

Ruptured Uterus in a Tropical Teaching Hospital: Choice of Surgical Treatment versus Maternal Outcome

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Received 15 November 2007; received in revised form 15 November 2007; accepted 19 July 2008;
published online 01 September 2008

Abstract

Objective: Ruptured uterus is an obstetric emergency associated with high maternal and fetal mortality. The outcome is worsened in sub-Saharan Africa because of delay in treatment. We aimed to evaluate uterine rupture cases and their outcome with respect to surgical choice.

Materials and Methods: A 15 years retrospective re-appraisal of ruptured gravid uterus in a tertiary hospital, with emphasis on choice of surgical treatment and maternal outcome.

Results: During the study period 131 cases of ruptured uterus were recorded and 21 905 deliveries took place, giving a ratio of 1 ruptured gravid uterus in every 167 deliveries. A significant percentage of the patients were illiterate (71%), unbooked for antenatal care (77.9%) and belonged to the low social class (58.8%). Types of rupture were mainly spontaneous rupture (64.1%), followed by scar rupture (26%) and traumatic uterine rupture (9.9%). Of the 130 cases that had surgery, 110 (84.6%) had repair with or without tubal ligation and 20 (15.4%) had hysterectomy. Ninety-nine (90%) out of the 110 repair surgeries were done by resident doctors and 19 (95%) out of the 20 hysterectomies were done by the consultant staff. Maternal mortality and morbidity were 25.2% and 94.9% respectively, mainly due to sepsis and anaemia. The maternal mortality and morbidity were significantly high in the repair group and was lowest in the group that had subtotal hysterectomy. Twenty-eight (84.8%) of the total 33 maternal deaths occurred in the post-operative period.

Discussion: Taking into consideration that most patients are unbooked for antenatal care and are referred with established sepsis and anaemia, sub-total hysterectomy seems to be a better surgical treatment for cases of ruptured uterus in resource poor settings like ours.

Keywords: uterine rupture, surgical treatment, maternal outcome

Özet

Tropik Bir Eğitim Hastanesinde Uterus Rüptürleri: Cerrahi Seçenek ile Maternal Sonuç Arasındaki İlişki

Amaç: Uterus rüptürü yüksek maternal ve fetal morbidite ile ilişkilidir. Sahra-altı Afrika bölgesindeki sonuçlar tedavideki gecikmelere bağlı olarak daha da kötüleşmektedir. Bu çalışmada, uterus rüptürlerinin sonuçlarını tercih edilen cerrahiye göre değerlendirmeyi amaçladık.

Materyal ve Metot: Tersiyer bir referans merkezinde gerçekleşen 15 yıllık uterus rüptürleri retrospektif olarak değerlendirildi ve sonuçları tercih edilen cerrahi yönteme göre araştırıldı.

Sonuçlar: Araştırılan zaman aralığında 21 905 doğum oldu ve 131 uterus rüptürü kaydedildi ve bu da her 167 doğumda bir uterus rüptürüydü. Hastaların önemli bir kısmı okuma yazma bilmiyordu (%71), hiç antenatal bakım almamışlardı ve düşük sosyoekonomik sınıftaydılar (%58.8). Uterus rüptürlerinin çoğu, spontan gelişmişti (%64.1); bunu scar rüptürü (%26) ve travmatik rüptür (%9.9) izlemekteydi. Cerrahi tedavi alan 130 olgunun 110'unda tüp ligasyonlu ve tüp ligasyonsuz uterus tamiri yapılırken, 20 olguya (%15.4) histerektomi yapıldı. Yüz on uterus onarımının 99'u (%90) asistan doktorlar tarafından yapılırken, 20 histerektominin 19'u (%95) tecrübeli konsültanlar tarafından uygulandı. Maternal mortalite %25.2 ve morbidite %94.9 idi ve en sık sebepler sepsis ve anemiydi. Maternal morbidite ve mortalite en sık olarak uterus onarımı grubunda izlenirken, subtotal histerektomi grubunda en düşük orandaydı. Toplam 33 maternal ölümün 28'i (%84.8) postoperatif dönemde oluştu.

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Tartışma: Hastaların hiç antenatal bakım almadığı ve refere edildiklerinde zaten sepsis ve aneminin geliştiği göz önüne alınırsa, bizimki gibi kısıtlı imkânların olduğu yerlerde uterus rüptürünün yönetiminde subtotal histerektomi daha iyi bir seçenek gibi görülmektedir.

Anahtar sözcükler: uterus rüptürü, cerrahi tedavi, maternal sonuçlar

Introduction

In most developing countries, the maternal and reproductive health care system is not well established. Health indices indicating the quality of maternal and reproductive health confirmed high figures in Nigeria. The maternal mortality ratio in Nigeria is estimated at 800 maternal deaths per 100 000 live births in the year 2000. Nigeria with about 2 percent of the world's population contributes about 10% of the global burden of maternal mortality (1).

Rupture of the gravid uterus is a significant contributor to maternal mortality in Nigeria. Study (2) from South East Nigeria, reported ruptured uterus as the leading cause of maternal mortality, accounting for about 31.9% of the maternal deaths. Maternal outcome from ruptured uterus is determined mainly by promptness of resuscitation and definitive management, availability of blood transfusion, competent surgical intervention and adequate anaesthesia (2). Against this background, this study was carried out toward finding the appropriate choice of surgical treatment in relation to maternal outcome, in the context of a resource-constrained settings we operate in.

Materials and Methods

A retrospective study out in a tropical teaching hospital on patients that had rupture of a gravid uterus from January 1990 through to December 2004 was carried out. During the 15 years study period, 21 905 deliveries and 131 cases of uterine rupture were recorded. Their case files were reviewed and analysed for necessary information.

For this study, booked patients implies those patients that had antenatal care in private or primary, secondary and tertiary health facilities. Prolonged hospital stay signifies post-operative hospital stay beyond eight days.

The patients were categorised into 3 groups, those with spontaneous, traumatic and previous uterine scar rupture of the uterus.

Results

During the 15 year study period, 21 905 deliveries were recorded of which 131 of these involved ruptured uterus. This gives on overall incidence of 1 ruptured uterus for every 167 deliveries. The patients' age ranged from 19 to 46 years with a mean age of 37.3 years (Table 1). The rate of ruptured uterus increased with parity, 45% (59 patients) of the patients were para 4 and above. In this study, there was no case of ruptured

uterus recorded in a primigravida. With the exception of 3 twin pregnancies, others were singleton pregnancies.

Of the 131 patients, 93 (71%) had no form of western education (illiterate) while 38 (29%) patients had some form

Table 1. Patient profiles

Variable	n=131	(%)
Age (Years)		
<20	4	3.1
21-30	39	29.8
31-40	65	49.6
41-50	23	17.6
Parity		
0	0	0
1	10	7.6
2	15	11.5
3	47	35.9
>4	59	45.0
Educational status		
Illiterate	93	71
Literate	38	29
Booking status		
Booked	29	22.1
Unbooked	102	77.9
Socio-economic class		
Low	77	58.8
Middle	38	29.0
High	16	12.2

Table 2. Types and causes of uterine rupture

	n=131	(%)
Spontaneous uterine rupture		
• Cephalopelvic disproportion	59	45.0
• Malpresentation/abnormal lie	25	19.1
Traumatic uterine rupture		
• Oxytocin use	9	6.9
• Assisted vaginal delivery	3	2.3
• Manual removal of placenta	1	0.8
Scar rupture		
• Caesarean Section	30	22.9
• Myomectomy	1	0.8
• Previous repair of uterine rupture	2	1.5
• Hysterotomy	1	0.8

Table 3. Choice of surgery and cadre of primary surgeon

	Resident doctor	Consultant	n=130
Repair only	33	6	39 (30.0)
Repair with tubal ligation	66	5	71 (54.6)
Subtotal hysterectomy	1	13	14 (10.8)
Total Hysterectomy	0	6	6 (4.6)

*n=130, excludes the patient that died undelivered.

of western education (Table 2). The booking status of the patients, showed that 102 (77.9%) patients did not have their pregnancies supervised while 29 (22.1%) received formal antenatal care. The economic status of the patients revealed that 77 (58.8%) patients belongs to the low social class bracket while 38 (29%) and 16 (12.2%) patients were in the middle and high social class respectively.

Distribution of patients, showed that 84 (64.1%) had spontaneous rupture of the uterus, 13 (9.9%) patients had traumatic uterine rupture and 34 (26%) patients had rupture of a previously scared uterus (Table 3). Of the 9 patients with traumatic uterine rupture, 2 had previous caesarean scar. Eighty four (64.1%) patients had spontaneous uterine rupture, 15 (45%) cases were secondary to cephalopelvic disproportion and 25 (19.1%) cases followed malpresentation/abnormal lie. Oxytocin use for induction or augmentation of labour accounted for 6.9% (9 patients) of the cases, ruptured uterus occurred in 6 of the patients due to injudicious use of oxytocin drip and the remaining 3 patients had cervical ripening with prostaglandin (dinoprostone) tablets.

Of the 3 (2.5%) cases that had assisted vaginal delivery, uterine rupture followed craniotomy and delivery in 1 patient while the remaining 2 cases followed forceps delivery. Manual removal of the placenta, done in the labour ward due to torrential bleeding, resulted into rupture of the uterus in 1 (0.8%) patient.

Ruptured uterus in patients with previous uterine scar accounted for 26% (34 patients) of the cases; this followed caesarean section in 39 (22.9%) patients, myomectomy 1 (0.8%) patient, previous repair of uterine rupture 2 (1.5%) patients and hysterotomy in 1 (0.8%) patient.

Surgical treatments offered were repair with tubal ligation in 71 (54.2%) patients; repair alone in 39 (29.8%) patients, subtotal hysterectomy in 14 (10.7%) patients and total hysterectomy in 6 (4.6%) patients. Of the 110 repair surgery with or without tubal ligation, 99 were done by resident doctors while the consultant cadre of staff performed 19 out of the 20 hysterectomies. The maternal and fetal mortality were 25.2% and 88.8% respectively while maternal and fetal morbidity were 94.9% (93 of the 98 remaining patients) and 100% respectively.

Table 4 shows that 28 (84.8%) of the 33 maternal deaths occurred in the post-operative period, and overwhelming sepsis (57.6%) with anaemia (33.3%) were the leading causes of maternal deaths. Various manifestations and complications of sepsis and anaemia and blood transfusion were responsible for most of the maternal morbidities.

There was no mortality recorded in the group of patients that had subtotal hysterectomy and low mortality (16.7%) occurred in the group that had total hysterectomy when compared to incidences of 33.3% and 25.4%, respectively, recorded for repair and repair with tubal ligation (Table 5). Similarly maternal morbidity was significantly low in the group that had hysterectomy when compared to repair with or without tubal ligation. However, in the group that had total hysterectomy, all the 6 (100%) patients had anaemia with blood transfusion and the only case of vesicovaginal fistula/rectovaginal fistula occurred in one of the patients belonging to this group.

Maternal survival rate was highest in the group that had subtotal hysterectomy (100%). This was followed by rates of 83.3% for total hysterectomy, 74.6% repair with tubal ligation and 71.8% for repair alone.

Discussion

Rupture of the gravid uterus continues to be one of the serious life threatening complication of pregnancy (3,4). Its effect is more profound in Nigeria, because ours is a setting with limited resources. More so, that most of the patients

Table 4. Maternal outcome

	n=131	(%)
Maternal mortality	33	25.2
• Intra-operative	4	12.1
• Post-operative	28	84.8
• Pre-operative	1	3.0
Causes of maternal death	33	25.2
• Overwhelming sepsis	19	57.6
• Sepsis with anaemia	11	33.3
• Anaemia with shock	2	6.1
• Coagulopathy	1	3.0
Maternal morbidity	98	74.8
Causes of maternal morbidity	93	94.9
• Wound sepsis/disruption	62	66.7
• Genital sepsis	49	52.7
• Pelvic abscess	13	14.0
• Anaemia/blood transfusion	88	94.6
• Vesicovaginal fistula	1	1.1
• Rectovaginal fistula	1	1.1
• Puerperal psychosis	11	11.8
• Prolongued hospital stay	37	39.8

*n: number; %: percentage.

Table 5. Type Of Surgery and maternal outcome

	Repair alone	Repair and TL	Subtotal hysterectomy	Total hysterectomy
	n=39	n=71	n=14	n=6
Maternal mortality	13 (33.3%)	18(25.4%)	0 (0.0%)	1 (16.7%)
Maternal death cause	n=13	n=18	n=0	n=1
Overwhelming sepsis	8 (61.5%)	11(61.1%)	0 (0.0%)	0 (0.0%)
Sepsis and anaemia	5 (38.4%)	5 (27.8%)	0 (0.0%)	0 (0.0%)
Anaemia and shock	0 (0.0%)	1 (5.6%)	0 (0.0%)	1 (100%)
Coagulopathy	0 (0.0%)	1 (5.6%)	0 (0.0%)	0 (0.0%)
Maternal morbidity	n=26	n=53	n=14	n=5
Wound sepsis/disruption	24 (92.3%)	33(66.0%)	3 (21%)	2 (40%)
Genital sepsis	21 (80.8%)	27(50.9%)	1 (7.1%)	0 (0.0%)
Pelvic abscess	5 (19.2%)	8 (15.1%)	0 (0.0%)	0 (0.0%)
Puerperal psychosis	3 (11.5%)	8 (15.1%)	0 (0.0%)	0 (0.0%)
Anaemia/blood transfusion	23 (88.5%)	49(92.4%)	10 (71.4%)	5 (100%)
Prolonged hospital stay	13 (50.0%)	23(43.4%)	0 (0.0%)	1 (20%)
VVF	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (20%)
RVF	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (20%)
Maternal survival rate	66.7%	74.6%	100%	83.3%

*VVF: vescio-vagina fistula; RVF: recto-vaginal fistula; TL: tubal ligation.

with ruptured uterus are illiterate and multigravida, belonging to the low socio-economic class. It is not therefore surprising why a significant percentage of the patient, mainly with spontaneous uterine rupture, were not previously booked for antenatal care. This finding is in concordance with reports from other authors (2) from the same country.

Controversies still exists among obstetricians as to the operative procedure of choice for ruptured uterus (8,9). This study recorded significantly high rates of repair with or without sterilization. Unarguably, the type of surgery embarked upon is mainly dependent on the surgeon's experience and the socio-cultural background of the patients. Most of the repair procedures were done by the resident doctors and for socio-cultural reasons, most Nigerian women want to maintain their reproductive ability.

The best procedure for ruptured uterus is the one which is the shortest in duration and which will not exacerbate the patients' state of shock and will get the patient off the operating table in the best condition (10). Consequent to these factors, repair procedure is seemingly favoured, with or without sterilization. However, in the context of our environment of practice, it is not always easy to perform repair operation as reported by another author (11) from the same region. More so, that most of our patients are referred with anaemia and established sepsis. The uterine walls are usually friable and approximation of the edges may be difficult which may result in exacerbation of post-operative sepsis due to leakage of lochia into the peritoneal cavity. Healing of the repaired uterus may also be compromised due to sepsis, and this can further be

compounded by post-operative anaemia due to inadequate blood transfusion services, frequently encountered in our setting.

Hysterectomy, which has not been readily employed in this study, amongst other reasons has been recommended in cases where the patient is infected due to delay, as commonly seen in Africa (12). The low rate of hysterectomy in this study maybe due to lack of competence on the surgeons' side. This is corroborated in this study by the finding that most of the hysterectomies were done at the level of the consultant cadre. When considering the time taken by the surgical process, the time required to accomplish a subtotal hysterectomy may not differ remarkably from that of the repair procedure, in the hand of an experienced surgeon.

Although, Schrinisky (13,14) suggested that if hysterectomy is deemed fit as the procedure of choice, total hysterectomy is better because of future development of invasive disease of the cervix. On the other hand, total hysterectomy may comparatively take a longer time and may be associated with more haemorrhage and urinary tract complications when compared to subtotal hysterectomy. In this study, the only case of VVF and RVF recorded, occurred in a patient that had total hysterectomy, furthermore all the patients that had total hysterectomy had anaemia requiring blood transfusion.

In this series, maternal mortality of 25.2% recorded is in the range of quoted figures from other studies in Nigeria (15,16). Significant percentage of maternal deaths were recorded in the post-operative period and complications of overwhelming sepsis and anaemia were mainly responsible. Similarly, sepsis and shock were the two leading cause of mortality in

another study (7,11,17). More importantly, we recorded high rate of mortality with repair procedure than with hysterectomy in this study. Also, maternal morbidity which was mainly linked to sepsis and anaemia were significantly more in patients who had had the repair procedure.

It will suffice to say from our finding that hysterectomy may be a better operative choice for ruptured uterus in our setting considering the peculiarities of these patients at presentation. Some authors (2,7,11) reporting from within and outside Nigeria recorded better outcome with subtotal hysterectomy due to removal of the infected and torn uterus.

In conclusion, it is not enough to perform the easiest and shortest procedure for the patients as recommended by some authors (3) instead an adequate surgery that will improve the post-operative recovery and outcome should be done. That is to say, a procedure that will not worsen sepsis and will not constitute extra demand on the system for healing in an already anaemic patient. In a retrospective audit of hysterectomies in the same city where this study was carried out, it was found that 89.4% of the hysterectomies was performed by surgeons of the consultant cadre (18). Early exposure of the resident doctors and acquisition of necessary skills to perform hysterectomy will help a long way in the management of uterine rupture in sub-Saharan Africa.

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