

Uterine Rupture: Epidemiological, Clinical, Therapeutic, and Prognostic Aspects in N'Djamena Chadian and Chinese Friendship University Hospital Center

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Abstract

Introduction: Uterine rupture is any tear of continuity of the gravid uterus, extending over one or all parts of the uterus. Objective improve the management of uterine rupture at the Chad-China Friendship Hospital. **Patients and Method:** This was a descriptive study with retrospective data collection over a 2-year period from 01 January 2022 to 31 December 2023 in the Obstetrics and Gynaecology Department of the Chad-China Friendship Hospital. The study population consisted of patients admitted for uterine rupture. All uterine ruptures occurring during the study period were included in this study. Data were collected on a survey form completed from medical records, the delivery register, the operative report register, and the maternal and neonatal death register. The variables studied were epidemiological, clinical, therapeutic and prognostic. Data were entered using Microsoft Word and Excel and analysed using Sphinx software. **Results:** A total of 39 cases of uterine rupture were recorded out of 14,023 deliveries, representing a frequency of 0.27%. The profile was that of young patients (51.2%) with an average age of 28.08 ± 6.1 years, ranging from 18 to 43 years, multiparous (35.8%), self-employed (66.6%), living mainly in urban areas (82.5%), uneducated (89.7%), all married (100%) and housewives (94.9%). The reasons for admission were dominated by lumbopelvic pain associated with bleeding (66.6%), which occurred spontaneously in the majority of cases in full-term pregnancies (92.3%) not followed up (74.4%), the aetiology of which was dominated by prolonged la-

bour associated with excessive use of uterotonics (61.5%). Conservative surgery was performed in 89.7% of cases. We recorded 94.9% perinatal deaths and 5.1% of maternal deaths. **Conclusion:** Uterine rupture is a surgical emergency whose evolution and maternal-fetal prognosis depend on the speed with which it is managed.

Keywords

Uterine Rupture, Chad-China Friendship Hospital, Ndjamen

1. Introduction

Uterine rupture (UR) is a partial or complete tear of a pregnant uterus [1]. It most often occurs in the lower segment, which is the preferred site for uterine ruptures [1]. Classically, there are complete and exclusively incomplete uterine ruptures, depending on whether the uterine cavity directly communicates with the large peritoneal cavity or is separated from it by the uterine peritoneum. In developed countries, it has become rare and has almost disappeared thanks to clinical and electronic monitoring of labor and prophylactic measures during pregnancy [1]. In France, its frequency is 0.076%, 0.0059% in the USA, and 0.015% in Singapore [1], proving that this condition does not have to be inevitable in our countries. In Africa, and particularly in sub-Saharan Africa, uterine rupture remains one of the obstetrician's main concerns [2]. It remains frequent, around 0.66% in Senegal, 0.65% in Côte d'Ivoire, 0.44% in Benin, 0.22% in Morocco, and reveals severe forms, affecting both maternal and fetal prognosis [2].

In Chad, uterine rupture remains one of the main causes of significant maternal morbidity and mortality. Studies conducted in N'Djamena Mother and Child University Hospital (NMCUH) in 2019 and 2024 reveal respective frequencies of 0.8% and 1.17% [3] [4].

That is why we initiated this study at the Chad-China Friendship Hospital, with the objective to improve the management of uterine rupture

2. Patients and Method

This was a descriptive study with retrospective data collection over a two (2) year period from January 1, 2022, to December 31, 2023. The records of every pregnant woman admitted for uterine rupture in the gynecology-obstetrics department of N'djamena Chadian and Chinese Friendship University Hospital Center. This study included all cases of uterine rupture that occurred during the study period in the department. Cases of cervical tears that did not extend to the uterus, or those resulting from an abortion procedure, and other third-trimester hemorrhages (abruptio placenta and placenta previa) were not included in this study. We recruited cases meeting the inclusion criteria from the gynecological and obstetric emergency department, the delivery room and the operating theatre. Data were collected on a survey form completed on the basis of medical records, the delivery

register, the surgical report register and the maternal and neonatal death register.

The data were entered using Microsoft Word and Excel and analyzed using Sphinx software.

3. Results

3.1. Frequency

During this period, we recorded a total of 39 cases of uterine rupture out of 14,023 deliveries, representing a frequency of 0.27%.

3.2. Age

Table 1. Distribution of patients according to age.

Age (year)	n	%
18 - 26	20	51.2
27 - 35	14	35.8
36 - 43	5	12.8
Total	39	100

The average age of the parturient was 28.08 ± 6.1 years, with extremes of 18 years and 43 years, with the age group of 18 to 26 years being the most represented (51.2%) (**Table 1**).

3.3. Antecedents

Patients living in urban areas accounted for 82.5%. All the parturients were married (100%). The majority of the parturients were uneducated, representing 89.7%. Housewives were the most represented group, accounting for 94.9%. Most of the parturients had come on their own (82.1%).

Most laboring women had no known medical history (71.7%). Multigravida patients accounted for 38.4% of cases. More than one-third of laboring women were multiparous (35.8%). Patients with a scarred uniparous uterus represented 20.5%. Most uterine ruptures occurred in term pregnancies, accounting for 92.3%.

3.4. Reason for Consultation

Table 2. Distribution according to the reasons for consultation.

Consultation reason	n	%
Unknown	5	12.8
Cephalo-pelvic dysproportion	1	2.6
bleeding	26	66.7
Abdominal pain	5	12.8
Postpartum hemorrhage	2	5.2

Bleeding was mainly the reason for consultation (66.7%) (**Table 2**).

3.5. Prenatal Cares

Three-quarters of laboring women had not attended any prenatal consultations (74.4%). Unmonitored pregnancies represented 74.4%.

The patients who had never received vaccinations (tetanus vaccine) during pregnancy were the majority, accounting for 89.7% of cases. Three-quarters of the women giving birth had not undergone any biological tests, that is, 74.4%.

Two-thirds of the women giving birth had never received prophylactic treatment (66.6%).

3.6. Cause of Rupture

Table 3. Distribution of patients according to the causes of uterine rupture.

Etiology	n	%
Feto-pelvic disproportion	1	2.6
Abnormal presentations	8	20.5
Macrosomia	4	10.2
Inadequate use of oxytocin	2	5.1
Dynamic dystocia + abusive use of uterotonics + prolonged labor	24	61.5
Total	39	100

Dynamic dystocia with prolonged labor associated with the abusive use of uterotonics was the main cause of uterine ruptures (61.5%) (**Table 3**).

3.7. Type of Uterine Rupture

The majority of uterine ruptures were located at the segmental-corporeal level (61.5%). Most uterine ruptures had no associated injuries (92.3%).

3.8. Surgical Procedure

Table 4. Distribution of patients according to the type of surgical procedure.

Surgical procedure	n	%
Subtotal hysterectomy	2	5.1
Total hysterectomy	2	5.1
Hysterorrhaphy	35	89.7
Total	39	100

Hysterorrhaphy was the surgical treatment (89.7%) (**Table 4**).

3.9. Evolution

Maternal complications were represented by hemorrhagic shock (5.1%). The

length of hospital stay for most of our patients was 5 days or less, accounting for 74.3% of cases. Most newborns had a weight between 2500 g and 3999 g (69.3%). The maternal-fetal prognosis was characterized by neonatal mortality of 94.9% and maternal mortality of 5.1%.

4. Discussion

Out of a total of 14,023 deliveries over 24 months, we recorded 39 cases of uterine rupture, representing a frequency of 0.27%. The observed frequency of uterine rupture in our study is significantly lower than that reported by other authors. Indeed, M. Mirielle [4] reported a rate of 1.5% in Chad, Fané S. [5] of 3.7%, of 1.04%, Diakité Y. [6] of 0.37% in Mali, and Gueye [7] of 0.58% in Senegal. These variations illustrate that the frequency of uterine rupture can vary from one country to another, or even within the same country or hospital department, depending on the period studied and the profile of the recruited patients. The low rate observed in our study could be explained by the presence of several other hospital facilities in the city, notably the NMCUH, where the most severe complications requiring intensive care are referred.

The average age of the mothers was 28.08 ± 6.1 years, with extremes of 18 and 43 years. All age groups of the reproductive period were represented, with the age group of 20 to 35 being the most frequent. This observation was also reported by some authors, M. Mirielle [4] in 2024 in Chad and Fane S [8] in Mali, who noted an average age of 27.5 years. This age group corresponds to the period of intense reproductive activity. We observed that almost all patients who experienced uterine rupture lived in urban areas, with 32 cases (82%), compared to only 3 patients (7.5%) from rural areas, while the geographical origin of 4 patients (10.3%) could not be determined. This rate is lower than that reported by Mirielle M. [4], where 67% of uterine rupture cases came from urban areas.

This low proportion of cases coming from rural areas in our series could be explained by the presence, in the same locality, of the NMCUH, a facility specialized in gynecology and obstetrics, with a full intensive care unit, to which patients presenting obstetric complications are often directly referred. The geographical proximity of this facility to our hospital could thus influence the distribution of cases. Regarding marital status, in this series, all patients were married (100%) and living as a couple, and 94.9% were housewives. This is similar to the case reported by Fané S [5], with 100% married and 97.7% housewives. This could be explained by the fact that the majority of the Chadian population is religious and respects the tradition according to which being in a couple is synonymous with honor. Regarding the level of education, 89.7% of our patients were uneducated. This rate is close to that obtained by Fané S [5], which is 95.4%. An uneducated woman seeks professional care less than a literate one, a very notable example in our country. This contributes to the low attendance at prenatal consultation services and is a negative factor favoring the occurrence of uterine rupture.

In this study, 17.1% of the patients were referred, while 82.9% came on their

own, among whom 66.6% of the uterine ruptures occurred during attempts at home delivery, figures close to those of F Konaré [8] in Mali, who found 62%, and Ansia B [9] in Bangladesh, who found 57.7%. This could be explained by the fact that the majority of deliveries take place at home, and the women resort to healthcare facilities only in case of complications. In our series, multiparity and grand multiparity accounted for 61.4% of uterine rupture cases. This result aligns with the data reported by Bako M. [10] and Diakité Y. [6], who consider multiparity as a major contributing factor due to the progressive weakening of the uterine wall associated with repeated childbirths. Furthermore, uterine rupture on a scarred uterus was observed in 23.1% of cases. This rate is comparable to that reported by Gueye M. [7] in Senegal (20.1%) but remains significantly lower than that observed by Bako M. [10], who reported a rate of 89%. Conversely, it is higher than those described by Gabkika B. [3] and Mirielle M. [6] in Chad. These variations between studies can be explained by differences in the quality of prenatal care, obstetric practices, management of previous cesarean sections, and access to emergency obstetric care in the studied contexts.

Surgical history, especially cesarean sections, constitutes a predisposing factor for uterine rupture and requires proper counseling to prevent risks in future deliveries, particularly with respect to respecting the interpregnancy interval and prenatal consultations.

Regarding pregnancy follow-up, 74.4% of patients had not attended any prenatal consultation (PNC), a rate significantly higher than that reported by Koutora B [11] in Togo and Astatikie [12] in Ethiopia, which were 53.1% and 40%, respectively. Among those who did attend, the majority had only one or two consultations during the pregnancy. Only two patients were followed by a doctor, while the majority received care from personnel assumed to be unqualified. It is particularly concerning to note that some patients with a history of cesarean section had attended no prenatal consultations, or only one, during their last pregnancy.

The total absence of prenatal consultations (“0 ANC”) is a major risk factor in the occurrence of uterine rupture. Indeed, prenatal consultations not only allow the detection of high-risk pregnancies, particularly among women with a scarred uterus, but also enable planning of appropriate management, including delivery in a medicalized setting. Their absence therefore, exposes women to inadequate care. Our study revealed that, in the majority of cases—61.5% prolonged labor associated with the abusive use of oxytocin, dystocic presentations accounted for 20.5%, uterine distension 10.2%, and abusive oxytocin use 5.1%. A similar trend was also observed in Bangui, where uncontrolled use of uterotonics was implicated in 64.5% of uterine rupture cases, highlighting a shared issue in several sub-Saharan African countries [13].

Uterine rupture can be either spontaneous or induced. Spontaneous forms occur most often during labor, in cases of maternal dystocia (narrow pelvis) or fetal dystocia (abnormal presentations). Induced ruptures, on the other hand, are often related to inappropriate use of uterotonics, traumatic obstetric maneuvers, or insufficient monitoring of labor.

Furthermore, the rupture was complete in 74.4% of cases, compared to 25.6% of incomplete ruptures. These results are comparable to those of M. Mirielle [6], who reported 78.6% of complete ruptures, and Vandenberghe G [14], who found a rate of 74% of complete ruptures, compared to 37.5% and 7% of incomplete forms. These data confirm the predominance of complete ruptures, which are often more severe and associated with high maternal-fetal morbidity. In our study, the site of uterine rupture was segmentocorporal in 61.5% of cases, segmental in 17.9%, and corporal in 20.5%. These results differ somewhat from those reported by other authors. Indeed, Mirielle [4], who found segmental rupture rates of 77%. These differences could be linked to the diversity of previous surgical techniques, care contexts, and the mode of previous delivery. Furthermore, lesions associated with uterine rupture were observed in 7.7% of cases in our series, a rate lower than that reported by M. Bako [10] in Mali, which was 13%. These lesions can worsen maternal prognosis and often require additional surgical interventions. Hysteroscopy was the surgical treatment of choice in this series (89.7%). This rate is close to those reported by I. Baldé [15] in Guinea, T Nguefack *et al.* [16] in Cameroon, who reported 88.1% and 90.2%, respectively. Conversely, it is higher than that of other African series, notably M Mirielle [4] in Chad who found 76%, and P Matumo [17] in the DRC who noted 61.5%, 52.4%, and 40% hysterorhaphy respectively. This discrepancy in rates could be explained by the fact that women arrive late at the stage of complications where conservative treatment is no longer possible. We performed a total hysterectomy in 5.1% and a subtotal hysterectomy in also 5.1% of cases. Our result is lower than that of Gueyé [7] in Senegal, who reported 29.7% cases of hysterectomy. Several authors emphasize that the choice of technique depends on several parameters, namely: the type and duration of the lesions, the age and parity of the patient, the desire for future pregnancy, socio-economic and sociocultural conditions, the technical resources, and above all the experience of the obstetric team [4]. The rapidity of diagnosis and management improves the maternal-fetal prognosis. In this series, we recorded 5.1% maternal deaths. This rate is lower than that reported by some authors, for example: M Mirielle [6], Gabkika B [3] in Chad, Gueye M [7] in Senegal; Astatikie [12] in Ethiopia and Jombo [18] in Nigeria, who found respectively 9%; 7.3%; 16.2%; 7.3% and 6.8%. This result could be explained by the fact that CHUME is nearby and takes care of patients requiring resuscitation, due to the lack of a resuscitation service in our facility. The foetal prognosis was compromised in the majority of cases, especially in our context where patients arrive late at the hospital, resulting in high perinatal mortality. In this study, we noted 94.8% perinatal deaths, a result higher than that obtained by some authors such as M Mirielle [4] and Gabkika [3] in Chad, Jombo [18] in Nigeria and Fouedjio [19] in Cameroon, who found 70% and 85.3%; 88.1% and 80%, respectively.

5. Conclusion

Uterine rupture remains a serious and formidable obstetric condition due to its severity. In our series, it mainly affects multiparous women with no education

who have not received adequate prenatal care. Analysis of the data showed that most cases occurred in an intact uterus, with a predominance of segmental-corporal locations and complete forms. Main identified etiologies include dynamic dystocia and the abusive use of uterotonics associated with prolonged labor and the excessive use of oxytocin. These findings highlight the complexity of this pathology, often diagnosed late, in the context of non-medicalized or poorly supervised childbirth. Despite a relatively low rate of associated injuries, uterine rupture remains a major obstetric emergency, the consequences of which can be dramatic for both the mother and the fetus. This study thus highlights the persistence of vulnerability factors related to access to care, education, and the obstetric context, which favor the occurrence of this complication in our hospital facilities.

Conflicts of Interest

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

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