



Research Article

MANAGEMENT AND OUTCOMES OF UTERINE RUPTURE AT A REGIONAL REFERRAL HOSPITAL IN SENEGAL

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Abstract

Uterine rupture remains a major obstetric emergency in resource-limited settings. This study described its epidemiological, clinical, therapeutic, and prognostic features at the El Hadji Ibrahima Niass Regional Hospital in Kaolack, Senegal. We conducted a retrospective descriptive and analytical study including all uterine ruptures diagnosed and managed between 1 January 2021 and 31 December 2022. Data were extracted from medical records and analysed using SPSS version 20.0. Among 11,290 deliveries, 51 uterine ruptures were identified, corresponding to a hospital frequency of 0.45%. The estimated mean age was 30.2 years (range 20-42), 58.8% of women were multiparous or grand multiparous, and 92.2% were referred from another facility. Rupture occurred in an unscarred uterus in 60.8% of cases and was complete in 88.2%. Conservative uterine repair was performed in 70.6%, whereas 29.4% underwent hysterectomy. Twelve maternal deaths occurred, yielding a case fatality rate of 23.5%; fetal mortality was 78.4%. In bivariate analysis, maternal death was associated with parity ($p = 0.028$), mode of delivery ($p = 0.004$), and type of surgery ($p < 0.001$). Uterine rupture was associated with very high maternal and fetal mortality. Earlier diagnosis and referral, rigorous labour monitoring, and immediate access to surgery, resuscitation, and blood products are priorities.

Keywords: Uterine rupture, Obstetric emergency, Maternal mortality, Fetal mortality, Laparotomy, Senegal.

INTRODUCTION

Uterine rupture is a non-surgical disruption of the wall of the pregnant uterus. It is a rare obstetric complication in high-income countries, where it occurs mainly in scarred uteri, but remains more frequent in resource-limited settings [1-5]. It may cause massive haemorrhage, shock, hysterectomy, maternal death, and high perinatal mortality [3-6]. In sub-Saharan Africa, rupture of an unscarred uterus continues to be reported and is associated with prolonged obstructed labour, delays in referral, inadequate labour monitoring, grand multiparity, and inappropriate use of uterotonic agents [6-12]. In Senegal, hospital frequencies vary according to referral level and the organisation of access to emergency obstetric care [6,7]. Understanding patient profiles, anatomical lesions, treatment, and outcomes is essential to guide prevention. This study aimed to analyse the epidemiological, clinical, therapeutic, and prognostic features of uterine rupture at the El Hadji Ibrahima Niass Regional Hospital in Kaolack.

MATERIALS AND METHODS

Study design, setting, and period

This retrospective descriptive and analytical study was conducted in the Department of Obstetrics and Gynecology of the El Hadji Ibrahima Niass Regional Hospital in Kaolack, Senegal, from 1 January 2021 to 31 December 2022.

Study population

All cases of uterine rupture diagnosed and managed in the department were included, irrespective of the mode of delivery. Cervical tears that did not extend to the lower uterine segment or uterine body, and ruptures caused by abortion procedures or trauma, were excluded.

Data collection and variables

Data were extracted from medical records using a standardised form and entered into Sphinx Demo V. Variables included age, parity, antenatal care attendance, gestational age, mode of admission, surgical history, uterine scar status, onset of labour, presentation, mode of delivery, birth weight, anatomical lesions, treatment, and maternal and fetal outcomes. Because individual ages were unavailable, the mean age was estimated from the midpoints of the two recorded age groups (20-30 and 31-42 years), weighted by their respective frequencies.

Operational definitions

An unscarred uterus was defined as having no previous full-thickness surgical uterine incision. A uterus with one or at least two scars had previously been opened through its full wall thickness once or at least twice, respectively. Conservative repair was defined as suturing the rupture while preserving the uterus; hysterectomy was defined as surgical removal of the uterus.

Statistical analysis

Data were analysed using SPSS version 20.0. Categorical variables are reported as frequencies and percentages. Bivariate analysis used the chi-square test or Fisher's exact test for categorical variables. Statistical significance was set at $p < 0.05$. Given the small sample and sparse cells, associations were considered exploratory and no multivariable analysis was performed.

Ethical considerations

Confidentiality and anonymity of data extracted from medical records were maintained throughout the study.

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RESULTS

Frequency and patient characteristics

During the study period, 51 uterine ruptures were recorded among 11,290 deliveries, corresponding to a hospital frequency of 0.45% (one rupture per 221 deliveries). The estimated mean age was 30.2 years, with a range of 20 to 42 years. Women aged 20-30 years accounted for 54.9% of cases. Multiparous and grand multiparous women together represented 58.8% of the sample. More than half of the women (54.9%) had attended fewer than four antenatal consultations.

Table 1. Sociodemographic and obstetric characteristics (N = 51)

Characteristic	n	%
Age 20-30 years	28	54.9
Age 31-42 years	23	45.1
Primiparous	10	19.6
Pauciparous	11	21.6
Multiparous	23	45.1
Grand multiparous	7	13.7
No antenatal consultation	2	3.9
1-3 antenatal consultations	26	51.0
≥4 antenatal consultations	23	45.1

Obstetric and anatomical characteristics

Forty-seven women (92.2%) were referred from another facility, whereas four (7.8%) presented directly. Pregnancy was at term in 42 women (82.4%) and post-term in nine (17.6%); no preterm case was recorded. Labour began spontaneously in 78.4%. Rupture involved an unscarred uterus in 60.8%, was segmentocorporeal in 58.8%, and was complete in 88.2%. An associated cervical or vaginal tear occurred in 33.3%.

Table 2. Obstetric and anatomical characteristics (N = 51)

Characteristic	n	%
Referred from another facility	47	92.2
Direct presentation	4	7.8
Term pregnancy	42	82.4
Post-term pregnancy	9	17.6
Unscarred uterus	31	60.8
One uterine scar	18	35.3
At least two uterine scars	2	3.9
Spontaneous labour	40	78.4
Induced labour	11	21.6
Segmental rupture	15	29.4
Corporal rupture	6	11.8
Segmentocorporeal rupture	30	58.8
Incomplete rupture	6	11.8
Complete rupture	45	88.2
No associated tear	34	66.7
Cervical tear	15	29.4
Vaginal tear	2	3.9

Management and outcomes

All women underwent laparotomy and received resuscitative care. Fetal extraction was performed during laparotomy in 43 cases (84.3%); in eight cases (15.7%), rupture was diagnosed after vaginal delivery. Conservative uterine repair was performed in 70.6%, whereas 29.4% underwent hysterectomy. Forty women (78.4%) received blood transfusion. Twelve maternal deaths occurred, corresponding to a case fatality rate of 23.5%. Fetal mortality was 78.4%, including 70.6% fresh stillbirths.

Table 3. Management and maternal and fetal outcomes (N = 51)

Characteristic	n	%
Laparotomy	51	100.0
Fetal extraction during laparotomy	43	84.3
Vaginal delivery before diagnosis	8	15.7
Conservative uterine repair	36	70.6
Hysterectomy	15	29.4
Blood transfusion	40	78.4
Severe anaemia	40	78.4
Postpartum infection	2	3.9
Maternal death	12	23.5
Live birth	11	21.6
Fresh stillbirth	36	70.6
Macerated stillbirth	4	7.8

Exploratory bivariate analysis of maternal death

Maternal death was associated with parity ($p = 0.028$), mode of delivery ($p = 0.004$), and type of surgery ($p < 0.001$). No statistically significant association was observed with mode of admission, number of antenatal consultations, or type of rupture. These unadjusted findings should be interpreted cautiously because the small number of deaths and sparse categories limit precision. Mode of delivery and hysterectomy may primarily reflect delayed diagnosis or greater initial severity.

Table 4. Factors associated with maternal death in bivariate analysis (N = 51)

Variable and category	Deaths n	Survivors n	p value
Parity: primiparous / pauciparous / multiparous*	0 / 2 / 10	10 / 9 / 20	0.028
Admission: referred / direct	11 / 1	36 / 3	0.944
Antenatal consultations: 0 / 1-3 / ≥4	1 / 5 / 6	1 / 21 / 17	0.973
Delivery: vaginal / laparotomy	5 / 7	3 / 36	0.004
Rupture: incomplete / complete	0 / 12	6 / 33	0.315
Surgery: conservative repair / hysterectomy	2 / 10	34 / 5	<0.001

*Multiparous category includes multiparous and grand multiparous women.

DISCUSSION

This hospital-based study identified 51 uterine ruptures among 11,290 deliveries, corresponding to a frequency of 0.45%. This frequency exceeds that generally observed in high-income countries but is consistent with several hospital series from Africa [1-12]. It should not be interpreted as a population incidence because the regional referral setting and very high proportion of referred women probably selected the most severe cases. Multiparous and grand multiparous women accounted for 58.8% of cases, consistent with several African series [6-12]. Multiparity may increase cumulative exposure to obstructed labour, uterine stimulation, and obstetric manoeuvres. However, this study had no control group without uterine rupture and therefore cannot estimate an independent causal effect of parity. Likewise, 54.9% had attended fewer than four antenatal consultations, but consultation frequency was not associated with maternal death in the bivariate analysis. Unscarred uteri accounted for 60.8% of ruptures, contrasting with high-income settings where a previous caesarean scar is the leading context [1-5]. This finding may reflect persistent obstructed labour, inadequate labour monitoring, and delayed access to caesarean delivery. Nevertheless, 39.2% of women had at least one uterine scar, underscoring the need for careful selection and close monitoring of labour after previous uterine surgery.

The very high proportion of referred women (92.2%) is a central finding. It reflects the referral role of the hospital but may also indicate delays in recognising dystocia, deciding on transfer, or accessing the operating theatre. The absence of an association between referral and death does not exclude an effect of delays because only four women presented directly and time-to-care data were unavailable. Complete (88.2%) and segmentocorporeal (58.8%) ruptures predominated, indicating severe lesions. Conservative repair was nevertheless possible in 70.6%. Hysterectomy was strongly associated with death in bivariate analysis, but this should not be interpreted as a harmful effect of the procedure. Hysterectomy is a life-saving intervention selected for extensive injury, uncontrolled haemorrhage, or haemodynamic instability; confounding by indication is therefore likely.

The maternal case fatality rate of 23.5% and the prevalence of severe anaemia (78.4%) confirm the burden of haemorrhage. Blood transfusion was required in 78.4%. These findings support immediate resuscitation in parallel with surgery and permanent availability of blood products [13-15]. Fetal mortality reached 78.4% and consisted mainly of fresh stillbirths, consistent with acute interruption of uteroplacental exchange and substantial diagnostic or therapeutic delays.

Strengths and limitations

This study provides detailed information on lesions, treatment, and outcomes in a regional Senegalese hospital. Its limitations include the retrospective, single-centre, hospital-based design; small sample; absence of a control group and multivariable analysis; estimation of mean age from grouped data; and unavailable information on referral and treatment delays, initial haemodynamic status, haemoperitoneum volume, and uterotonic use. The observed associations are exploratory and do not identify independent prognostic factors.

Conclusion

Uterine rupture remains a severe obstetric emergency at the El Hadji Ibrahima Niass Regional Hospital in Kaolack, with a maternal case fatality rate of 23.5% and fetal mortality of 78.4%. The predominance of referred cases, unscarred uterine ruptures, and complete lesions suggests a major contribution of diagnostic and therapeutic delays. Prevention requires early identification of high-risk pregnancies, rigorous labour monitoring, safe use of uterotonic agents, timely referral, and continuous access to surgery, anaesthesia and critical care, and blood products. Prospective multicentre studies incorporating the different delays in care are needed.

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List of abbreviations: SPSS: Statistical Package for the Social Sciences.

REFERENCES

1. Fitzpatrick, K.E., Kurinczuk, J.J., Alfirevic, Z., Spark, P., Brocklehurst, P. and Knight, M., "Uterine rupture by intended mode of delivery in the UK: a national case-control study", *PLoS Medicine*, 9(3), e1001184, March 2012.
2. Landon, M.B., Hauth, J.C., Leveno, K.J., Spong, C.Y., Leindecker, S., Varner, M.W., et al., "Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery", *New England Journal of Medicine*, 351(25), 2581-2589, December 2004.
3. Kaczmarczyk, M., Sparén, P., Terry, P. and Cnattingius, S., "Risk factors for uterine rupture and neonatal consequences of uterine rupture: a population-based study of successive pregnancies in Sweden", *BJOG*, 114(10), 1208-1214, October 2007.
4. Guyot, A., Carbonnel, M., Frey, C., Pharisien, I., Uzan, M. and Carbillon, L., "Rupture utérine: facteurs de risque, complications maternelles et fœtales", *Journal de Gynécologie Obstétrique et Biologie de la Reproduction*, 39(3), 238-245, May 2010.
5. Tinelli, A., "Uterine rupture: up to date", *Journal of Interdisciplinary Research Applied to Medicine*, 1(1), 61-74, 2017.
6. Cissé, C.T., Faye, E.O., de Bernis, L. and Diadhiou, F., "Rupture utérine au Sénégal: épidémiologie et qualité de la prise en charge", *Médecine Tropicale*, 62(6), 619-622, 2002.
7. Gueye, L., Thiam, M., Niang, M.M., Sarr, F.R. and Moreau, J.C., "Rupture utérine à l'Hôpital régional de Thiès, Sénégal", *Journal de Gynécologie Obstétrique et Santé de la Reproduction*, 17(2), 28-32, 2016.
8. Fofie, C.O. and Baffoe, P., "A two-year review of uterine rupture in a regional hospital", *Ghana Medical Journal*, 44(3), 98-102, September 2010.
9. Rajaonarison, J., Fenomanana, M., Rakotondraisoa, J. and Randriambelomanana, J., "Rupture utérine pendant le travail: facteurs étiologiques et pronostic materno-fœtal", *Revue d'Anesthésie-Réanimation et de Médecine d'Urgence*, 6, 8-12, 2014.
10. Aboyaji, A.P., Ijaiya, M.A. and Yahaya, U.R., "Ruptured uterus: a study of 100 consecutive cases in Ilorin, Nigeria", *Journal of Obstetrics and Gynaecology Research*, 27(6), 341-348, December 2001.
11. Akotonga, M., Lankoandé, J., Gue, M.J. and Koné, B., "Ruptures utérines à la maternité du Centre hospitalier national Yalgado Ouédraogo: aspects épidémiologiques et cliniques", *Médecine d'Afrique Noire*, 45(8-9), 508-509, 1998.
12. Fane, S., "Épidémiologie de la rupture utérine: une étude cas-témoins à l'Hôpital de district de Bougouni, Sikasso, Mali", *Journal de Gynécologie Obstétrique et Santé de la Reproduction*, 22(1), 36-41, 2021.
13. World Health Organization, United Nations Population Fund and United Nations Children's Fund, *Managing complications in pregnancy and childbirth: a guide for midwives and doctors*, 2nd ed., World Health Organization, Geneva, 2017.
14. World Health Organization, *WHO recommendations: intrapartum care for a positive childbirth experience*, World Health Organization, Geneva, 2018.
15. World Health Organization, *WHO labour care guide: user's manual*, World Health Organization, Geneva, 2021.