RUPTURED UTERUS: FIVE YEARS RETROSPECTIVE ANALYSIS OF THE CAUSES, COMPLICATIONS AND FETAL/MATERNAL OUTCOMES AT MUHIMBILI NATIONAL HOSPITAL IN DAR-ES-SALAAM, TANZANIA

By

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A dissertation submitted in partial fulfillment of the requirement for the degree of Master of Medicine in Obstetric and Gynecology of the Muhimbili university of Heath and allied sciences

Muhimbili University of Health and Allied Sciences
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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled: **Ruptured uterus: Five years retrospective analysis of the causes, complications and fetal/maternal outcomes at Muhimbili National Hospital** in partial fulfillment of the requirements for the degree of Master of Medicine in Obstetrics and Gynecology of the Muhimbili University of Health and Allied sciences.

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for Dr Kidanto, HL

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1/12/2009

Date

DECLARATION AND COPYRIGHT

I, Dr Ipyana Hudson Mwampagatwa, declare that this dissertation is my own original work, and that it has not been presented and will not be presented to any other University for a similar or any other degree award

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Abstract

Background: Rupture of a gravid uterus is a serious complication that is associated with a high maternal and perinatal morbidity and mortality. At Muhimbili National hospital, there is a high incidence of ruptured uterus as well as the associated maternal and perinatal mortality. Reduction of the frequency of this obstetric emergency and its associated complications requires a collaborative effort between Muhimbili National Hospital and referring hospitals as well as availability of medical supplies and skilled personnel of all cadres.

Objectives: To determine the incidence, causes, complications and fetal/maternal outcome among women with the diagnosis of ruptured uterus at Muhimbili National Hospital in Dar es salaam, Tanzania

Method: This was a retrospective study. Case notes (from 2003 to 2007) of patients with the diagnosis of ruptured uterus were retrieved and a structured checklist was used to collect patients' information. This was supplemented by information from midwifery books and operation/theatre records.

Results: There were 55152 deliveries between 2003 and 2007 of which about 30% were delivered by caesarean section. A total of 162 cases of ruptured uterus were recorded in five years studied. However, only 123 (76%) case notes were available for analysis. Most of the uterine ruptures occurred due to neglected obstructed labor (37.8%) and previous caesarean section scar 33.6%. Other causes were: use of misoprostol alone 8.9%, use of oxytocin 7.3%, a combination of misoprostol and oxytocin 11.4%, previous repair of

uterine rupture 2.8% and previous myomectomy 2.1%. Majority of uterine ruptures occurred in women in their second to fourth parity (80%) and ruptures were complete in 78%. Associated complications of ruptured uterus or surgery were vesicle vaginal fistula, ureter injuries, rectovaginal fistula and urinary bladder injury and sepsis was found to be the commonest complication occurring in 14.8%. Subtotal abdominal hysterectomy was the most common surgical intervention (82%).Rent repair and sterilization (Bilateral tubal ligation) was done in 19.5% of cases, and repair only in 11.4%.Total abdominal hysterectomy was the least commonly done operation, (2.4%). Maternal case fatality rate was 12.2% and fetal case fatality rate was 97.6%. Ruptured uterus contributed to 9.2% of all causes of maternal deaths at Muhimbili national Hospital between 2003 and 2007. Majority (82.1%) of patients in this study were referred from other health facilities and 15% of all cases of ruptured uterus the diagnosis was made in the referring facilities.

Conclusion: The incidence of ruptured uterus at Muhimbili National Hospital is high and contributes significantly to both maternal and fetal morbidities and mortalities. The leading causes being obstructed labor, previous caesarean sections sacra and use of uterotonic drugs for induction and/or augmentation of labor. Others were previously ruptured uterus and myomectomy scars. Most of these patients were referred from municipal hospitals in dare s salaam and coastal regions. Proper monitoring of labor both in these referring facilities and at MNH will contribute to the reduction of these morbidities and mortalities.

CONTENTS **Page**

CERTIFICATION---------- i

DECLARATION AND COPYRIGHT---------- ii

ACKNOWLEDGEMENT---------- iii

ABSTRACT---------- iv

CONTENTS---------- iv

LIST OF TABLES---------- viii

ABBREVIATIONS---------- ix

1.0 INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction---------- 1

1.2 Literature review---------- 5

2.0 STATEMENT OF THE PROBLEM---------- 12

3.0 RATIONALE OF THE STUDY---------- 12

4.0 OBJECTIVES

4.1 Broad objective---------- 14

4.2 Specific objectives ---------- 14

5.0 METHODOLOGY

5.1 Study design---------- 15

5.2 study duration..... 15

5.3 Study setting---------- 15

5.4 Study population---------- 15

5.5 study sample..... 15

5.6 Inclusion criteria---------- 16

5.7 Exclusion criteria---------- 16

5.8 Data collection---------- 16

6.0 Ethical issues---------- 16

6.1 Data analysis---------- 17

6.2 study limitations..... 17

7.0 RESULTS---------- 18

8.0 DISCUSSION---------- 25

9.0 CONCLUSION---------- 33

10.0 RECOMMENDATIONS---------- 34

12.0 REFERENCES---------- 35

13.0 APPENDICES

14.0 Questionnaires---------- 41

LIST OF TABLES **Page**

Table 1: Characteristics of study population---------- 18

Table 2: incidence and case fatality rate of ruptured uterus at MNH. - - 20

Table 3: Causes of ruptured uterus at MNH ---------- 21

Table 4: Fetal/maternal outcomes---------- 22

Table 5: surgical findings---------- 23

LIST OF ABBREVIATIONS

MNH	-	Muhimbili National Hospital
MUHAS	-	Muhimbili University of Health and Allied Sciences
PROM	-	Premature Rupture of Membranes
LSCS	-	Lower segment cesarean section
STAH	-	Subtotal abdominal hysterectomy
TAH	-	Total abdominal hysterectomy
ANC	-	Antenatal clinic
TOL	-	Trial of labor
TOS	-	Trial of scar
VBAC	-	Vaginal birth after cesarean section
PGE	-	Prostaglandin E
PGF	-	Prostaglandin F
CPD	-	Cephalopelvic disproportion
BTL	-	Bilateral tubal ligation.
RU	-	Ruptured uterus.
VVF	-	vesico-vagina fistula

INTRODUCTION

Rupture of a pregnant uterus is a serious obstetric emergency and a common cause of maternal death. The incidence of uterine rupture varies appreciably among countries. While literature reports that in the developed world the frequency of ruptured uterus has dropped significantly[9], it is still a major public health problem in developing countries accounting for 5-18% of all maternal deaths and a corresponding perinatal mortality rate of 30-95% in different countries [1,8,9].

In Yemen ruptured uterus accounts for 14.9% of all maternal deaths[2] while in Ethiopia it accounts for 24% of all maternal deaths[3].At Muhimbili National Hospital in the year 2007, ruptured uterus contributed 11.1% of all maternal deaths . This has been the highest recorded for the five years of this study[4].

In high-income countries ruptured uterus occurs as an occasional obstetric mishap frequently following complications of oxytocin induction/augmentation, trial of prior uterine scar or abdominal trauma such as car accident. In developing countries several underlying factors like poverty, traditional practices, high parity, lack of antenatal care, unsupervised deliveries ,poor supply of medical equipments and consumables, and dwindling health care funding have to be taken care of [5,6,7]

Rupture of the uterus may be complete or incomplete depending on whether it opens into the peritoneal cavity or not. It is complete if it communicates with the peritoneal cavity directly and incomplete if it is separated from the peritoneal cavity by the visceral peritoneum and therefore the fetus is not extruded into the abdominal cavity [10,11].

Maternal consequences are related to whether there is rupture of an intact uterus or a prior uterine scar. Scar separation following a trial of scar is associated with a lower risk of maternal death compared to spontaneous rupture of an unscarred uterus[12,31].Spontaneous rupture of unscarred uterus is associated with higher maternal case fatality rate compared to rupture of a previously scared uterus and it can be as high as 40 to 50 %[13,14].

The risk of maternal death due to uterine rupture is 0-1% in high income countries, but in low income countries it ranges between 5-10%[15,16] . The availability of modern medical facilities in developed nations is likely to account for this difference in maternal outcomes.

Fetal morbidity invariably occurs because of catastrophic hemorrhage leading to fetal anoxia .With rupture and expulsion of the fetus into the peritoneal cavity the chances of fetal survival are minimal. If the fetus is alive at the time of rupture, the only chance of continued survival is afforded by immediate diagnosis and delivery by laparatomy. Case fatality rate in rupture uterus may be reduced by early diagnosis, urgent resuscitation and laparatomy. Any form of delay increases the chances of dying from severe hemorrhage[17].

Uterine rupture usually occur during the course of labor but in some cases uterine rupture can occur during pregnancy without labor, typically this occurs in cases of a uterine scar from classical cesarean section, placenta percreta, invasive mole, choriocarcinoma and cornual pregnancy. Rupture that occurs during labor is much more dangerous than that occurring remote from term/labor because infection is almost inevitable and shock is usually greater[9,19,42].

The time available for successful intervention after frank uterine rupture and before the onset of major fetal morbidity is very short. Therefore, once the diagnosis of uterine rupture is considered, all available resources must be quickly and effectively mobilized to successfully institute timely surgical treatment that results in favorable outcomes for both the newborn and mother[21].

The most critical aspects of treatment in the case of uterine rupture are establishing a timely diagnosis and minimizing the time from the onset of signs and symptoms until the start of definitive surgical therapy. Once a diagnosis of uterine rupture is established, immediate stabilization of the mother and the delivery of the fetus are imperative. After the fetus is delivered, the type of surgical treatment for the mother will depend on the type of uterine rupture, extent of uterine rupture, degree of hemorrhage, general condition of the mother and mother's desire for future childbearing[22,23].

Other factors that may determine the type of surgical intervention includes urgency, patient's general condition as well as surgeons experience. Conservative surgical management involving uterine repair should be reserved for women who have low

transverse uterine rupture, no extension of the tear to the broad ligament, cervix, or paracolpos ,easily controllable uterine hemorrhage, good general condition, desire for future childbearing and no clinical or laboratory evidence of an evolving coagulopathy[17].

Hysterectomy should be considered the treatment of choice when intractable uterine bleeding occurs or when the uterine rupture sites are multiple, longitudinal, or low lying, bruised and contaminated[24,25].

Ruptured uterus is in most cases a result of neglected obstructed labor and it is associated with a number of long term maternal complications which in some way affect the quality of life of the affected women if at all she will survive the acute phase of the condition. These include vesicovaginal fistula, rectovaginal fistula, bladder rupture, foot drop, and psychological trauma[2].

As in many other obstetric emergencies, maternal deaths occurring due to ruptured uterus are largely due to delays in receiving the definitive treatment (laparatomy in this case). Level I is where the patients delays at seeking care at the health facility due to different reasons (delayed decision making). Level II is when the patient delays to arrive at the facility and level III is when the patient delays to receive service while already at the facility . This can occur because of shortage/lack of qualified staff to perform the operation, lack of supplies, negligence, low motivation as well as poorly supervised staff by management at the level of the department or the hospital. In practice it is crucial to address the third delay (level III delay) first, for it would be useless to facilitate access to a health facility which is not well staffed, well equipped and providing good quality care.

LITERATURE REVIEW

The occurrence and etiology of rupture of the uterus vary in different parts of the world. In a study done at Adigrat Hospital in Ethiopia, it was found that most of the cases were due to cephalopelvic disproportional (53.7%). Others were use of oxytocin 3.7%, prior uterine scar 11.2%, malpresentation and malposition 25.9%placenta percreta and instrumental delivery 1.5 and 3.7% respectively[2].

At LTMG Hospital, Sion, Bombay researchers studied the changing trends of etiology and management, and it was found that there were 64 cases of uterine rupture between 1980 and 1989 where rupture of unscarred uterus accounted for 70.3% due to either use of uterotonics or obstructed labor. Rupture of scared uterus contributed 23% whereas traumatic rupture contributed 7.8%[26].

In a study done at Ayub teaching Hospital in Pakistan on the frequency, clinical presentation and maternal/fetal outcomes of ruptured uterus results showed that majority of uterine ruptures were associated with unscarred uterus (85.3%). Of these, 32% were due to inappropriate use of oxytocin, 20.5% due to obstructed labor[27].

At Obbafemi Teaching Hospital in Nigeria between 1991 and 2000, the incidence of uterine rupture was found to be 1 in 273 deliveries. In this study the predisposing or etiological factors were prolonged labor, grand multiparty, injudicious use of oxytocin, uterine scar, obstetric manipulations and abnormal lie. The case fatality rate was found to be 21.3%.Most of these ruptures were attributed to failed recognition of abnormalities in

the antepartum and/or intrapartum periods, delayed referrals and injudicious use of oxytocin[7].

At Kathmandu Medical Hospital in Nepal a study was done to associate the incidence of ruptured uterus with distance from where the patients came from, parity, age and fetal/maternal outcomes. In this study it was found that the incidence of rupture was 1 in 1100 deliveries (0.09%) with a case fatality rate of 7.9%.There were 60% spontaneous rupture,29% scar rupture and 11% traumatic rupture. Most of the cases were between ages 25-29, third to fourth gravida, and without antanatal attendance.70% had complete rupture.About 60% of the patients were managed by repair of uterus with bilateral tubal ligation (BTL), 24% repair only 15% had hysterectomy done[11].

Parity is an independent risk factor for uterine rupture. In parous women the myometrium becomes tolerant to the effect of acidification during prolonged obstructed labor by unknown mechanism and does not stop contracting as it occurs in primipara women. Continued contraction in the presence of energy depletion and hypoxia lead to myometrial oedema and necrosis contributing to uterine rupture[45] .Many studies report data which show that parity predisposes to rupture of a gravid uterus [15,21,23,28].

Use of uterotonic drugs is reported to increase the risk of uterine rupture. One multicenter study compared the risk among those in whom oxytocin was used in patients with previous low transverse cesarean section scar and those in whom it was not used. Results showed that there was no significant difference among the two groups in terms of patient's incidence of uterine rupture, maternal morbidity, fetal morbidity, or fetal mortality. From here they conclude that the judicious use of oxytocin is safe in the patient

with a previous low transverse cesarean section in carefully selected cases[31].This differs from another study done at Massachusetts General Hospital, *where induction* of labor with oxytocin was found to be associated with an increased rate of uterine rupture in gravid women with prior uterine scar in comparison with the rate in spontaneously laboring women[32].

Adenomyomectomy may be a possible risk factor for uterine rupture in subsequent pregnancy, but few reports have described it. In a study done at Jichi medical university, researchers reported two cases of uterine rupture in a primegravida following the procedure were reported. The uterus ruptured at the site of previous surgery of the uterine body, which was reconstructed[33].

The effect of previous cesarean delivery on the risk of uterine rupture has been studied extensively. In two different meta-analysis, pooled data from different studies showed that the uterine rupture rate for women undergoing a trial of labor (TOL) after previous cesarean delivery was higher compared with patients undergoing elective repeat cesarean delivery. But again the risk of rupture depends upon the type of section done[40,44].

Some rare complications are associated with an increased risk of rupture of the uterus. Studies have reported mullerian anormalies as well as pregnancies implanted in the rudimentary horn of the uterus to be associated with rupture of the uterus[33,38,39].

Interval between pregnancies after cesarean section is a known risk factor for rupture of the uterus. In one study interpregnancy interval between cesarean delivery and a

subsequent pregnancy of less than 6 months was nearly 4 times as common among patients who had uterine rupture than in control subjects (17.4 compared to 4.7%). Among 23 patients who had uterine rupture after a previous cesarean delivery, the mean interpregnancy interval was 20.4 months compared with 36.5 months for control subjects[41].

Uterine rupture usually occurs in advanced induced pregnancies, but some cases have been reported where uterine rupture occurred during induced abortions. One study described the history of 2 patients who experienced rupture of the uterus during prostaglandin-induced abortion. Both patients, aged 29 years (15 weeks gestational length, parity 2) and the other, 35 years old (24 weeks gestation, parity 6) presented with fetal death in utero. Both patients were managed with high doses of oxytocin as well as intravenous infusion of prostaglandins (PG) E2. From these results researchers commented that it is possible that rupture of the uterus to occur during induction of abortion[34].

At a general Hospital in Jerusalem, Israel a study was done aiming to compare risk factors, site of rupture, and outcome of uterine rupture among patients with a scarred versus an unscarred uterus was done during the study period. No significant differences were noted between the scarred and unscarred groups while comparing risk factors such as birth order, birth weight, hydramnios, oxytocin induction, diabetes, and malpresentation. The main site of involvement in both groups was the lower uterine segment representing 92.6% of the ruptures in the unscarred group and 92.3% of the ruptures in the scarred uterus group. Cervical involvement was significantly more

common among patients without a previous uterine scar (33.3% vs 7.7%. Conversely, uterus corpus involvement did not differ between the groups. Perinatal mortality did not differ between the groups. In addition, no significant differences were noted regarding maternal morbidity such as the need for hysterectomy, blood transfusion, or length of hospitalization[36].

In a study done in one Canadian province to review the incidence, associated factors, methods of diagnosis, and maternal and perinatal morbidity and mortality associated with uterine rupture, 92% of cases of uterine rupture were associated with previous cesarean delivery. Uterine dehiscence was associated with minimal maternal and perinatal morbidity. In contrast, complete uterine rupture was associated with significantly more maternal blood transfusion and neonatal asphyxia[30].

Ruptured uterus is associated with high maternal mortality, maternal morbidity and perinatal mortality. In a study done in Ethiopia, the frequency of ruptured uterus was 1:110 deliveries, maternal case fatality rate was found to be 11.1% and fetal fatality rate was 98.1%. And the overall contribution of ruptured uterus to maternal deaths was 24% which is a significant contribution [2].Similar findings are reported by other scientists in different parts of the world [35].

In a study done at Mansa general Hospital in Zambia for one year, 32 cases of uterine rupture were recorded. Most of the ruptures occurred during labour in 30 cases (94%). Rupture was associated with cephalopelvic disproportion in 24 cases (75%). Three women had previous caesarean section (9.4%). Two ruptures occurring in hospital were due to oxytocic stimulation and assisted breech delivery with undiagnosed mild

hydrocephalus (6.3%). After laparotomy it was found that most of the ruptures were complete ruptures (70%), located in the lower uterine segment half of the cases, and bladder injury occurred in seven (23%). Subtotal hysterectomy was performed in 14 cases (47%); caesarean section with uterine repair in eight (27%); uterine repair only in eight. In this study the maternal case fatality rate was found to be 44%.Further more primigravida teenagers living far from hospital and relying on a traditional birth attendant were mostly affected[14].

Researchers in Doha did a review on the incidence of ruptured uterus at Women's Hospital, Hamad Medical Corporation (HMC) , highlighting the management approach of suture repair in relation to maintaining the patient's future fertility, and study subsequent pregnancy outcome and the risk of recurrent uterine rupture. The study was done for a period of 15 years, from 1 January 1983 to 31 December 1997. There were 17 cases of ruptured uterus. The incidence of ruptured uterus was calculated to be 0.012%; eight (47%) of these occurred in patients with previous cesarean scars, while nine cases (52.9%) were grand multiparas (5 or more). In nine cases (52.9%), uterine rupture was associated with oxytocin use, and four patients (23.5%) were associated with prostaglandin E2 (PGE2) use. Abdominal hysterectomy was performed in eight cases (47%). The remaining nine patients had suture repair, two with sterilization, and the other seven without sterilization. The Researchers commented that suture repair should be considered whenever possible to maintain the patient's future fertility[37]

Maternal death as a consequence of uterine rupture occurs at a rate of 0-1% in high income countries, but in low income countries it ranges between 5-10%. The availability

of modern medical facilities in developed nations is likely to account for this difference in maternal outcomes[15,16] .The maternal deaths are mainly due to severe hemorrhage and delay in patient management as well as the lack of well trained personnel and equipments/supplies.

PROBLEM STATEMENT

Maternal and fetal morbidity and mortality are high in Tanzania. Ruptured uteri contribute significantly to maternal mortality. At Muhimbili National Hospital it contributes about 11% of all maternal deaths

No current data on the incidence, etiology, fatality rates and management outcome at Muhimbili National hospital.

This study aims at shedding light on the causes, trend and management outcome of patients with ruptured uterus. Findings from this study will indicate areas which need measurable improvement in order to prevent this catastrophic obstetric emergency.

RATIONALE OF THE STUDY

Ruptured uterus is one of the major causes of maternal mortality in developing countries accounting for about 5-18% of all maternal deaths and a corresponding perinatal mortality rate of 30-95% in different countries[1,8]. Many countries have experienced a change in etiology and outcomes which could probably due to increasing practice of use of new medications like misoprostol for induction of labor as well as improvement in management of ruptured uterus respectively. This study will shed light on the main causes, complications and management outcomes of women with ruptured uterus as managed at MNH for the past five years.

RESEARCH QUESTION

What is the incidence, etiology, complications and fetal/maternal outcome among women with ruptured uterus at MNH?

BROAD OBJECTIVE

To determine the causes, complications and maternal/fetal outcomes of uterine rupture at MNH from 2003 to 2007.

SPECIFIC OBJECTIVES

- To determine the incidence of uterine rupture for the period of five years at MNH between 2003-2007
- To determine the etiology of ruptured uterus at MNH.
- To assess the complications of ruptured uterus among patient with ruptured uterus at MNH.
- To determine the type of surgical options taken to patients with uterine rupture as managed at MNH from the year 2003 to 2007.

METHODOLOGY

Study design

This was a retrospective hospital based study.

Study duration

Five years (from 2003 to 2007.

Study setting

The study was conducted at the Muhimbili National Hospital during a specified period mentioned above. MNH is the larges referral, consultant and university teaching hospital in Tanzania. The labor ward here conducts deliveries of referred cases from district hospitals in Dar es Salaam and coastal region as well as self-referred pregnant women. Most of normal deliveries are self referral from home while most of complicated cases are referred from other facilities. On average, the labor ward conducts up to 30 deliveries per day whereas the caesarean section rate is about 33% of all deliveries.

Study population

The study included all pregnant women who delivered at MNH from January 1st 2003 to December 31st 2007.

Study sample

All women with the diagnosis of uterine rupture from January 1st 2003 to December 31st 2007 as seen at Muhimbili National hospital.

Inclusion criteria

- All women with the diagnosis of ruptured uterus that were managed at MNH from 2003 through 2007 were included in the study.

Exclusion criteria;

- Those who had ruptured uterus and managed at the peripheral hospitals and admitted to Muhimbili National Hospital here for management of the complications.

Data collection

Data was collected through a pretested Checklist and information was obtained from patient's files. All available files of women who had ruptured uterus between 2003 and 2007 were retrieved and case notes reviewed.

The check list contained the following categories of variables: Sociodemography, physical findings on examination during admission, causes of rupture, intraoperative findings, type of surgical intervention and both maternal and fetal outcomes.

Ethical issues

This is a retrospective study so patients were not directly involved but their clinical details were retrieved from their files. Confidentiality was maintained when handling the files such that case notes are not exposed to the people not concerned with this study.

Permission to use the files was sought from the Executive Director of the Muhimbili national Hospital.

The study was conducted after having an ethical clearance from the ethics committee of the Muhimbili University of Health and Allied sciences.

Data analysis.

Data was entered, cleaned and analyzed using EpiInfo 6 statistical package

STUDY LIMITATION

Being a retrospective study some patient's files and details were missing; this may have affected the results of the study.

RESULTS

During the five years of study, there were 162 cases of ruptured uterus at Muhimbili National Hospital. Of these, only 123 case notes were available for analysis. There were 55152 deliveries and therefore the incidence was 1/340 deliveries

Table 1 characteristics of study population

Information	Frequency	%
Age		
<20 years	3	2.4
20 – 29	90	73.2
>30-39 yrs	25	20.3
40+	5	4.1
Parity		
Para 1	3	2.4
Para 2-4	99	80.5
>Para 4	21	17.1
ANC attendance		
Yes	123	100
No	0	0
Source of admission into MNH Labor ward		
Home	22	17.9
Other health facilities	101	82.1
Place of diagnosis of RU		
At peripheral facilities	19	15.4
MNH labor ward	78	63.4
Intraoperatively	26	21.1

Table 1 indicates that most of ruptures occurred in women aged between 20 and 29 years (73.2%). Eighty-five percent of all cases were in their second to fourth parity when they succumbed the catastrophe. Majority of patients (82%) were referred from other health facilities with different diagnosis for the referral, some (15.4%) came with a confirmed diagnosis of ruptured uterus. All patients attended antenatal clinic at least once.

Table 2. Incidence and case fatality rates of ruptured uterus from 2003-2007 at MNH

Year	RU cases	RU cases died	Total deliveries per year	c/s rate (%)	Total maternal deaths	Incidence of RU	Case fatality rate(%)	RU contribution to maternal deaths(%)
2003	36	4	12254	25.8	60	1:340	11.1	6.7
2004	40	7	11543	31.5	69	1:289	17.5	10.1
2005	30	5	11377	27.1	58	1:379	16.7	8.6
2006	26	3	10229	30.8	32	1:393	11.5	9.4
2007	30	4	9749	36.8	36	1:324	13.3	11.1
Total	162	23	55152	30.1	255	1:340	14.2	9.2

Table 2 show that the incidence of ruptured has not changed significantly over five years (remained at above 1:320) .There had been a significant drop in the number of deliveries from 12254 in 2003 to 9749 in 2007 while caesarean section rate increased from about 26% to about 37%.

MUHIMBILI MEDICAL UNIVERSITY COLLEGE LIBRARY DSM.

Table 3 Causes of ruptured uterus at MNH

Causes	Frequency	%
Obstructed labor	54	37.8
Previous c/s scar	48	33.6
Misoprostol alone	11	8.9
Oxytocin alone	9	7.3
Misoprostol /oxytocin	14	11.4
Previous RU	4	2.8
Previous myomectomy	3	2.1

Table3 indicates that obstructed labor was the leading etiological factor of ruptured uterus (37.8% of all cases of ruptured uterus). Previous caesarean section was next to obstructed labor as a major cause of ruptured uterus and was responsible for 33.6% of rupture of the uterus. Other uterine ruptures were related to use of misoprostol for induction of labor (8.9%), use of oxytocin for induction/augmentation of labor (7.3%), previously repaired ruptured uterus (2.8%) and previous myomectomy scars (2.1%).

MUHIMBILI MEDICAL UNIVERSITY COLLEGE LIBRARY DSM.

Table 4.Maternal/Fetal outcomes

Outcomes	Frequency	%
Maternal outcomes		
Died	15	12.2
Survived	108	87.8
Fetal outcome at birth		
Alive	8	6.5
Dead (SBF)	111	90.2
Macerated (SBM)	4	3.3
Fetal weights		
<2.5kgs	3	2.4
2.5-3.9kg	50	40.7
4+ kgs	61	49.6
No documentation	9	7.3
Overall fetal outcome		
Still births	115	93.6
Perinatal deaths	2	1.6
Survived	3	2.4
No doc on mothers file	3	2.4
Complications		
Sepsis	24	14.8
VVF	8	6.5
Bladder injury	4	3.3
Others	3	2.4

About half (49.6%) of the fetuses in this study weighed more than 4kgs.

There were 15 maternal deaths and 117 fetal/perinatal deaths documented making the case fatality rates of 12.2% and 95.2% respectively. VVF was the most common complication, which occurred in 8 patients (6.5%of all patients with RU)

Table 5.Surgical findings

Intervention	Frequency	%
Surgical procedure		
Total hysterectomy	3	2.4
Subtotal hysterectomy	82	66.7
Rent repair only	14	11.4
Rent repair and sterilization	24	19.5
Surgeon		
Specialist/consultant	77	62.6
Resident/registrar	46	37.4
Type of rupture		
Complete	96	78
Incomplete	27	22
Blood loss		
<1000mls	2	1.6
1000-<1500mls	6	4.9
1500-<2000mls	48	39
>2000mls	67	54.5

Subtotal hysterectomy was the most common performed procedure (66.7%). Rent repair with sterilization (Bilateral tubal ligation) was done in 19.5% and rent repair only was done in 14.4% of cases. Total abdominal hysterectomy was done in 2.4% of cases. This

table also shows that most of the operations were done by specialists and/or consultants.(62.6%)

In most cases, the blood loss was in excess of 2000mls (54% of cases). However in 2 cases the blood loss was reported to be less than 1000mls

DISCUSSION

Rupture of a gravid uterus is a common obstetric hazard in many developing countries, Tanzania included. Many hospital-based studies done in different institutions in different countries have given a wide range of variability in the incidence of ruptured uterus among Hospital deliveries[1].

In this study, the incidence was found to be 1:340 deliveries which appears to be lower than those from a similar study in Ethiopia where the incidence was found to be 1:110.One study from Pakistan gave the incidence of 1:100 while a similar study in Nigeria reported the incidence of 1:273[2,7,27] .In this study the incidence is far higher when compared with that from a study in Nepal where the incidence was 1:1100 [11] .The difference could be explained by differences in delivery service coverage, accessibility of the facilities as well as availability of skilled personnel and medical supplies.

So far the incidence of ruptured uterus at Muhimbili National Hospital has not changed over time; it has remained high at around 0.3% over five years of analysis despite a significant drop in the number of deliveries. This reflects that the quality of maternity care has not improved or has even deteriorated over time at the institute. This calls for improvement of the services at MNH and peripheral hospitals.

Similar to other studies from developing countries, in this material ruptured uterus occurred much more frequently in unscarred uterus following obstructed labor (38.7%)[1,2,5]. The higher rate of rupture of a previous caesarean section scar found in this

study is in contrast to report from Singapore in which over two thirds of cases occurred in women with scarred uterus [6]. Referring municipal and district hospitals in Dar es salaam and Coastal region some times run short of medical supplies and power and therefore lack 24hours surgical services and can not offer comprehensive emergency obstetric care services therefore refer patients to Muhimbili National Hospital. This has contributed to delayed intervention before rupture, because of long queue for operations at Muhimbili National Hospital.

Pregnant women with scarred uterus have an obvious risk for rupture of the uterus during pregnancy and labor. These women therefore need a proper planning for timing and mode of delivery. In the present study, it was found that rupture of scarred uterus was second to obstructed labor as a cause of ruptured uterus. This explains deficiencies or delayed decision making in terms of planning for timing, mode of delivery as well as poor monitoring of labor.

Rupture of the uterus in primigravida is an uncommon phenomenon. In this study, most of the ruptures (80%) occurred in multipara women in their second to fourth parity. Only 3 (2.4%) of the ruptures occurred in primigravida. This finding is unusual but similar to those found by other studies done else where [2,7,11].Myometrial exhaustion followed by inertia that occurs in primigravida due to energy depletion and acidification in the myometrium following prolonged labor explains why rupture are rare as compared to multiparous women in whom the myometrium appears to be tolerant and continues to contract for longer periods of time. Of the three cases of ruptured uterus observed in this

study, one occurred due to induction of labor and two occurred following prolonged obstructed labor.

In this study all patients attended ANC at least once which means that there was an opportunity to plan for place, timing and mode of delivery. Rupture still occurred in these cases possibly because many patients with obvious risk factors attempt labor at home and therefore come to hospital late. This reflects poor quality antenatal care or inadequate information delivered to pregnant women on the part of health care providers and/or poor patient adherence to medical advice so given to them during antenatal clinic visits. Poor adherence may be a result of self, family or spouse influence in the course of trying to avoid operative delivery constituting a primary delay.

In the present study use of oxytocin and misoprostol were responsible for 8.9% and 7.3%% of all cases of ruptured uterus respectively. This appears to be significantly lower when compared to other studies in which oxytocin was found to cause 23 to 53% of ruptured uterus cases [7,27,37].In a similar study done in Ethiopia reports show that oxytocin contributed to 3.7% and 6% respectively. This shows that findings from the present study are far higher when compared to theirs. This calls for careful selection of cases and supervised use of these drugs. Induction of labor using oxytocin (pitocin, syntocinon) and prostaglandins (e.g. prostaglandin gel, prostin, and misoprostol) have been associated with increased risk of uterine rupture.[18].

Misoprostol for induction of labor has been in use at MNH for some time. The present study shows that misoprotol alone caused 8.9% of uterine ruptures which is a significant contribution. But this is lower when compared to that found at Hamad Medical Corporation women's hospital in Doha where misoprostol was reported to have caused 23.5% of ruptured uterus. Lack of proper protocols for the use of misoprostol coupled with poor monitoring of labor in our institution is contributory factors to the occurrence of rupture of the uterus among the induced group.

In the present study, ruptured uterus accounted for 9.2% of all maternal deaths that occurred during the study period. The case fatality rate of 12% found in this study appears to be low when compared to other studies done in some parts of developing countries. In Nigeria, India and Zambia case fatality rates were found to range between 18-44%[7,14,26]. Some researchers have even documented zero maternal deaths in their studies[27,19]. Findings from this study are comparable to those found in Ethiopia where the case fatality rate was 11.1%.[2] The differences so observed in maternal outcomes reflects differences in the quality of maternal health care provided in different countries.

The high perinatal case fatality rate found in this study (95.2%) concur with those from a similar study done in Ethiopia in which the case fatality rate was reported to be 98.1%.However it is relatively higher when compared to other studies done in different parts of developing countries where it ranged between 32-86%[1,5,7,11,35].The fetal outcome in ruptured uterus is determined by the time taken between diagnosis and operation,

presence of expertise as well as neonatal care. The high case fatality rate found in this study reflects delays in diagnosis and intervention.

Delay at making the diagnosis of ruptured uterus is an important predictor of fetal/maternal outcome and many times the diagnosis may be missed requiring imaging techniques like ultrasound[47]. In this study in some cases (21.1%) the diagnosis couldn't be made during labor and was made intraoperatively meaning that it might have compromised fetal/maternal outcome

The type of surgical intervention in ruptured uterus depends upon the site, extent as well as the experience of a surgeon. In this study subtotal hysterectomy appears to be the most preferred procedure possibly because ruptured uterus is an obstetric emergency that requires quick response to arrest bleeding and subtotal hysterectomy provides a quick means to achieve hemostasis. These findings are similar to other studies done elsewhere in developing countries.[7,27]. However, this is different from some studies in which total hysterectomy was the most common procedure[2]. Nearly 90% of patients in our study lost their reproductive and/or menstrual function following surgical interventions. Rupture of the uterus therefore has a grave socio-cultural implication especially in societies (Tanzania included) where these functions are considered the very essence of womanhood.

Infection following rupture of the uterus is a common sequel because prolonged labor predisposes to infection due to the fact that there are usually repeated pelvic examinations due to poor progress of labor. Once infection occurs in ruptured uterus it easily spreads to the peritoneal cavity and systemic infection may follow. This calls for prophylactic antibiotics pre and post operative periods in all cases of ruptured uterus to prevent development of overt sepsis. In the present study 14.4% of cases had clinically diagnosed sepsis. This is slightly lower when compared to a similar study done in Ethiopia in which sepsis was diagnosed in 18.3% of cases studied[2].Other morbidities found in this study were vesicle-vaginal fistula, bladder injuries and foot drop.

In the present study most of the operations (62.7%) were done by obstetricians (consultants or specialists) which shows that ruptured uterus is a serious obstetric emergency that requires adequate experience, urgency and speed in performing massive bleeding operations.

The majority (78%) of patients had complete rupture of the uterus and urinary bladder injury was the most frequently associated genitourinary injury. These findings are similar to other studies done in different parts of the world[2,14].

Our study observed a caesarean section rate of about 30% of all deliveries during the study period. These results compare to findings from a study done in this institution in which the caesarean section rate was found to be 29.5% [46].Also these findings are comparable to those found in Pakistan in which the caesarean section rate was reported to

be 32.8%. However our caesarean section rate is higher as compared to findings in Nepal where the caesarean section rate was 11% [11,27].Our higher caesarean section rate could probably be due to the fact that this is referral hospital receiving patients requiring operative intervention from Coastal and all district hospitals in Dar es Salaam.

However it is a fact that we have observed an increase of caesarean section rate from about 26% in 2003 to about 37% in 2007 while the number of deliveries dropped significantly during the same period. Critical analysis of the indication for the caesarean section may help reduce this alarming caesarean section rate. In a study done previously in this institute it was indicated that up to one-third of all caesarean section done could have been avoided if the decisions for the operation were critically made according to diagnostic criteria[46].This likely to be the result of poor supervision of junior doctors by specialists. Also lack of comprehensive emergency obstetric care at the municipal hospitals coupled with the introduction of intramural private practice within the hospital may have contributed to the rise of the rate of caesarean delivery over time.

In the present study about a quarter of patients files were not found for analysis and even further some of the found files missed details like fetal outcome which might have an impact on the results. Proper patients records keeping in an institution is of critical importance when it comes to patients follow-ups during subsequent visits, research purposes or even in medical legal issues.

Duration of labor is an important predictor of labor outcome because it document the times at which important events during labor are found. In the present study this parameter could not be analyzed because most of the cases of ruptured uterus came as referral cases from peripheral hospitals with poor documentation of times at which examinations were done. This calls for addressing the issue of proper documentation both at the peripheral hospitals and MHN.

Most of cases in the present study came to MNH as referrals from municipal hospitals in dare s salaam or coast region. This reflects inability of these referring facilities to offer comprehensive obstetric care services coupled with poor monitoring of labor leading to delayed intervention. There for any effort to lower the incidence of RU with its complications at the MNH should involve improvement of quality of services at these referring facilities.

Findings from this study might not reflect the Dare s salaam region or country's situation at large and may have reported a higher incidence based on the fact that Muhimbili is a tertiary referral hospital receiving obstetric emergence cases from all around Dar es Salaam and coastal region. Further more, it could have underreported the magnitude of case fatality rate based on the fact that the study was done in a consultant hospital with staff capable of performing obstetric emergency operations as compared to peripheral facilities in Dare s salaam as well as remote and hard to reach areas of the country.

CONCLUSION

The incidence of ruptured uterus at Muhimbili National Hospital is high and contributes significantly to both maternal and fetal morbidities and mortalities .The leading causes of ruptured uterus are obstructed labor, previous caesarean section scars and use of uterotonic drugs for induction and/or augmentation of labor. Others were previously ruptured uterus and myomectomy scars. Most of these patients were referred from municipal hospitals in Dare s salaam and coastal regions. Proper monitoring of labor both in these referring facilities and at MNH will contribute to the reduction of these morbidities and mortalities.

RECCOMENDATIONS.

1. Identification of at risk women during antenatal clinics such as those with previous caesarean section scar, big babies and/or contracted pelvises so as planned for elective caesarean section at term.

2. Strengthening the District Hospital in Dar es Salaam and coast region to have 24 hours comprehensive obstetric care facilities.

3. Improve monitoring during labor in municipal hospitals and MNH in order to prevent obstructed labor and side effects of uterotonic drugs..

4. Formulating clear protocol for induction and/or augmentation of labor with uerotonic drugs.

5. Improve record keeping particularly patients files and other important patient's documents/information

6. Prospective study is highly recommended so that most patients' information can be available for analysis.

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