

Uterine Rupture: Epidemiology and Maternal-Fetal Prognosis at the Kolondiéba Reference Health Center

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Abstract

Introduction: Uterine rupture, a solution to continuity of the wall of the pregnant uterus, is a medical-surgical emergency. Our aim was to assess the incidence and maternal-fetal prognosis of uterine rupture. **Materials Methods:** This was a retrospective descriptive cross-sectional study conducted at the Kolondiéba reference health center over 2 years (January 1, 2022 to December 31, 2023). All cases of uterine rupture received and treated at the reference health center were included. Data were collected from delivery registers, operative reports and obstetric records. **Results:** We recorded 40 cases of uterine rupture out of 2329 deliveries (1.7%). The average age was 31.25 years, with extremes of 18 and 44 years. Large multiparous women were the most common (40%). The evacuations received represented (85%) and (60%) had taken place between (1 - 3 prenatal consultations). Rupture occurred in 55% of cases in healthy uteri. The diagnosis was evoked preoperatively in 60% of cases. The average waiting time before surgery was 93.30 minutes. Rupture was complete in 72.5% of cases, and hysterorrhaphy was performed in 87.5%. We have recorded 15% maternal complications, dominated by pneumopathy (5%), one case of maternal death (2.5%) and 17.5% newborn survival rate. **Conclusion:** Uterine rupture is a frequent complication at the Kolondiéba health center, with a poor fetal prognosis. It requires rapid management.

Keywords

Uterine Rupture, Kolondiéba Health Center

1. Introduction

Uterine ruptures are complete or incomplete solutions of continuity of the wall of the gravid uterus, due to the existence of a fragility factor and/or excessive tension exerted on this wall [1].

It is a serious complication of obstetrics, with a poor prognosis. It occurs in every country in the world (developed or low-income), with varying degrees of prevalence. Its incidence is a barometer of the morbidity and mortality of a given population.

According to the WHO, in 2005 its incidence was 0.05% in the general population, and varied between 0.012% and 2.9% in healthcare establishments [2].

In France, a 2014 study found a frequency of 0.05% [3].

In Central Africa, in Bangui in 2023, a team recorded a prevalence of 0.6% in a maternity hospital in Bangui [4].

In the West African sub-region, particularly in Dakar (2020) [5] its frequency was 0.2% and in Bamako, at the commune V reference health center, it was 0.47% [6] (2020). Outside Bamako, a frequency of 3.7% was recorded in a study in Bougouni in 2019 [7].

It is a rare condition because of its poor prognosis, especially in the foetus. Fetal lethality was 52.40% in Butembo, Congo (2021) [8], 41.10% in Dakar (2020) [5] and 47.9% at the Csref in the V commune of Bamako (2020) [6].

In peripheral centers, poorly in personnel and equipment, receiving all kinds of obstetrical emergencies, the management of dreadful complications such as uterine rupture is a major challenge.

The Kolondiéba Reference Health Center is the main center for obstetric emergencies in the Kolondiéba health district. This district will have 312,962 inhabitants in 2023, spread across 23 functional health areas. It is the first reference center in the Malian health pyramid. It has a 10-bed maternity unit with three midwives and two obstetric nurses. A general surgeon, three general practitioners and an anesthesia-intensive care assistant provide emergency care. The center has no Pediatric or intensive care unit. With a view to improving the management of uterine rupture, we initiated this study, the objectives of which were to assess the frequency and prognosis of this pathology.

2. Materials and Methods

This was a retrospective, descriptive and cross-sectional study. It took place over two years (January 1, 2022-December 31, 2023).

All patients admitted to and managed at the reference health center for uterine rupture during pregnancy or postpartum were included in the study. Cases evacuated to hospital or managed in other centers were not included in the study.

Study site: the study took place at the Kolondiéba reference health center, capital of the Kolondiéba health district in the Sikasso region, with its 23 functional health areas with private structures. The district covers an area of 9200 km² with a population of 312,964 in 2023.

It is with minimal technical staff, but no intensive care unit, gynaecologist or paediatrician. Three CSCOM are served by tarmac roads, while the furthest centers 110 km away on a rural track. The rural tracks are in poor condition, especially during the rainy season. In the event of surgery, the generator is switched on to supply electricity. There are three ambulances, one of which can travel on rural tracks.

For obstetric emergencies, an ambulance may be available to pick up the patient, but if not, the patient is usually transported by motorbike or, on rare occasions, in her own car.

The variables studied were: frequency of rupture, age, parity, level of education, mode of admission, uterine condition, number of prenatal consultation, period of rupture, type of rupture, type of presentation, type of pregnancy, fetal heart sounds, risk factors, surgical procedures, transfusion, length of hospitalstay, complication, fetal and maternal lethality.

Data collection was based on obstetrical records, operative and hospital registers and partograms.

Data was entered in Excel and analyzed by SPSS.23.

We used the Fischer test to compare results with a significance level of $P \leq 0.05$.

Ethical considerations: confidentiality of the file was respected through the use of anonymity numbers.

3. Results

During our study period, we recorded 40 uterine ruptures out of 2329 deliveries, or 1.71%, with an average age of 31.25, a standard deviation of 6.31 and extremes of 18 and 44 years. The main socio-demographic aspects are shown in **Table 1**.

Table 1. Main socio-demographic aspects.

Age range	Number (n: 40)	Percentage
≤18 ans	1	2.50
19 - 35 ans	28	70.00
≥36 ans	11	27.50
Parity		
Primiparous	5	12.5
Pauciparous	6	15
Multipairs	13	32.5
Large multipairs	16	40
Education level		
Out of school	38	99
Educated (Primarylevel)	02	01

Mode of admission: 25 cases (62.5%) were evacuated from community health centers, 5 cases from rural maternity clinics (12.5%), 5 cases (12.5%) were evacu-

ated from medical and nursing practices and 2 cases of rupture occurred at the Kolondiéba reference health center (5%), 3 patients came directly from home (7.5%).

Contraception: 5 patients (12.50%) were using contraception.

Uterus' conditions: **Figure 1** shows the condition of the uterus on admission.

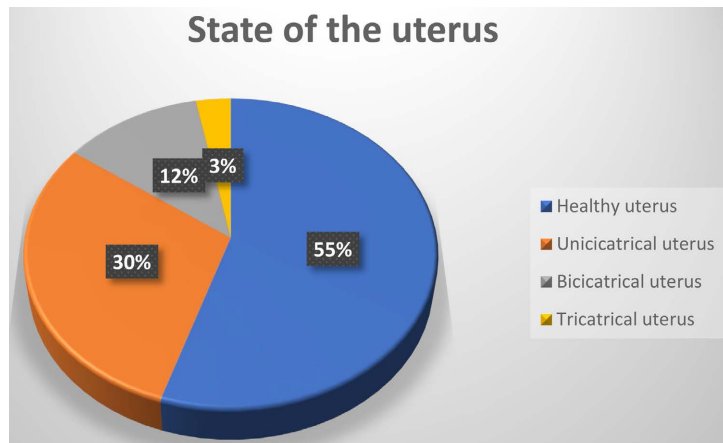


Figure 1. Uterine condition on admission.

Among the uni-cicatricuteri there were two cases of myomectomy.

Prenatal consultation: 24 patients (60%) had between 1 - 3 prenatal consultations, 9 patients (22.5%) had not any prenatal consultations, and 7 patients (17.50%) had 4 or more prenatal consultations.

Clinical aspects: In 37 patients (92.50%), the rupture occurred during labor.

In one patient (2.5%), it occurred prior to labour, and in two cases it was diagnosed immediately post-partum during uterine revision (5%).

Diagnosis: In 24 patients (60%), the diagnosis was made preoperatively, whereas in 16 (40%) it was made intraoperatively.

Hemorrhage was present in 25 patients (62.50%).

In 35 cases (87.5%), the pelvis was normal and borderline in 5 cases (12.50%). The presentation was apex in 24 cases (60%), seat in 3 cases (7.5%), transverse in 5 cases (12.5%) and in 7 cases we were unable to specify the type (17.5%).

Abdominal palpation revealed diffuse tenderness in 19 patients (47.5%).

Type of pregnancy: the pregnancy was singleton in 37 cases (92.5%) and twin in 3 cases (7.5%), including two cases of retention of the second twin. Fetal heart sounds were absent in 30 patients (75%).

The majority of patients under went surgery under general an aesthesia in 39 cases (97.5%), compared with one case of spinal an aesthesia (2.5%).

Type of rupture: Rupture was complete in 29 patients (72.5%) and incomplete in 11 (27.5%).

The incision was a median laparotomy in 23 patients (57.5%) and transverse subumbilical (Joel Cohen) in 17 (42.50%).

Risk factors: Rupture occurred after external maneuver versioning for trans-

verse presentation in one case.

One case of macrosomia was found.

We found no evidence of oxytocin or prostaglandin use, and no labor was induced.

Surgical procedures: The average waiting time before surgery was 98.30 minutes, with extremes of 8 minutes and 780 minutes.

We performed 35 cases of hysterography (87.5%), including one case associated with a bladder suture, 5 cases (12.5%) of subtotal and interannexal hysterectomy, including one case associated with a bladder suture. Other associated procedures included 6 cases (15%): right salpingectomy, hemostasis and closure of the mesorectum in 2 cases (5%), hemostasis and closure of the broad ligament in 1 case (2.5%) and suture of a bladder lesion in 2 cases (5%). We performed one repeat operation for omentum hematoma.

The mean duration of surgery was 73.27 mn with extremes of 34 mn and 130 mn.

Blood transfusion was performed in 16 patients (40%).

Seat of rupture: the rupture was at the body level in 8 cases (20%), the Body + lower segment 11 cases (27.5%) and the inner segment in 21 cases (52.5%).

Operator qualifiers: general practitioners treated 18 cases (45%), surgeons 15 cases (37.50%) and interns 7 cases (17.50%); Duration of hospitalization: the average length of hospitalization was 4.17 days with extremes of 3 days and 11 days.

Post-operative follow-up: follow-ups were simple in 34 patients (85%). We recorded 5 cases of maternal complications (15%). These complications are listed in **Table 2**.

Table 2. Post-operative course.

Evolution post-operatives	Workforce	Percentage
Evolution favorable	34	85
Pneumonia	2	5
Hemorrhagic shock	1	2.5
Vesico-vaginal fistulas (VVF)	1	2.5
The hematoma of the epiploon	1	2.5
Maternal death	1	2.5
Total	40	100

We performed a reoperation for an omentum haematoma.

One maternal death (2.5%) was due to hemorrhagic shock.

Fetal prognosis: We recorded 30 stillborn cases (75%) with 29 cases (72.50%) of fresh stillbirth and 1 case of macerated stillbirth (2.5%). There were 10 cases of survivors (25%), among them 3 died before or on the first day of life or 30% neo-

natal death. Overall survival rate was (7/40) or 17.5%.

4. Discussion

Frequency: We recorded 1.7% of uterine rupture in our center. This result was consistent with that obtained by the World Health Organization in 2015, which placed the prevalence of uterine rupture between (0.31% - 2.9%) in health facilities [2]. In our West African sub-region, some authors had lower rates [6] [9] [10] with 0.47%, 0.5% and 0.89% respectively and others higher rates [7] [11] with 3.7% and 2.90%.

The high frequency of ruptures in our structures could be due to the lack of qualified personnel in peripheral centers and the delay in evacuations.

Age of patients: The mean age in our study was 31.25 years. Several authors had found similar results such as [7] [9] [10].

Parity: In rural areas, women tend to have multiple maternity homes. In our study, the mean parity was 5.2 with extremes of 1 and 11. Fané S. [7] had found a comparable result with an average parity of 6 and extremes of 1 and 12. Multiparity was recognized as a determinant of uterine rupture in a study conducted in Mali and Senegal in 2018 by Rebekka *et al.* [12].

Mode of admission: In our context, the referral/evacuation system of the health system requires peripheral structures to refer to the reference health center parturients whose condition exceeds their capacity for care. This reference-evacuation has been recognized as an essential determinant of uterine rupture [12]. Thus in our study 87.5% of admissions were evacuations received. This rate was comparable to 72.1% of the Bougouni team [7] (2019) (p: 0.822).

Condition of the uterus: The rupture is multifactorial. Among the favoring factors, the uterine scar plays a large role. According to the WHO [2], in developed countries most uterine ruptures occur on scarred uterus.

In low-income countries, some authors have reported series with a predominance of healthy uterus. Fané S [7], Fousseini K, [11] reported rates of 79.1% and 85.7%, respectively.

In our study, this rate was (55%). The high rate of healthy uterus could be explained by the low rate of cesarean section in our context, which was 3% according to the 6th demographic and health survey in Mali (2018) [13].

Prenatal follow-up: The follow-up allows to detect anomalies in the course of pregnancy and the route of delivery. In our study, 9 parturients (22.5%) did not have a prenatal consultation. This frequency was comparable to that of S. Huyghe *et al.* [4] (30.8%) and Salifou K. *et al.* [14] (34.9%) with respectively (p: 0.30 and 0.12).

The remoteness of health center in rural areas hinders proper pregnancy monitoring.

Clinical signs: The uterine rupture is characterized by a clinical polymorphism, hence the need to evoke the diagnosis before fetal heart noise abnormalities, even minimal metrorrhagia, abdominal or suprapubic pain, hemodynamic insta-

bility or shock, macroscopic hematuria [15].

In our study, we found Metrorrhagia in (62.50%), the fetus was palpated under the skin (32.5%), diffuse abdominal defense (47.5%), non-appreciable presentation (17.5%), absent fetal heart sounds (75%) and hemodynamic shock (15%).

Favoring factors: We observed a dystocic pelvis in 12.5% of our patients. This rate was close to that of JC Rajaonarison *et al.* [16].

We obtained 21.12% of non-cephalic presentations, 12.5% of twin pregnancies, a result comparable to those of J C Rajaonarison [16] with rates of 25.8% and 25.80%, respectively. There was (2.5%) macrosomia in our sample while Traoré O *et al.* [6] had noted (21.42%) with a significant static difference (p: 0.0058). This difference could be explained by the geographic location of populations. We conducted our study in rural areas with poor nutritional conditions of pregnant women.

Type of rupture: Rupture was complete in 29 cases (72.5%). This predominance of complete ruptures was noted by authors [5]-[7] [9] [11]. In contrast, in a French series reported by M. Giuliano *et al.* [3] in 2014, incomplete ruptures predominated (51.92%).

This difference could be explained by the high number of uteri scarring in multipares which was 19% in 2010 in France [17].

Gestures performed: Preserving the uterus to maintain a chance of reproduction is a major concern in case of uterine rupture, but the challenge of saving the patient's life is a priority. We performed 35 hysterorraphies (87.5%). This predominance of uterine preservation was found in the majority of studies [9] [10] [19]. We achieved (15%) associated gestures. This result was close to that of the literature (5% - 10%) [15].

Post-operative follow-up: uterine rupture is a disease with multiple complications. We recorded 15% of maternal complications. This rate was statically lower than those of Fousseini K. [11] 40% and C. Vangeenderhuysen, *et al.* [18] 30% (p < 0.05).

Maternal mortality: uterine rupture is a common cause of maternal death. In our study, one case of maternal death (2.5%) was recorded. This rate was comparable to the 9% of Sadifou K. *et al.* [14] (p: 0.149) and lower than 19% of Philémon M. *et al.* [8] (p: 0.013).

Fetal mortality: The fetal prognosis of rupture is bleak.

We recorded a fetal mortality rate of 82.5%. Several authors found rates above 80% [6] [19] [20] with 91.83%, 82.6% and 86.2% respectively. Our lethality was lower than that of Charlotte *et al.* [21] (66%) but there was no statistically significant difference (p: 0.111).

5. Conclusion

Uterine rupture is a frequent complication at the Kolondiéba reference health center with a fetal mortality rate of 82.5%. Improved prognosis will require the detection and referral of patients at risk during pregnancy follow-up and prompt man-

agement of cases discharged to the reference health center.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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