associated conditions discussed above. Half of the patients may present with vague epigastric pain and significant weight loss. As the jaundice progresses, nearly all patients would complain of pruritis.

In the present study, the initial symptom was jaundice followed shortly by pruritis in all patients. Excessive weight loss was marked in all, for instance the patient in the case presentation had lost about 15kg at presentation. One of the patients had mid-epigastric pain but he was a known peptic ulcer patient for a long duration. Three complained of recurrent nausea. All patients had pale stools.

INVESTIGATIONS:

I. Percutenous transhepatic cholangiography (PTC) has made it possible to acurately demonstrate the site and nature of obstructive lesions. Charles[12] suggested that, optimally the patient should be jaundiced for at least two weeks to permit adequate ductal dilatation.

In Dawn[9] series, it was successful in 100 out of 102 patients (98%). In another large series of more than 2,000 patients, the incidence of serious complications was only 3.4%[10]. These included bile leakage and intraperitoneal haemorrhage. Complications like arteriovenous fistula of the liver, bacteremia following infected bile entering blood directly can also occur. The above risks have been found to be less when fine needles are used (no.22 or 22.G.Chiba needle) instead of the formerly large needle for PTC (no.18 or 19G)[10]. Likewise prophylactic antibiotics preferably an aminoglycoside and penicillin before the procedure have been found to lower the incidence of bacteremia and sepsis. PTC is contraindicated in patient with reduced prothrombin time or ascites. Presence of marked distortion of interahepatic bile ducts by metastatic disease has been considere as a relative contra-indication to PTC[9].

2. Bile duct cancers can also be visualized with angiography, ultrasonograph and endoscopic retrograde cholangiopacreatography, but these studies usually do not add significantly to the information gained from PTC[4].

3. CAT (computerized-axial tomograms) is helpful in outlining extraductal extension of the tumour, metastases and subhepatic masses. In suspicion of metastatic disease, then it calls for barium studies or endoscopy of the upper gastrointestinal tract and colon. This is an attempt to find the primary site.

4. Liver function test suggests obstructive jaundice in presence of hyperbilirubinaemia, elevated serum levels of liver enzymes (ALAT and ASAT) rarely not more than 300 units, and raised serum levels of serum alkaline phosphatase[11]. Absence of urobilinogen in urine supports further the impression of obstructive jaundice.

Serum albumin and prothrombin time are indices of hepatic synthetic capacity[12]. The later has to be corrected before any surgical procedure is planned.

In the present study, the liver function test and urine test were suggestive of obstructive jaundice in all the four patients. Endoscopy to the upper gastrointestinal tract was done to one patient who was known to have peptic ulcer. This was found to be normal.

Ultrasound report had suggested features of dilatation of the intrahepatic biliary tract, contracted gallbladder, absence of stone and normal pancrease, dilated common bile duct was reported while they were not so at operation. Likewise, in none, the level or site of obstruction was reported. Liver cirrhosis was among the ultrasound report in all the four patients. CAT (computerized axial tomograms) was not done as it is not available in this hospital.

Table II: LIVER FUNCTION TEST BEFORE AND AFTER DECOMPRESSIVE PROCEDURE IN FOUR PATIENTS WITH CHOLANGIOCARCINOMA

LIVER FUNCTION TEST	PRE-OPERATIVE RESULTS				POST-OPERATIVE RESULTS			
	1	2	3	4	1	2	3	4
Serum Bilirubin -(Umol/L Total/Direct	267/ 188	200/ 144	180 138	127/ 84	12	25	87/ 52	16
Serum Alkaline phosphatase (iu)	353	600	480	484	200	220	227	398
Serum Alanine transaminase (iu)	72	82	42	32	48	38	68	69
Serum Aspertate transaminase (iu)	80	80	80	85	54	70	72	85

TREATMENT

1. Resection of the primary tumour

Complete excision of the primary lesion is only possible in less than half of the cases. If accomplished, this group enjoys the longested survival than those offered palliative treatment[4]. Flesher[13] commented that resectability rate in most series of patients with cholangiocarcinoma at hilar region is only around 10%. As experience with liver surgery has grown, the number of successful resections of bile duct cancer including a portion or all of one lobe of the liver has increased[4, 14]. Alexander et al[3] reported that patients undergoing resection for cure had a 40% adjusted 5 year survival rate, but this depended on tumour location, and differentiation. Lygidakis et al[8] obtained good results with vascular and biliary resection and reconstruction even to tumour at hepatic hilus which had been considered unresectable because of bilateral vascular and biliary involvement. The vascular resection included resection and reconstruction of portal vein and hepatic artery with the use of venograft where necessary.

None of the patients had tumour resection in the present study. The tumour was found inoperable at explorative laparotomy. All presented late.

II. HEPATIC-ENTERIC BYPASS PROCEDURES

As mentioned previously, curative surgical resection has been possible for only less than 10% of patients with malignant biliary obstruction. The remaining majority have to have some form of decompressive procedure to palliate symptoms. Selection and performance of the appropriate palliative procedure requires the best surgical judgement and skill, and the options available indicates the lack of satisfaction with any single procedure(14).

Percutaneous transhepatic biliary drainage has afforded a satisfactory alternative to surgery for palliative biliary drainage, and it can also be used to provide temporary decompression before surgery(9). The procedure was successful in 74 or 76 patients (97.4%) of Dawn's series but five of his patients (6.6%) had significant complications including one death. He suggested the following as absolute contraindications to both PTC and drainage: presence of uncorrectable bleeding diathesis, ascites, and marked distorsion of the intrahepatic bile duct by metastatic disease.

However, the clinical benefit of pre-operative decompression of the biliary tract by this procedure is still controversal. Davis et al[15] recommended neither PTC nor PTC with drainage prior to hepatico-jejunostomy for malignant obstruction as they interfere with surgical drainage. However his series constituted only 14 patients, making the sample too small for a reliable recommendation.

In the past a commonly employed procedure to restore bile flow was passage of one limb of a T-tube or similar drainage tube through the tumour[4]. Following encrustation, frequent laparotomies used to be done due to T-tube, blockage. Presently U-tube arrangments have been introduced which is easy to care by the patient alone.
Terblanche[4], who described this technique reports long-term survival particulary when it is combined with radiation therapy[13].

Traynor[1] commented that the goal of palliation in these patients with unresectable biliary tumours is the relieve of symptoms (jaundice, pruritis, malaise). The technique to be used depends on the general condition, the life expectancy of the patient, and the risk of introducing new problems into the patients life for instance external device requiring a high level

nursing care. However he accepted the absence of universally suitable palliative procedure. He recommended left intrahepatic cholangio-enteric anastomosis, using the duct of segment III (the inferolateral segment of the left liver) by round ligament approach. In his 25 years experience, the procedure was very effective for his patients.

In addition to the above technique, Blumgart[16] displayed the left hepatic duct by opening the umblical fissure, elevating the base of the guadrate lobe, and lowering the left ductal system from the undersurface of the quadrate lobe; then performed hepatico-jejunostomy as outlined in the case presentation. This method was successful in all 36 patients in his series.

III. Liver transplantation, radiation therapy and Chemotherapy

James[4] commented that, liver transplantation at present is an experimental procedure and its benefit to patients with bile duct carcinoma has been of limited value. Calve[4, 8] had disappointing results as well because all his 12 patients who had liver transplantation due to cholangiocarcinoma died of recurrent tumour within one year.

Similarly the role of radiation therapy or chemotherapy is still unclear and there is no enough data to support either of them[4].

In the present study only decompressive palliative procedures were possible-as all tumours were unresectable. However, obstructive jaundiced patients need proper work up early diagnosis and definitive treatment. Resection of the tumour should be attempted whenever possible as this group enjoys the longest survival than those offered palliative treatment.

Table III: TYPE OF DECOMPRESSIVE PROCEDURE PERFORMED TO FOUR PATIENTS WITH CHOLANGIO-CARCINOMA

PROCEDURE	NUMBER OF PATIENTS	%
T-TUBE INSERTION	3	75
HEPATICOJEJUNOSTOMY	1	25
T O T A L	4	100

One of the patients who had T-tube as palliative decompressive procedure was doing quite well sex months after the operation. One of the remaining three, died a week after insertion of the T-tube, and the remaining two, were lost for follow up. The overall prognosis

for the disease is generally poor. The median survival for those with radical resection for cure is 20 months, while those who have undergone incomplete resection followed by functional hepatice enteric bypass 7.5 months, and those whose disease was not resected 2.2 months[4]. Variations exists, for instnace, 36 months survival of a patient with unresected tumour or 960 days for six patients who had hepaticojejunostomy using a mucosal graft has been reported[4,17]. To a patient with cholangiocarcinoma relief of jaundice and most of all pruritis is a special reward.

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HYDROCEPHALUS IN CHILDHOOD

In a four months period (January - April 1990), 22 patients with hydrocephalus were managed at Muhimbili Pediatric Surgical Unit. Their main complaint was progressive enlargement of the head for a period ranging from birth to four weeks. Twenty of them were below one year of age while the remaining two, 1½ years and 7 years respectively.

Nine patients had congenital hydrocephalus and manifested with head enlargement right after birth. Four of them had associated spinal bifida cystica; one with severe neurological deficit. Ventriculoperitoneal (VP) shunt was selectively performed to five patients. Those with advanced hydrocephalus or with spinal bifida associated with double incontinence and paraplegia, a shunt procedure was not performed. One of the patients who had had V-P shunt previously, was readmitted due to V-P shunt blockage. Revision of the shunt revealed ventricular catheter blockage.

Thirteen patients were diagnosed as having acquired hydrocephalus. Three of them were premature babies who developed spontaneous progressive enlargement of the head in the neonatal period.

The remaining ten, had presented with history of persistent fever with convulsions for more than a week during their neonatal period. These were observed to have a progressive enlargement of the head two to six weeks later. V-P shunt was selectively performed to 5 patients. No shunt procedure was done to those with advanced hydrocephalus or arrested hydrocephalus. Three of the patients had been readmitted for shunt revision due to blocked V-P shunt. The ventricular catheter was found blocked in each case.

The immediate postoperative period was uneventiful. No death occured. Those with arrested hydrocephalus were discharged home and they were to attend the follow up clinic monthly, for serial head circumference measurement. Those who had a V-P shunt procedure, were discharged and instructed to attend follow up clinic after six months.

INTRODUCTION

The term hydrocephalus was for centuries associated with children who had large heads and were mentally retarded[1]. Since the advent of modern shunting devices in 1950s, their recent improvement and better surgical technique, the outlook of the condition has

changed. After a shunt procedure, the hydrocephalic children are expected to have normal sized heads and average or near average intelligence(1).

Shunt procedure is done to selected patients only, who are likely to benefit from it. For instnace, the general condition of the patient has to be good, with no other major anormalies or neurological deficit. Also the hydrocephalus has to be progressive and not advanced. The later has been a chronic problem in Muhimbili Medical Centre as most patients are presenting too late to be helped.

The aim of this study is to evaluate the management of hydrocephalus as observed at Muhimbili Paediatric Surgical Unit. Review of literature pertaining to the subject followed by recommendations have been made.

CASE STUDY

In a four months period (January to April 1989), 22 patients were admitted in the Pediatric Surgical Unit of Muhimbili Medical Centre with main complaint of progressive enlargement of the head. Two of them were neonates. The age distribution of the remaining 20 patients ranged from 1 month to seven years. Half of them were in the 1 to 3 month age group. Only two patients were more than 1 year old.
(see table 1)

TABLE I: The age distribution of 22 patients with hydrocephalus.

Age in months	Number of Patients	Percentage
Less than 1	2	9
1 - 3	11	50
4 - 6	6	27
7 - 9	1	5
10 - 12	-	-
12	2	9
TOTAL	22	100

The symptoms in half of the patients ranged between two weeks and one month. One third of the patients had symptoms for two months only. The remaining three patients had symptoms for three months each. One of the later had a non progressive hydrocephalus while the other two had advanced hydrocephalus.

Acquired hydrocephalus was evident in thirteen patients. Ten of them (95%) had a previous history of persistent fever with convulsions for more than one week. This was followed by a progressive enlargement of the head three to six weeks later. The remaining three patients in this group were premature babies. They were reported to have a previous history of enlargement of the head in the neonatal period with no prior history of fever or convulsions.

convulsions. One of them had an advanced hydrocephalus. The other two had a mild non progressive hydrocephalus and a progressive hydrocephalus respectively. A V-P shunt procedure was done to five of the thirteen patients with acquired hydrocephalus. The remaining patients had either an advanced hydrocephalus* or a non progressive hydrocephalus.

(see table II)

TABLE II: Summary of 13 patients with Acquired Hydrocephalus

Delivery inquiry/the OFC at presentation/and type of surgical procedure done	No. of patients
• Normal delivery - Full term babies	10
• Premature delivery	3
• Deviation of OFC from 50th percentile	10cm= 8 10cm= 5
• Ventriculoperitoneal shunt (V-P shunt)	5
• Revision of V-P shunt	3

OFC = Occipital - Frontal Circumference

advanced hydrocephalus* - this term has been applied when the OFC was found to deviate from the 50th percentile by more than 10cm or to those with neurological deficit, mental retardation plus mid-brain compression signs.

Nine patients had probably congenital hydrocephalus. Four of them had associated spinal bifida; one with thoracolumbar myeloschisis, advanced hydrocephalus, double incontinence and he was paraplegic as well. The second and third had lumbar spinal bifida cystica and cervical spinal bifida cystica respectively. The fourth had sacral meningomyelocele, double incontinence with no paraparesis. The later three had ventriculo-peritoneal shunt followed shortly by elective repair of the spinal bifida. The remaining five patients had a progressive enlargement of the head right after birth. One of them had been born by a caeserian section with an indication of cephalopelvic disproportion. V-P shunt was selectively done to only two of the five patients (see table III).

Four patient had been readmitted due to blockage of previously inserted V-P shunt. Three of them had acquired hydrocephalus while one had had a congenital hydrocephalus. Revision of the blocked shunts was performed to all. The ventricular catheter was found blocked in each case. It was then replaced.

TABLE III: Summary of Nine Patients with Congenital hydrocephalus.

Delivery inquiry/the OFC at presentation/and type of surgical procedure done.	No. of Patients
. Normal delivery - full term babies	8
. Operative delivery - full term baby	1
. Spinal Bifida	4
. Extent of deviation from 50th percentile:	
(OFC = CM) 10	5
10	4
. V-P shunt performed	5
. Revision of V-P shunt	1

CASE PRESENTATION

M.V., a four month old female baby was referred to the Pediatric Surgical Unit of Muhimbili Medical Centre due to a progressive enlargement of the head for one month duration. Further inquiry revealed that, she had been born normally in hospital and cried immediately after delivery. The antenatal period had been uneventiful. At the age of seven days she had high persistent fever which lasted for one week. The later, had been accompanied by frequent episodes of generalized convulsions twice every other day each lasting for a minute on the average. The frequency of convulsions had decreased gradually and disappeared

after one month. She had been treated with local herbs and with no any medical treatment. A month after the onset of his illness she was noticed to have a progressive enlargement of her head.

She had no history of cough, head injury, prolonged yellow colouration of eyes or excessive loss of weight. She had no history of refusal of breast feeds or vomiting.

She was the third born in the family and no other member of the family had similar problem or a big head. The other two children were alive and well.

Clinically the child was active, afebrile, not dyspnoeic or jaundiced or pale. She had sunset appearance of eyes. Her head was enlarged, more marked in the frontal and parietal region. The occipital - frontal circumference was 47.5cm which had deviated by 8.5cm more from the 50th percentile line of standard head circumference chart for her age. The anterior frontanelle was tense and bulging. There was obvious gaping of the suture lines. The spine was normal. She was unable to stabilize her neck. The chest examination revealed a normal respiratory system and normal first and second heart sounds with no added sounds. Abdominal examination was normal.

The muscle tone and power were within normal range and there was no hypereflexia or loss of sensation to the extremities.

A diagnosis of acquired progressive hydrocephalus was made. The child was prepared for Ventriculoperitoneal shunt. She was found to have a normal haemoglobin concentration and normal white cell count with normal cell distribution. Lumbar puncture revealed a clear cerebral-spinal fluid. Its biochemical analysis was reported as within normal limits. Culture revealed no bacterial growth.

The child was given general anaesthesia, and a V-P shunt procedure was performed. The right side of the head, neck, the chest and abdomen were washed with savlon, iodine then with spirit. The child was draped with sterile linen. A hockeystick incision to the right scalp posterior and above the right ear was made. The flap was raised and a subcutaneous tunnel to the anterior abdominal wall just to the right side of the umblicus was made. Through the tunnel a Pudenz peritoneal catheter was introduced. A cruciate incision was made on the pericranium and a burr hole made 3cm above and posterior to the postero-superior aspect of the right ear. The skull was very thin, it was nibbed to accomodate a round medium pressure Dundee Pudenz valve. Small hole was

made into the dura, though which an intraventricular catheter was introduced into the right lateral ventricle. It was connected to the proximal end of the valve. The cerebral spinal fluid was clear colourless and under pressure. The proximal end of the peritoneal catheter was connected to the valve. The whole unit was found patent when a compression pressure was applied to the valve. The distal end of the peritoneal catheter was placed into the peritoneal cavity. Both incisions were closed in one layer with nylon 5/0. Care was taken not to dress the scalp over the valve too tight. This was an attempt to avoid pressure necrosis of the scalp above the valve. Postoperative management included:-

- intramuscular injection of gentamicin 10mg bd for five days.
- intramuscular injection of Ampicillin 62.5mg 8 hourly for five days.
- Nursing in sitting position.
- Breast feeding after recovery from anaesthesia.
- Phenergan syrup 12.5mg bd for two days.
- Monitoring of vital signs.

The postoperative period was uneventiful. Stitches were removed on the seventh day postoperatively to all the two wounds.

The head size was shrinking gradually. She was discharged in good general condition to attend Pediatric Surgical outpatient clinic after one month.

DISCUSSION

Hydrocephalus is a condition in which there is an imbalance between cerebral spinal fluid (CSF) production and absorption with resultant raised intracranial pressure[1]. CSF is produced mainly by the choroid plexus of the lateral ventricles at a rate of 10 - 20mls/hr and secretion is relatively unaffected by age or changes in intracranial pressure[1]. The production of CSF is an active process[2]. After flowing through the ventricular system and subarachnoid space, the CSF is absorbed via the subarachnoid villi into the venous sinuses[1].

Non-communicating hydrocephalus is a term that refers to the type of hydrocephalus in which a block prevents CSF to escape from the ventricles into the subarachnoid space. Hydrocephalus developing in the absence of such a block is called communicating hydrocephalus.

AETIOLOGY: The causes of hydrocephalus may be either congenital or acquired and either productive or obstructive[3]. The congenital causes include x-linked acqueductal stenosis, acquiductal stenosis acquired from intrauterine viral infections and mass lesions[4]. Arnold Chiari Malformation usually associated with spinal bifida[3] and congenital absence of the foromina of Magendie and Lushka[3].

The familial sex linked recessive acqueductal stenosis mentioned above with or without other anomalies is rare but a well reported syndrome[5]. The syndrome consists of glabella portwine-nevi, agenesis of the posterior cerebellar vermis, mega cistena magna and congenital communicating hydrocephalus.[5]

Stephene[4] reported that of neonates with meningomyelocele, 80% have hydrocephalus, while those with lumbar myelocele and paraplegia, 96% have hydrocephalus.

In the present study, four patients had spinal bifida with hydrocephalus. One of them had thoracolumbar myeloschisis with severe neurological symptoms (paraplegia, double incontinence) and advanced hydrocephalus. The remaining three had spinal bifida cystica involving the cervical, lumbar and sacral spine respectively.

Five other patients had progressive enlargement of the head right after birth. They had been born normally and cried immediately after delivery with exception of one who was delivered by caeserian section following obstructed labour. The child cried after delivery but was found to have a big head.

Acquired causes have been reported to be the commonest causes of hydrocephalus[4]. It is seen after traumatic intraventricular haemorrhage, or after meningitis, or secondary to tumors, cysts and calcifications which obstruct CSF flow[4] The possible tumors include the gliomas causing obstruction to CSF flow, occational oversecretion and obstruction[3].

John et al[6] reported that, ventricular dilatation and communicating hydrocephalus following spontaneous subarachnoid haemorrhage was a well recognized phenomenon. They had studied the ventricular size in 210 patients with spontaneous sub-arachnoid haemorrhage through the cause of their illness and convalescence by means of serial computarized Tomograph scans. Delayed symptomatic ventricular enlargement (communicating hydrocephalus) occured in only 7% of the patients safely diagnosed on the basis of clinical picture and CT scan appearance. It is the

group which required a shunt system. They explained the early ventricular dilatation to be due to mechanical obstruction of the flow of CSF at the level of the exit foramina of the 4th ventricle and/or in the basal cisterns by blood clot or its organization. Blockage of arachnoid villi by red cells with subsequent impairement of absorption of CSF along superior sagital sinus has also been suggested. In chronic phase, it was explained on the basis of basal arachnoidal adhesions, the result of leptomeningeal reaction to the presence of blood products, preventing the CSF from reaching the site of its absorption[6,7].

Jan et al[8] reported that periventricular and intraventricular haemorrhage occur after birth in about 43% of all neonates with birth weight less than 1.5kg. They attributed this to haemodynamic changes in the vascular beds germinal matrix or choroid plexus that immaturity of the vascular structures and their supporting stroma and inadequency of haemostatic mechanisms in the premature newborn might have contributed to haemorrhages. The extension of haemorrhage from the ventricles into subarachnoid space leads to the same obliterative arachnoiditis resulting to progressive post haemorrhagic hydrocephalus.

Mujahid et al[9], had similar reports of periventricular and intraventricular haemorrhage occuring in 40 - 50% of infants with birth weight of less than 1,500gms or gestational age less than 35 weeks. They discouraged the trend of serial lumbar punctures. These were reported not to drain a sufficient amount of blood and blood products to prevent obliterative arachnoiditis. Moreover the posthaemorrhagic hydrocephalus was not always progressive.

Stephen[4], has reported reduction in germinal matrix - intraventricular haemorrhage in neonates following current practices, that only 2 and 5% continued to require permanent shunts.

Peacock[1] reported 4 patients in his series of 440 children treated for hydrocephalus who had sagital sinus thrombosis following middle ear infection. This interferes with CSF absorpiton, fortunately it wasn't encountered in the present study.

In the present study, three of the patients had been premature babies who were reported to have progressive enlargement of the head in the neonatal period. One of them was found to have a non progressive hydrocephalus that did not require a shunt procedure. It is a group liable to have had periventricular or intraventricular haemorrhage of prematurity discussed above.

Ten babies in the present study had history of fever followed by recurrent attacks of convulsions. They were treated locally at home with no proper diagnosis and management. Three to six weeks later, they were observed to have a progressive enlargement of the head. Most likely they could have had neonatal meningitis leading to the development of hydrocephalus due to permanent adhesions obstructing the acqueduct of silvius or outlet of the 4th ventricle or basal cisterns as its late sequale[10,11].

CLINICAL DIAGNOSIS

In younger children raised intracranial pressure produces an enlarging head and bulging frontanelle while in older children it is characterized by headache, irritability and vomiting rather than head enlargement[3,11]. The progression of head enlargement can be detected by serial occipital frontal circumference (OFC) measurement on weekly basis and comparing it with standard or local growth charts for the sex and age of the patient[3].

Mujahid[9] defined hydrocephalus as a progressive increase in ventricular size as measured by neurosonography, in association with either signs of increased intracranial pressure or an increase in head circumference more than 2cm per week for at least two weeks. Other forms of investigation includes cerebral CT scan.

The following signs were indicative of increased ICP if no other abnormality was present: episodes of apnoea and bradycardia, feeding difficulties with regurgitation and vomiting, seizures and bulging tense fontanelle associated with split sutures.

In addition to these symptoms and signs, the diagnosis was obvious in the present study because most patients presented with significant head enlargement. The OFC measurement had already deviated beyond the 50th percentile line by several centimeters. Those with a deviation of 10cm or more with neurological signs as well were considered as having an advanced hydrocephalus. Sunset appearance of eyes was evident in all patients.

MANAGEMENT

Shija[3] commented that the management of this condition depend on the causative factor, the progression and extent of the disease in relation to presence or absence of neurological deficit. The others included presence or absence of other anomalies and general condition of the patient[3]. Ethical, medical and socio-economic considerations were given priority in the management of every case. Similarly, in the present study, no shunt procedure was performed to those with arrested hydrocephalus or those with spinal bifida with double incontinence and paraplegia, or to majority of those with advanced hydrocephalus.

a) Cerebral Spinal fluid shunts

The objective of shunt procedure is to prevent or reduce impairment of cerebral development[3]. It is expected that the majority of treated hydrocephalic children will have normal sized heads and average or near average intelligence[1].

One of the widely used shunt procedure is the ventriculo-atrial shunt (VAS) with the Holter valve[3]. The other shunt procedures in use are the ventriculoperitoneal, ventriculopleural, and ventriculocisternal shunts. Other types of shunt valves in use includes the Hakim valve,[4] the Diaphragm valves, the Heyer-Schulte Miter valve and the Dundee Pudenz valve.

The V-P shunt with Dundee Pudenz - valve is the favoured shunt procedure currently in use in Muhimbili Medical Centre. This procedure was successfully performed to all the selected ten patients who required a CSF shunt procedure in the present study.

For the above valves, the opening pressures, vary with each valve but in general a "low" pressure valve requires 2 to 4cm H_2O pressure to open, a "medium" pressure valve open at 4 to 6cm of H_2O, and the normal pressure valves open at 8 to 10cm H_2O pressure[4].

The first CSF shunt to the peritoneal cavity is generally credited to Ferguson[12] who in 1898 laid a silver wire in a fistulous tract from the lumbar subarachnoid space through the body of L-5. All these earlier attempts didn't work, until 25 years ago when success was reported[13]. When the Spitz - Holter valve and suitable catheter materials became available, the technique of V-P shunting became popular. Ames[14] in 1967 introduced a peritoneal catheter with a slit valve at its tip, thereafter ventriculoperitoneal shunts have become popular for treatment of hydrocephalus.

Selection of a shunt procedure

Shunt procedures do have complications including haemorrhage, infection, shunt dysfunction and skin ulceration. In the present study shunt dysfunction was the only complication which was encountered and it occured in four patients necessitating shunt revision. Blockage involved the proximal ventricular catheter in all four patients.

Thomas[13] compaired the long term results of VAS and ventriculoperitoneal shunting for infantile hydrocephalus and preferred the later for its less life threatening complications.

Although infection of either type of shunt could lead to ventriculitis, systemic complications with contaminated VA shunt were often more severe, septicaemia often being the rule. The more indolent infection to infected VA shunt, were difficult to diagnose so they were prone to produce repeated low-grade bacteremias and renal dmage, endorcarditis and septic emboli. With VP shunts, patients would only present with distal catheter obstruction with no systemic or abdominal symptoms. The other difference between VA and VP - shunt infection was related to the continuous presence of the VA shunt catheter in the blood and thus its exposure to transient bacteremia. This accounted for the delayed VA shunt infections. Infections associated with VP shunt had been closely related to time of shunt surgery. He finally commented that the much larger number of revisions needed to maintain VA - shunt patency increased the risk of shunt infection, since each time that a shunt was exposed at operation there followed a 7% infection rate.

b) Medical Treatment

Shlomo[2] commented that morbidity and mortality from hydrocephalus has been reduced by improvements in ability to shunt cerebral-spinal fluid. However, the shunts have been associated with multiple problems like shunt obstruction requiring frequent revisions. Infections and ventriculitis was found to occur after 6 - 22% of revisions. Experimental alternative to surgical approaches have included acetazolamide, glycerol, isosorbide and head wrapping but none has been generally adopted.

Frusemide has also been tried[2]. However the previous report of management of hydrocephalus with acetazolamide and frusemide have been conflicting.

Mujahid[9] reported that several therapies had been tried in infants with intraventricular haemorrhage in attempt to prevent progressive hydrocephalus. Those aimed at decreasing CSF production, were the above two drugs, plus glycerol and insosorbide. He commented that most of these studies had been case reports or uncontrolled retrospective analyses.

Medical treatment was not given to any of the patients in the study.

RECOMMENDATION:

(1) Shunt procedures were not done to most of the patients since they had presented too late to be helped. Therefore, parents, and those attending the patients for the first time are adviced to refer them without any delays to a place where a shunt procedure can be performed.

(2) Health Education to mothers would be of value, that, a neonate with fever and convulsion if he doesn't get medical treatment, may end up with hydrocephalus. If implimented, it will reduce the cases of acquired hydrocephalus seen at Muhimbili Pediatric Ward by three quarters.

(3) Diagnostic tool like CT - scan, is of value both for definitive diagnosis and for research purposes as well. Presently its not available in Muhimbili Medical Centre. Similarly, the single available ultrasound machine is not enough for the entire centre. These are tools to be given the first priority.

(4) Studies have been called upon to evaluate the magnitude of periventricular and intraventricular haemorrhage in premature babies and those with low birth weight less

than 1,500gm in our Society with emphasis on ways of handling such group at delivery and thereafter with respect to post haemorrhagic hydrocephalus.

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OBSTRUCTIVE UPPER URINARY TRACT CALCULUS

SUMMARY

In a six month period (from January to June 1989), five patients with obstructive upper urinary tract calculi were managed at Muhimbili Urological Unit. Their age ranged between 25 and 60 years. The main presenting symptoms were flank pain in all, and dysuria in 80%. Radiography investigations were diagnostic and were supported by serum and urine biochemistry.

All patients were managed surgically and there was no major complication noted.

INTRODUCTION

Stones in the upper urinary tract are thought to occur more in industralized than non-industralized countries (1).

Its magnitude in our community is yet to be determined. Nowadays, few cases with mild to severe symptoms are being managed at Muhimbili Urological ward.

Calculi may cause renal damage by obstruction and infection, by interstitial cystitis and hypertension or by damage to the renal parenchyma during surgery for their removal. Early removal of these calculi would thus prevent sufferings and renal failure which

endangers life[2].

The recent introduction of endourological techniques for stone manipulation has revolutionized the therapeutic capabilities and offers methods of calculus extraction with minimal morbidity[3]. However, our society can't afford these expensive equipment at the moment so that where there's indication, open surgery remains the available form of treatment.

One of the patients with obstructive upper urinary tract calculus who presented in acute renal failure has been presented in details as "Case presentation". Review of literature has been made with emphasis on epidemiology, aetiology, clinical features and different forms of surgical treatment.

CASE PRESENTATION

LBD, a 47 year old male patient from Upanga Dar es Salaam, ethnic Goa, presented with right sided flank pain and failure to pass urine for 12 hours. The loin pain had been bilateral for a long duration, diffuse and intermittent with a long duration of relief. However on admission the pain had been persistent for 12 hours and more on the right side. Rest, gave him mild relief. He had nausea and urge to pass urine though he could not void.

Occasionally, he used to have increased frequency of micturation throughout the day. He denied history of haematuria, vomiting and diarhoea. He had similar attack 20 years ago for which a right nephrolithotomy was performed. The postoperative period had been uneventiful. He had no close relative with similar problem. He was a petty businessman. He used to smoke on the average 20 cigaretes per day, also, he had never taken alcohol in his life.

Clinically he appeared ill looking, febrile with a body temperature of 38.1° Centigrade. He was not dehydrated, dysphoeic or jaundiced. He had no peripheral oedema or flapping tremors or distended neck veins. He had no palpable anterior neck nodule. The cervical, axillary and groin lymphnodes were not palpable. The blood pressure was 120/80 mmHg and pulse 84 beats per minute, regular and of good volume.

The abdomen was not distended. He had bilateral renal angle tenderness more marked on the right side. The liver and spleen were not palpable. There was no ascites. The prastate was normal and the bladder was not distended on per rectal examination. Respiratory examination was normal.

First and the second heart sounds were clearly heard with no added sounds. Muscloskeletal system was normal. There was no evidence of neurological deficit.

The patient was catheterized. No urine was obtained. An impression of acute renal failure secondary to obstructive uropathy was made. Urgent serum electrolytes (Potassium and Sodium), creatinine and urea were requested. Serum calcium and a plain X-ray of the abdomen were also requested. He was started on parenteral ampicillin 250mg 6 hourly and frusemide 120mg intravenously stat. Strict monitoring of his fluids - input and output was recommended.

The above serum biochemical test result reported as follows: (in mmol/L).

	K^+	Na^+	Creatinine(umol/L)
(Normal values	3.8 - 5.2	136-149	55-125)
- On admission	4.1	120	239
- 12hrs post admission	5.0	116	434
- 24hrs post admission	5.0	116	552
- Post haemo-dialysis	3.7	127	474

Progress of the patient: His general condition for the first 24 hours after admission was deteriorating gradually. The abdominal pain and renal tenderness had increased, however the patient was still conscious with stable vital signs and had no neurological deficit. Despite a fluid intake of 2000mls per 24 hours, his urine output was only 100mls per 24 hours. Both the serum potassium (5.0mmol/L) and creatinine (552 umol/l) levels, were increasing rapidly to toxic levels. Serum Calcium level was reported as within normal limits (2.45 mmol per litre). An IVU using a larger dose contrast media was requested.

The radiological investigation report was as follows:

KUB: Bilateral renal calculi.

IVU: Bilateral staghorn calculi. No hydronephrosis.

An urgent haemodialysis was performed. The post dialysis biochemical picture reported normal serum potassium (3.7 mmol) and low serum sodium (127 mmol/L) levels but serum creatinine (474 umol/L) was still raised. He was then prepared for emergency right pyelolithotomy in attempt of removing the obstruction to prevent further kidney damage. Another preoperative plain abdominal x-ray was taken.

Operation details: Patient was subjected to general anaesthesia. He was then positioned in a "flexed lateral decubitus position". Operation site was prepared then draped, and a 12th rib - tip approach" technique was performed to expose the right kidney. The first step included a short incision on the tip of 12th rib which was extended through the fat and the overlying latissmus dorsi to expose the anterior 3 - 4 centimeters of the rib. With the use of diathermy, a line midway to the anterior surface of the rib was made, then with the help of periosteal elevator the periosteum was stripped off forwards, towards the tip of 12th rib hence, the attached intercostal muscle. The rib was then resected.

A small gap through the inner periosteum revealed prerenal fat so, by identifying and avoiding subcostal neurovascular bundles, the incision was prolonged anteriorly to expose the prerenal fat. Gerotas fascia was identified, opened to expose a medium size kidney. There were adhesions posteriorly, so the renal pelvis was reached with difficulty. Ureter was identified so the renal palvis which was then opened longitudinally through a 1.5cm incision. Milk like coloured infected urine with some friable necrotic tissues came out. The

stone was not immediately evident in the renal pelvis. With the help of a needle, a stone possibly in the calix extending into the renal parenchyma and renal pelvis with obstructive element to the later was evident. The renal parenchyma over the stone was very thin.

A deliberate 3.0cm, incision made at right angle to the convex border of the kidney, extending deep into renal parenchyma was made. With the help of stone forceps, an irregular solid stone of 2.5 centimeter in diameter plus two other fragments of 0.5 and 0.8cm diameter respectively were removed. Through the renal pelvis incision, the ureter was flashed with normal saline with the use of small catheter which was then removed and the incision closed with interrupted chronic catgut 3/0. Through a separate skin incision nephrostomy tube (folley catheter no.20) was introduced into the renal pelvis through the kidney incision. Its baloon was inflated mildly to fix it. A rubber drain was inserted into renal bed by using a separate skin incision. Wound was then closed in layers, skin by interrupted non-absorpable suture. Urethral catheter was introduced and urinary bag applied to both the nephrostomy tube and urethral catheters.

Post operative period: He had a good post anaesthesia recovery. The preoperative orders were continued postoperatively with emphasis to strict monitoring of vital signs, input and output chart plus serial serum electrolytes and creatinine.

24 hours postoperatively the vital signs were normal and stable. The serum electrolytes test, showed normal levels of potassium (3.5mmol/L), sodium (130mmol/L) but serum creatinine (415 mmol/L) was still raised. Total fluid input had been 2,300mls and output 2,100mls of urine; 600mls from the urethral catheter and 1500mls from nephrostomy tube.

At 11th day postoperatively, he had already normal fluid intake and output, and normal serum biochemistry; potassium = 4.0mmol/L, sodium = 139mmol/L and creatinine level was 84umol/L.

Throughout the post operative period urine had been clear. For two weeks postoperatively most urine had been through nephrostomy tube, however it reversed gradually so that by the end of second month all urine came through the urethral catheter.

Towards the end of first week after operation he had pyelonephritis with persistent fever, so he was given systemic antibiotics as per midstream urine culture and sensitivity test results. At the end of the second month postoperatively he had been in good condition. The urethral catheter and nephrostomy

tube were removed and patient was able to void normally. Control plain abdominal X-ray showed renal calculi in the left kidney and there was no stone on the operated right side. He was discharged home to attend Urology follow up clinic after three weeks. Future plan was to perform another procedure to remove the stone in the other (left) kidney so as to salvage both kidneys.

DISCUSSION

EPIDEMIOLOGY OF STONE DISEASE

In most countries the information available on renal stone epidemiology is based on an analysis of cases which present at the hospital[4]. However the number of cases actually present in a community may be very different from those which present clinically.

Kitonyis'[5] Series of retrospective review of 1453 excretion performed at Kenyatta National Hospital between January 1982 and December 1984 revealed 26 cases (3.9%) with urolithiasis of which 14(63.6%) were confined to the upper urinary tract. He called for more comprehensive study to determine the true incidence of renal calculosis. However in depth studies have been done in South Africa[4] in relation to incidences in different racial groups. In Bantus the disease is rare and it was speculated to be due to their diet which results to reduced urinary

phosphate and calcium excretion. In Sudan vesical calculi is a major problem, however the prevalence of upper tract stone disease is increasing.

It has been estimated that more than one person per 1,000 suffers from stone disease in United States of America compared to 0.2 to 0.5 per 1,000 in Mediterranean Countries[6]. Recently, the incidence throughout the USA has been reported to be 1.6 per 1,000[7]. A collaborative study on incidence of renal stone in 18 British Towns by Powder et al[1] reported that the incidence was higher in Towns with better social economic conditions and in comparison climatic factor, latitude and water hardness were not important determinants of the distribution of renal stones. The same survey showed no consistent trend between rates among men aged 15 to 64 years.

The general opinion from crossectional studies has been that there is a peak incidence around the age of 40 with a decline thereafter. However, Ljunghal's et al[8] series, demonstrated that for individual, the risk is not reduced until 60 years of age.

In the present study most patients were of the age between 35 and 55 years. The youngest was 25 years old. Male to female ratio was 3:2 contrary

to those of Gupta et al[10] or Charles[7] but close to those reported by Royce et al[19] 3:1, while Kitony[5] reported a male preponderance in Kenya.

AETIOLOGY AND MECHANISM FOR STONE FORMATION

In USA, calcium urolithiasis constitutes 70 to 80% of the total incidence of urolithiasis[12], while majority of the remaining are uric acid and cystine stones.

The cause of calcium stone disease is multifactorial, and therefore no single underlying disorder can be implicated in all instances. Less than 5% of the patients have a defined pathologic condition for instance, renal tubular acidosis, primary hyperparathyroidism, sarcoidosis or inflammatory bowel disease while the rest have no obvious aetiologic factor.

Hypercalciuria or hyperuricosuria alone or in combination are two metabolic disorders commonly implicated in the pathogenesis of stone disease Other suggested are hyperoxaluria, hypomagnesiuria and hypocitraturia. Hypercalciuria could arise as a result of increased intestinal calcium absorption whose mechanism doesn't depend on the usual activated vitamin D. The other cause is renal hypercalcuria where there's a

primary renal leak of calcium plus persistent stimulation of parathyroidhormone (PTH)[12].

Hyperuricosuria could result after increased intake of dietary purines (fish, meat, poultry) or excessive endogenous purine metabolism. Uric acid or monosodium urate crystals may act as nidus for calcium oxalate crystal deposition, or may decrease the inhibitory potential of naturally occurring crystal growth inhibitors particularly the glycosaminoglycans. These stones differ from other stone subgroups in that they occur at a later average age.

Hyperoxaluria is seen in patients with malabsorption or who have undergone a jejunal ileal bypass but with intact colon. In these circumstances there's increased intestinal absorption of oxalates following inavailability of calcium which binds it in the gut. 7 - 10% of these patients will have kidney stone[12].

Other predisposing factors include presence of foreign body for instance non-absorpable material post urinary tract surgical procedure, this will act as a nucleus around which precipitation of supersaturated calcium salt occur. Urinary tract infection and urinary stasis predispose to stone formation by altering the pH of urine, also the protective colloids of the urine or by causing

disquamation of the epithelium which acts as nucleus with its sequele above.

In the present study, four of the patients belonged to a higher - social economic group and were clinically obese. Power[1] had reported an increased incidence of renal stone disease in such groups and possibly is related to diet. Two had relapse after previous surgical removal of upper urinary tract calculi. None had a close relative with similar illness. Stone biochemistry revealed calcium oxalate only in 3 (60%) patients and calcium phosphate in one. (See table I below).

Table I: STONE BIOCHEMICAL ANALYSIS IN 4 PATIENTS WITH UPPER URINARY TRACT CALCULI

PATIENTS	TYPE OF STONE
1 (535291)	Calcium oxalate
2 (475579)	Calcium phosphate
3 (553505)	Calcium oxalate
4 (565760)	Calcium oxalate

Remark: In one patient, biochemical study of the stone was not done.

CLINICAL FEATURES

Patients may present with any one or a combination of symptom complexes: pain, severity and site being dependent on the location and effect of the calculus, systemic or local symptoms of infection including fever, chills, frequency, dysuria, urgency and pain; haematuria; anuria, if complete obstruction of the only functioning or of both kidneys develops; or uremia[22]. The signs in uncomplicated cases are minimal with only renal angle tenderness or muscle spasm with guarding over the site of ureteric calculi. The signs are evident when there's infection or obstruction.

In the present study many patients had more than one symptom, the commonest being flank pain (100%) and dysuria (80%). The signs and symptoms on admission are shown in table II.

Table II: SYMPTOMS AND SIGNS IN 5 PATIENTS WITH UPPER URINARY CALCULI

SYMPTOMS AND SIGNS	FREQUENCY	%
Loin pain	5	100
Haematuria	2	40
Dysuria	4	80
Nausea and vomiting	3	60
Anuria	1	20
Hypertension	3	60
Renal angle tenderness	5	100

One patient was anuric for 12 hours on admission and has been presented fully as a "case presentation" above. Singh et al[10] reported flank pain and dysuria to be the commonest presenting symptoms for their series as well.

INVESTIGATIONS: Where available and when there's obstruction ultrasound can detect the calculi easily, also it is less costly than radiographic tests, however the incidence of false negative is fairly high[15]. The others include plain abdominal X-ray (KUB) to show and locate radiopaque urinary calculi. Renal function

tests are then requested (see table III and IV) followed by an intravenous urogram (IVU) which provides a rough assessment of renal function, position, size and number of stone, but also the position of the renal pelvis in relation to the lumbar spine and ribs[11]. For radiolucent calculi, echogram, CT scans, and retrograde pyelograms are helpful in this overal assessment of size, position and number of stones[11].

The report on KUB and IVU for the present study is available in table VI. Three patients had Ureteric calculi. One of the patients had unilateral renal calculi and a contralateral ureteric calculi. The patient with bilateral staghorn calculi who was anuric for 12 hours is the one presented as "case presentation".

Table III: SERIAL SERUM CREATININE (IN MMOL/L) OF FIVE PATIENTS WITH UPPER URINARY TRACT CALCULI

PATIENT	ON ADMISSION	MAXIMUM RECORDED	AT DISCHARGE
1 (535291)	92	107	87
2 (531571)	109	115	96
3 (475579)	134	137	107
4 (553505)	107	120	98
5 (565766)	239	552	84

Remarks: With an exception of the patient who presented in

acute on chronic renal failure, (see case presentation) the serum electrolytes of the remaining four patients was reported to have normal sodium and potassium levels.

Table IV: OTHER SERUM BIOCHEMICAL TESTS OF FIVE PATIENTS WITH UPPER URINARY TRACT CALCULI: (MMOL/L)

PATIENT	CALCIUM	PHOSPHATES	URIC ACID
(normal values	2.15-2.65	0.8-1.4	0.1-0.4)
1. (535291)	2.60	1.02	0.63
2. (531571)	2.25	0.56	0.30
3. (475579)	2.45	0.80	0.52
4. (553505)	2.50	1.00	0.40
5. (565766)	2.34	1.08	0.40

Table V: URINE BIOCHEMICAL TESTS OF FIVE PATIENTS WITH UPPER URINARY TRACT CALCULI (MMOL/L)

PATIENT	CALCIUM	PHOSPHATE	URIC ACID
(Normal values	5.0	30	3.0)
1. (535291)	4.0	40	2.2
2. (531571)	5.6	45	2.0
3. (475579)	3.2	35	2.5
4. (553505)	6.0	28	1.5
5. (565766)	6.0	25	3.0

Table VI: KUB AND IVU REPORT OF FIVE PATIENTS WITH UPPER URINARY TRACT CALCULI

PATIENT	KUB REPORT	IVU REPORT
1. (535291)	Opacity left 4th-lumbar transverse process. Lateral film: mid ureteric stone.	left ureteric with unilateral hydronephrosis and hydro-ureter.
2. (531571)	Large opacity over the right sacrum close to sacroiliac joint.	Right vesico-ureteric junction calculi, with partial obstruction hydronephrosis and hydroureter.
3. (475579)	Right renal opacity	Stone at lower pole of the kidney and at the left mid-ureter.
4. (553505)	Left renal irregular large calculi	Staghorn calculi left renal pelvis.
5. (565766)	Bilateral renal stone	Bilateral staghorn calculi.

Other significant tests are urinalysis and mid stream urine for culture and sensitivity test which may indicate haematuria and urinary tract infection respectively. Thus in presence of infection, treatment course as per sensitivity tests has to be given to clear the infection prior to surgery.

The determinants of urinary stones for instance, urinary calcium, oxalate, pH and uric which may interfere with urinary inhibitory activity are all determined[13]. Thus a 24 hour urine sample is collected for the mentioned biochemical tests for every patient (see table V). Berg et al[14] reported better results with 4 hour than 24 hour urine sample in some patients. They reported the difficulties of urine collection and the associated sequales of its storage. For instance, bacterial contamination alters the composition of urine also storage alters the urinary pH. Thus they called for more studies with 4 hour urine samples for demonstrating its value in evaluation and follow up of calcium oxalate stone formers.

In the above study, the 24 hour urine sample biochemistry reports were nearly all within normal limits, same to serum calcium, phosphorus and uric acid levels. Likewise, urography (IVU) formed the

standard method for evaluating the obstructed urinary tract. It is a test with greater accuracy and with ability to access renal function[15].

TREATMENT

Open operative and none operative intervention are two forms of surgical treatment for the removal of upper urinary tract calculus.

The birth of modern renal surgery occurred on August 2nd 1869 when Gustave Simon[11] of Heidelberg removed the kidney of a patient suffering from ureterocutaneous fistula. Together with the invention of radiolographic studies and better surgical technique the morbidity and mortality of renal surgery has been lowered.

Preoperatively all investigations discussed earlier have to be done and presence of urinary tract infection cleared before surgery. Those who have slipped into varying degrees of renal insufficiency or failure should have detailed preoperative assessments', correction of the underlying biochemical abnormalities, appropriate radiological investigations and the use of dialysis before surgery[2]. Following this method Singh et al[1] was able to improve renal function in 86% of patients with renal failure in his series. Those with acute and acute on chronic renal failure improved to nearly normal and remained

so on follow up.

The operative procedures available for the management of upper urinary tract calculi, include pyelolithotomy, nephrolithotomy, pyelonephrolithotomy, ureterolithotomy and partial nephrectomy(20).

-Pyelolithotomy: is indicated for a small calculus in the extrarenal pelvis and those which can be disloged fom the calices into the renal pelvis. After removal of the stone, the renal pelvis is irrigated with normal saline solution and suction of pelvis and calices performed to remove any remaining stone fragment. It is advisable to flush the ureter as well with normal saline by introducing through it a small ureteric catheter. If the kidney had been uninfected and at operation no evidence of infection then the pyelotomy is closed by 4/0 plain catgut.

-Nephrolithotomy: This is performed for a stone impacted into calix or when approach to the pelvis is difficult in the presence of adhesions. The incision is made at right angle to the convex border of the kidney to maintain vascular intergrity. Bleeding point is tied with chromic catgut 4/0.

- Pyelonephrolithotomy: Is a procedure for the removal of difficult staghorn stone which cannot be delivered completely by pyelolithotomy. Mobilization of the kidney is necessary first to permit control over the pedicle in unexpected bleeding. Those large ones which extend beyond caliceal neck are best removed by nephrolithotomy rather than forcing them through the caliceal neck, as this may cause serious bleeding following tear of segmental veins which run around the neck[20].

- Partial Nephrectomy: May be the operation of choice for stones in the inferior calix associated with partial hydronephrosis or hydrocalicosis, especially if the other kidney has already been removed or is functionless[20]. Presence of calcifications in areas of the kidney other than in the pole to be removed makes this procedure uneffective[20]. Thus in selecting patients, those with such renal calcifications won't benefit from this procedure as they are likely to form new calculi to the remaining kidney after partial nephrectomy[20].

- Nephrectomy: Nephrectomy for calculus disease is indicated when there is associated gross obstruction or infection leading to dense fibrous perinephric adhesions. The other kidney should have satisfactory function before above procedure is planned.

  Nephrectomy may be indicated for:-

  - Calculus pyonephrosis and hydronephrosis prolonged and severe pyelonephritis even after pyelolithotomy plus antibiotic therapy.
  - Severe uncontrollable haemorrhage during renal lithotomy.
  - urinary fistulae with prolonged suppuration and sinuses.
  - Malgnancy associated with stone.

- Ureterolithotomy: Is the surgical removal of ureteric stone. Before it is performed, chronic disorders such as diabetes mellitus or malnutrition should be treated as they impair wound healing and the immune response.

  Asymptomatic non obstructing stones in an elderly is best managed expectantly as surgery in this group is associated with postoperative complications. Similarly, non-obstructing uric acid stones are first managed by disolving them by alkalinization either by oral administration of sodium bicarbonate or sodium lactate. Infections should be cleared

by appropriate antibiotics as advocated earlier. Lastly, it has to be remembered that the proximal stones are less likely to pass sponteneously than the distal located stones, especially if they are more than 8mm in diameter or with irregular shapes. As will be discussed, the surgical approach to the ureter extraperitoneally will depend on the site of the calculus.

Surgical approach to Upper Urinary tract calculi

Basic approaches to renal calculus surgery include anterior (extra-or transperitoneal), lateral (supra-or subcostal), and posterior (prone or lateral decubitus)[11]. Anterior approach is considered when scarring is anticipated following previous flank surgical approaches or for simultaneous removal of bilateral calculi. The lateral approach in which neither the peritoneal nor thoracic cavity need to be entered, is the commonest and it includes the classical subcostal incision, a 12th rib-resections, an 11th intercostal incision, a dorsolumbar flap and rarely the combined thoracoabdominal incision.

The posterior approach has been advocated due to its minimal muscle tissue distruction, simultaneous operation of the other kidney without repositioning of the patient, ease route from the skin for entering renal structures without entering any body cavity,

has minimal postoperative discomfort and drainage from the area is dependent with the patient in supine position.

The choice of incision and approach to ureteral surgery is based on the location and shape of the stone[16]. A midline incision from the umblicus to symphisis pubis can be utilized for the removal of lower ureteral or intramural stone. The decision for intra or extravesical approach to the stone depends on its location. The other is Gibson incision where a patient is placed in modified flank position and an oblique incision from midpoint 2 to 3cm cephalad to the anterior iliac crest made whose extension depends on ureter exposure required (extraperitoneal). This incision has advantage of exposing both middle and upper ureter plus early recovery. For exposure of the upper ureter, midline approach (extra/intra-peritoneal) is an alternative, as contralateral access if required is an additional advantage. The posterior approach or even the lateral approach as for renal calculus offers good exposure of upper or proximal ureter.

At stone extraction longitudinal ureterostomies is preferred since longitudinal axis of the ureter is parallel to its vascular supply, thus there's minimal disruption of ureteral blood supply unlike transverse incisions[16]. Healing of the muscular middle layer if faster with longitudinal incisions. A point to

remember; stone can migrate even intraoperatively from preoperative position so minimal ureteral manipulation may prevent disloging the stone. After the stone is removed, the ureter is intubated proximally and distally with a rubber catheter and irrigated. This ensures patency of the lumen and hopefully identifies stone fragments. The use of stents has been reserved to extensive uretorostomies or in those associated with significant infection. Closure of ureter incision is with several interrupted suture of absorpoable material for instance 5-0 chromic catgut and not with non-absorpable suture material as it can form a nidus for another stone formation.

Among the complications to be anticipated are loss of stone intraoperatively, sepsis, ureteral necrosis due to inadvertent removal of periureteral tissue, ureterocutaneous fistula and lastly, the long term risk of formation of a stricture. In good hands and with proper surgical technique these complications are rare. However when arisen or encountered should be managed appropriately. In the present study, ureterolithotomy was done to three of the patients, while the remaining, pyelolithotomy and nephrolithotomy were performed respectively. The later is the patient in the "case presentation" with acute on chronic renal failure whose renal function improved to near

normal postoperatively.

NON OPERATIVE INTERVENTION

The recent introduction of endo urological techniques for stone manipulation has modernized the therapeutic capabilities[3]. These are superior to conventional open surgery for instance for renal stones in terms of morbidity, length of hospital stay, convalescence, and cost effectiveness[17].

Patients are first evaluated for an underlying primary cause as for preoperative management in operative treatment of the upper urinary tract calculi. Appropriate treatment is given in presence of infection.

Various techniques are now available in some centres for stone manipulation hence their removal. With the use of "Percutanous nephrolithotomy" Whitfied[17] had 87% success rate for complete stone clearance in 150 patients with renal stones. He commented that better instrumentation and selection of patients contributed to the success rate and that staghorn calculi, upper pole caliceal stones, high kidneys, duplex collecting systems and multiple stones all remain relative but not absolute contraindications to the procedure.

Bishop et al[18], reported good success rate in their series of 140 patients, with the use of "blind" basket extraction (use of Domia or Pfister-Schwartz type) and ureteroscopic extraction with the rigid ureterorenoscope. "Blind" basket extraction was used for small calculi (7mm in diameter) situated below the pelvic brim. These lead to considerable reduction in open ureterolithotomy. However despite of the good results, perforation (in 14% of the cases) was the commonest complication of ureteroscopic stone surgery.

Royce et al[19], recommended "extra - corporeal shockwave lithotripsy" (ESWL) and urinary alkalinization as a complementary, non invasive method for treating upper urinary uric acid calculi. Oral urinary alkalinization with sodium potassium citrate was started immediately after ESWL to maintain urinary pH of 6.5 to 7.0. The success rate was 76% at three months and 90% at five months i.e stone free.

Payne et al[3], with a wide experience with over 500 percutenous nephrolithotomies, 100 transurethral ureteroscopies and 300 ESWL, have developed a strategy for management of upper tract calculi in their centre. They concluded that, a combination of these endoscopic procedures enables upper urinary tract calculi to be

treated with minimal morbidity and tremendous cost effectiveness. Also, they should be used when there's an indication, to avoid or minimize complications. By combining these skills, open operative intervention has been limited to lithotomy associated with non-functioning kidneys, structural drainage abnormalities and staghorn calculi with most of their bulk in the periphery of the kidney.

CONCLUSION

(1) Non operative intervention to upper urinary calculi when indicated is more appropriate over operative method in terms of morbidity, hospital stay, early recovery and cost effectiveness If our purchasing power increases in future, priority should be given in obtaining the tools for the non operative technique for removal of upper urinary calculi.

(2) The study also calls for extensive community based survey to determine the prevalence and possible causes of urinary stone disease. The study will help in determining the appropriate preventive measures.

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TORSION OF THE TESTIS

SUMMARY

Torsion of the testis seem to be rare at Muhimbili Medical Centre. In a one year period (1989), the author encountered two cases. The first, had an unilateral testicular torsion. A successful emergency surgical detorsion was done. The other presented with an acute unilateral testicular pain, initially thought to as acute epididymorchitis. Exploration confirmed testicular torsion but the involved testis was already gangrenous. Orchidectomy and prophylactic fixation of the other testis to the scrotum was done. It has been recommended that children and prepubertal patients presenting with sudden testicular pain, with no fever or signs of infection should have testicular exploration to avoid testicular infarction.

INTRODUCTION

In the past, testicular torsion was reported uncommon. However many hospital data in developed countries nowadays show an increasing annual incidence.(1) The magnitude of the condition in our society is still undetermined, but it has been an uncommon condition in this Medical Centre. May be, we are misdiagnosing the condition or it has a lower incidence. As reported by Williamson(2)

"in warmer climes, such as Australia, Trinidad and India, the incidence appears to be substantially low". Possibly we dont differ as our climate is almost similar.

The difficulty in the diagnosis of testicular torsion and its management as a surgical emergency in young males still persists in our society. The present study has pointed some of these difficulties and possible ways of managing this condition. Two cases have been presented fully, and a discussion focussing on precipitating factors, incidence, management and the outcome of testis after torsion is made.

CASE PRESENTATION

CASE I:

L. J. a 14 year old patient was admitted at Muhimbili Surgical ward due to a right scrotal pain of two hours duration.

The onset had been sudden. The pain was sharp and continuous, radiating to the medial aspect of his thigh and the right inguinal region. There were no relieving factors. As pain persisted, he noticed a gradual swelling of his right testis. He denied history of trauma to his genitalia, dysuria, haematuria, urethral pus discharge or increased frequency of micturation. No history of similar attack before.

While he was being attended he had a non projectile vomiting once. The vomitus were scanty and mostly contained the breakfast he had taken half an hour before comming to the hospital. He had normal bowel habit and he denied history of fever or abdominal distension. He had no history of chronic productive cough or of being attended for other illnesses. He was a standard six primary school pupil, fifth in the family. No other member of his family had had similar condition.

Clinically he was in pain, anxious, afebrile not dehydrated or pale. He had normal vital signs. His abdomen was not distended and moved well with respiration. There was no organomegally. He had no hernia per hernial crifices. Rovsings sign and Psoas test were all negative. His right testis was swollen, tender but not warm. There was no urethral discharge. Skin overlying it appeared normal. Prehn's test was negative. The prostate was not enlarged or tender on per rectal digital examination.

Initial impression of acute right testicular torsion was made. He was then prepared for emergency testicular exploration. Intravenous fluids, sedation and monitoring of vital signs were started. A signed consent from his father was obtained.

In major theatre, the patient was given general anaesthesia, and bilateral testicular exploration was performed through scrotal approach. The affected right side was explored first. A small secondary hydrocele had formed already. The tunica vaginalis was opened and serosanguinous fluid was drained. A torsion of the testis round the mesorchium one and half turns and a swollen testis were identified. The proximal epididymis was oedematous. After detorsion the testis was declared viable. Eversion of tunica vaginalis was done through Jaboulay technique. The lower pole of the testis was prophylactically fixed to the inside of the scrotal cavity by silk no.2/0.

The left testis and epididymis were found normal. There was a long mesorchium as well. The testis was prophylactically fixed to the scrotum similarly. The scrotal incision was closed in layers.

Postoperative period was uneventiful. He was discharged home on the fifth day in good condition.

CASE 2:

M. M. a 22 year old male patient was referred for surgical attention from a peripheral hospital with a diagnosis of acute appendicitis.

He presented with history of sudden onset of pain of two hours duration in his right groin. The pain was sharp, continuous and radiated to the medial aspect of his right thigh and right inguinal region. He denied history of increased frequency of micturation, dysuria, haematuria, or trauma to the groin. Two hours later, he developed painful swelling of the right testis. On his way to the hospital he vomited three times (non-projectile), and had no history of abdominal distention or constipation.

He works as a driver and has not been admitted in hospital before.

Clinically he appeared ill-looking, afebrile, not dehydrated or pale. His vital signs were normal. The abdomen was not distended and moved well with respiration. No abdominal tenderness was elicited and Rovsings sign was negative. Psoas test and obturator tests were negative. His right testis was slightly swollen, tender and not warm. There was no urethral discharge. The prostate was not enlarged or tender on per rectal digital examination. No mass or tenderness was vident at the right iliac fossa. Similarly, the urethra was non tender with no indurations. Patient felt less pain when the right testis was elevated.

Initial impression of epididymorchitis was made Parenteral antibiotics were started. After 12 hours of observation in the ward, the right testicular pain persisted. Patient was re-evaluated and right testicular torsion was suspected. He was then prepared for testicular exploration.

Under general anaesthesia, bilateral testicular exploration was performed through scrotal approach. The main findings were a gangrenous right testis together with its appendix, secondary hydrocele on the same side and a normal left testis. Both testes had very long mesorchium. Orchidectomy was performed to the right gangrenous testis, then the left testis was prophylactically fixed with silk no 2/0 to the scrotum.

The postoperative period was uneventiful. He was discharged home on the sixth day in good condition.

DISCUSSION

1. PRECIPITATING FACTORS:

Anderson et al[1] reported the following anatomical abnormalities of testicular fixation; high investment of turnica vaginalis, "bell-clapper" deformity, and a long mesorchium between the epididymis and testis. Scudder et al[3] reported the same. Many authors are suprised of the fact that though these anormalies occur on both sides, bilateral

torsion is not a common event. Again, the actual force initiating torsion in susceptible testis is poorly understood.(3)

Injury plays a very minor role as an aetiological factor. Williamson(3) commented that neither trauma nor a history of recent exercise prevailed in his series and occasionally the onset of symptoms occurred during sleep. In a large series of 670 cases only 30 had a clear history of injury prior to the onset of the torsion. History of recent exercise, bicycle riding and coitus prior to torsion were evident in less than 10% of cases in the same series.

Ambient temperature also plays a role in incidence and aetiology of testicular torsion. In temperate climates, the condition has been found to occur more during cold season.(1) This explains the seasonal variation in incidence within the British Isles and geographical variations within the Indian subcontinent(2) Dartos muscle overactivity has been implicated to precipitate testicular torsion during cold weather.(2,4)

Torsion of the testicles in siblings has rarely been reported.(5) Only in few patients familial history is evident.(1.5) In the present study, apart from having a long mesorchium between the testis and epididymis, no obvious precipitating factor was identified.

2. INCIDENCE

By 1901 Scudder reported 32 cases from the world literature. For many years thereafter, surgeons continued to consider testicular torsion as a rarity.[3] During recent years the disease has been widely recognised with several cases yearly[3]. In Bristol, the annual incidence for the past few years had been 1 case per 4,000 males at risk[1, 2].

Torsion of the testis can occur in utero and up to the age of 68. However, it is commonest around puberty with a second but much smaller peak in the first year of life.[2, 3] Lawrence[6] reported the condition to be more in the first two decades of life and uncommon beyond 25 years of age. In the present study both were around their second decade of life.

In the past, torsion was thought to occur more on the right side in connection to increased incidence of maldescent on the right side[3]. However recent studies have shown a slight left sided shift which is explained by greater length of the left spermatic cord.[1,2,3] In the present study, the torsion involved the right testis in both the patients.

3. CLINICAL FEATURES

Scrotal pain, is a common symptom. In Anderson series[1], 89% complained of scrotal pain which in the majority was localized. In a few cases it radiated to the groin, abdomen or to the thigh. The pain of acute testicular torsion is typically of sudden onset, but it may occationally build up slowly[3]. Pain may be absent in neonatal torsion and occasionally in older children.

Vomiting is another highly suggestive feature. In a number of series, it occurred in 35 - 50% of cases.[2,3] Least common is urinary symptoms, like slight frequency and dysuria which are mostly confined to the younger age group.[1,3]

Some may present with past history of similar attacks of unilateral or bilateral testicular pain and swelling. This occurred to 37-47% of cases in several series.[1,2,3]

The affected testis is swollen, and tender. In one third of patients, the testis was reported to be in an abnormal lie during preoperative examination.[3] The typical horizontal lie of twisted testis is sometimes difficult to appreciate due to oedema formation and the severe testicular tenderness.

The cord above the testis may be thickened with a definite knot which is sometimes palpable.(6) Erythema and oedema of the overlying skin and low grade pyrexia were all associated with a longer duration of torsion.(1) These signs indicate the late presentation. Secondary hydrocele may be found pre-operatively or at operation.

4. DIFFERENTIAL DIAGNOSIS

Important differential diagnoses before puberty are torsion of testicular appendage, strangulated inguinal hernia (especially with undescended testis), acute hydrocele and idiopathic scrotal oedema, and after puberty acute epididymitis, haematocele, tumor and viral orchitis.(2)

Torsion of the testis has most frequently been mistaken for acute epididymorchitis, an error which automatically dooms the organ to necrosis.(3) Most patients are commenced on antibiotics and later admitted to hospital due to failure of medical treatment. In most instances by this time the testis is already infarcted. Epididymorchitis is very uncommon in aldolescent males in absence of underlying urinary tract disease.(2)

The second patient in the present study had all features of acute testicular torsion, yet he was mistaken for epididymorchitis.

It has been observed that, the later condition is common in the same younger age group in this Medical Centre. The sudden onset of the condition, lack of urinary tract disease or fever and testicular swelling would have alerted the attending doctor that it wasn't a case of epididymorchitis. Key et al[7] reported that some of these features may be unreliable as only 46% of patients in his series with epididymorchitis presented with pyuria, and 60% of patients with torsion had normal urinalyses. However the presence or absence of prostatic tenderness may be a valuable pointer.[3] Although the patient experienced less pain by elevation of the testis suggestive of orchitis, most authors have found this prehns' test very unreliable.[3]

Quite often, testicular torsion has been mistaken for acute appendicitis when a young patient presents with abdominal pain, vomiting and testicular pain. This occurred to three boys in Williamson[3] series. One had appendicectomy done on the day of admission and right orchidectomy on the following day. Same could have happened to the second case in the present study.

5. INVESTIGATIONS

i) Testicular scaning with 99m technetium pertechnetate for rapid assessment of the patient with scrotal pain has been very useful[7] in differentiating testicular

torsion from other entities.[7]

The technique doesn't cause delay for definitive treatment, moreover it provides reassurance when clinical features are unimpressive.[8] However it should be interpreted in the light of clinical findings.[7] Unfortunately the test is not available in this Centre. Testicular scanning is superior to doppler ultrasound[9] which has high incidence of false negatives and rather insensitive in acute torsion.[2] None of them is available in our Centre.

ii) Tests aimed at differentiating testicular torsion from the above mentioned differentials include urine tests for epididymorchitis, and abdominal radiographs to exclude gut obstruction. However these tests should never lead to operative delay if torsion seems most likely.

6. TREATMENT

Manipulative reduction was first reported by Nash in 1893 though the testis subsequently underwent partial atrophy.[3] Although this technique is done as a first aid measure[3] explorative surgery should always follow. If the testis is viable then orchidopexy is done bilaterally to avoid recurrent torsion.

Torsion of the testis is a real surgical emergency.[3] Under general anaesthesia the testicle is explored through scrotal approach, then delivered.[10] The parietal tunica vaginalis is opened, hydrocele fluid removed which is often serosanguinous. The epididymis will be found grossly enlarged, congested and mesorchium twisted more than one complete turn. It is then untwisted[10]. Return to normal colour and bleeding after operative detorsion suggests viable testis.[2] Eversion of the tunica vaginalis by Jaboulay technique provides sufficient adhesions to prevent any possible future torsions.[3] Non viable testis is removed to prevent subsequent extrusion through the wound[2]. Same was done to the patient in the present study after finding him with a non viable testis. Prophylactic fixation of the contralateral side was done as discussed earlier.[3,11]

7. TESTICULAR VIABILITY

Williamson[3] reported that testicular viability, depends upon the following four factors.

i) Spontaneous reduction. When this occurs it is advisable to plan for prophylactic surgical fixation to prevent recurrent torsion before the patient leaves the hospital.[11]

ii) The delay between onset of symptoms and time of operative (or manipulative) reduction. Immediate exploration may salvage up to 90% of twisted testes. Obvious infarction or damage sufficient to cause subsequent atrophy can ocur within 4 and almost enevitable after 8–10 hours[8]. However, in a single twist of the cord which is not very tight the testis can survive longer.[3]

iii) The degree of torsion of the cord. Thomas[8] commented that even the site matters as well because 80% of undescended testes in his series that underwent torsion failed to survive.

iv) Adequate follow up for assessment of testes replaced in the scrotun. Thomas[8] reported that up to two thirds of those testes replaced at operation in his series later underwent some degree of atrophy.

It has been observed and reported that the fertility of men who have had previously unilateral testicular torsion followed by preservation of "viable" testis is reduced.[8,11] As judged by seminal analysis they have low sperm count and it has been suggested that an ischaemic testis may cause pathological changes on the opposite

side by immunological mechanism[8,2]. This mechanism causes destruction of surviving spermatogonia in a similar manner to sympathetic opthalmia[2,8]. However, the data to confirm autoimmunization is still conflicting. If confirmed, surgeons will have to adopt radical measures, rather than conservative policy to prevent sympathetic orchidopathia[2,8,11,12]. For instance, the duration from onset of symptom to presentation should be specified, so that beyond it testicular exploration followed by orchidectomy has to be performed whether necrotic or not. Likewise if undescended testis undergoes torsion, it has to be removed because of its increased failure to survive. The aim is to salvage the other testis from possible pathological changes by immunological mechanism with the resulting testicular atrophy in future and hence, secondary infertility.

RECOMMENDATION

From this study the author recommends that children, prepubertal patients and adolescents presenting with sudden testicular pain with no fever or signs of infection should have an emergency testicular exploration to avoid gangrene of the testis and testicular infarction. There after, they can be followed up closely for long duration with respect to their fertility.

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