

Uterine Rupture at Fousseyni Daou Hospital in Kayes over a Period of 10 Years

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Abstract

Introduction: Uterine rupture is a solution of complete or incomplete non-surgical continuity of the wall of the gravid uterus. It is a dreaded obstetric disease with a poor maternal-fetal prognosis in terms of morbidity and mortality. **Objective:** To study the epidemio-clinical, therapeutic and prognostic aspects of uterine rupture at the Fousseyni Daou Hospital in Kayes. **Materials and Methods:** This was a cross-sectional, descriptive and analytical study with retrospective collection, from 1 January 2012 to 31 December 2021. We included in our study all cases of uterine rupture diagnosed and treated at the Fousseyni Daou Hospital in Kayes during the study period. **Results:** The frequency of uterine rupture was 0.3%. The mean age of parturients was 29 years with extremes of 15 and 45 years. Parturients were evacuated in 78.74% of cases. Prolonged work was the leading reason for evacuation with a frequency of 14.2%. Uterine scarring was the top risk factor with 27.6%. Complete ruptures accounted for 81% and the breech was segmental in 69.8% of cases. Hysterorrhaphy was performed in 75.6% of parturients. The outcome was favourable in 59.52% of cases and anaemia was the most frequent postoperative complication with 34.1%. The maternal death rate was 7.9% and the fetal death rate was 74.6%. **Conclusion:** Uterine rupture is an obstetric-surgical emergency whose prognosis depends on the speed of diagnosis and management.

Keywords: Rupture, Uterin, Hospital, Kayes.

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INTRODUCTION

Uterine rupture is a solution of complete or incomplete non-surgical continuity of the wall of the

gravid uterus. Indeed, it is a dreaded obstetric disease with a poor maternal-fetal prognosis in terms of morbidity and mortality [1]. The first written work on this pathology was written by Guillemeau at the

beginning of the seventeenth century. In his book entitled "On Pregnancy and Childbirth", he shows the seriousness of the prognosis that it causes in pregnant women by tearing the uterine muscle [2]. Uterine rupture is exceptional in developed countries: thus in France the frequency of uterine rupture is 0.05% in the study of Guiliano *et al.*, [3], in Spain Perez-Adan *et al.*, [4] found a frequency of 0.078%, in the USA its frequency is 0.006% [5]. The first African studies were done in Algeria, Morocco and Tunisia. In Africa, its frequency is relatively high due to risk factors such as low socio-economic status, insufficient prenatal care, geographical distance, high multiparity and lack of health infrastructure equipped with equipment and qualified personnel [6]. Diallo *et al.*, [7] reported a 0.36% frequency of uterine rupture at the University Clinic of Gynecology and Obstetrics of the Donka National Hospital, University Hospital of Conakry, Guinea. In Senegal, Gueye L. [8] had found a frequency of 0.58% uterine rupture in 2016. In Mali, this subject has been the subject of several previous studies. Together with the haemorrhage it causes, it is 30% of the leading causes of death in developing countries [12]. A qualitative study of the causes of maternal mortality in Bamako showed that uterine rupture occupies second place with a relative frequency of 20% of deaths [1, 2]. Uterine scarring is the main risk factor for uterine rupture. Several other factors are implicated: dystocic presentations, inductions of labour, advanced maternal age, multiparity, fetal macrosomia, multiple pregnancies, congenital uterine anomalies, and instrumental delivery [13]. In Kayes, only one study had been conducted on uterine rupture in 2007 [9], the problem could be even more worrying. Thus, we initiated this work at the Fousseyni DAOU Hospital in Kayes, which is a second referral hospital providing care for all obstetric emergencies in the region, whose aim was to study the epidemio-clinical therapeutic aspects and the prognosis of uterine rupture in the Gynecology-Obstetrics Department of the Fousseyni Daou Hospital in Kayes.

MATERIALS AND METHODS

This was a cross-sectional, descriptive and analytical study, with retrospective data collection, over a period of 10 years, from 01 January 2012 to 31 December 2021. The study focused on all parturients admitted to labour and in the immediate postpartum period in the Gynaecology - Obstetrics department of the Fousseyni DAOU hospital in Kayes during the study period. The sample consisted of all cases of uterine rupture diagnosed before, during labour or postpartum during the study period. We included in this study, all cases of uterine rupture diagnosed and managed in the department during the study period. We did not include in our study:

- Cases of uterine rupture diagnosed outside the study period;
- Missing records of uterine rupture;
- Tears and decay limited to the cervix.

Data were collected on the basis of a survey form drawn up from the delivery register, the register of parturients, the reference/evacuation register, the operative report register, the maternal death register, the anaesthesia register, the u Emergency Obstetric and Neonatal Care Register, Transfusion Registry and Hospital Register.

Data entry was performed on Microsoft Office World 2013 software. The processing and statistical analysis of the statistical data was carried out using SPSS 20.0 software. Fischer's exact test and Person's Chi-2 test were used to compare proportions with a significant $p < 0.05$. Informed consent and confidentiality were respected for each parturient.

RESULTS

During our study period, we collected 127 cases of uterine rupture out of a total of 37701 deliveries, i.e. a frequency of 0.3%.

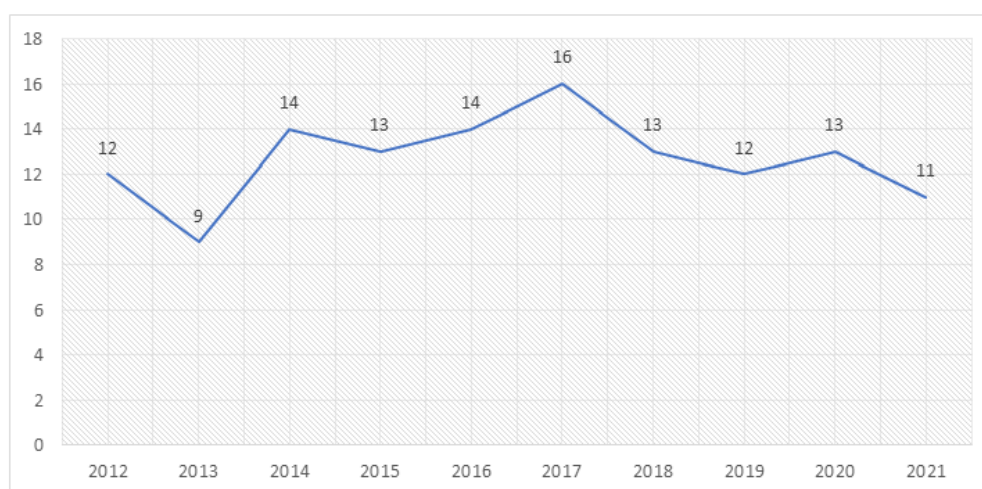


Figure 1: Annual Prevalence of Uterine Ruptures

The 30-34 age group accounted for 47.2%, the 20-29 age group, 19 years or less and 35 years or less accounted for 32.3%, 7.9% and 12.6% respectively. The mean age was 28.97 years, with extremes of 15 and 41 years. In our series, 96.9% of the parturients were not in school, 1.6% of the parturients had a primary and secondary level respectively. Housewives accounted for 96.1 per cent, shopkeepers 2.4 per cent and civil servants 1.6 per cent. Married women accounted for 85%, single women 9%, divorced women 4%, widows 2%. In our study, 63% of parturients had been evacuated by Community Health Centers, 25% by Referral Health

Centers, 4% by medical clinics and 8% by doctors' offices. Parturients were evacuated by ambulance in 35.4% of cases, by personal vehicle in 30.7% of cases, by public transport in 20.8% of cases and by other means of transport in 13.4% of cases. In 35.4% of cases, 57.5% of parturients had not had an antenatal consultation and 7.1% had made at least 4 antenatal consultations. Among the parturients who had undergone antenatal consultations, the author was a gynecologist-Obstetrician in 9.8% of cases, a midwife in 19.5% of cases, a general practitioner in 14.6% of cases, an obstetrician nurse in 34.1% of cases and a matron in 21.9% of cases.

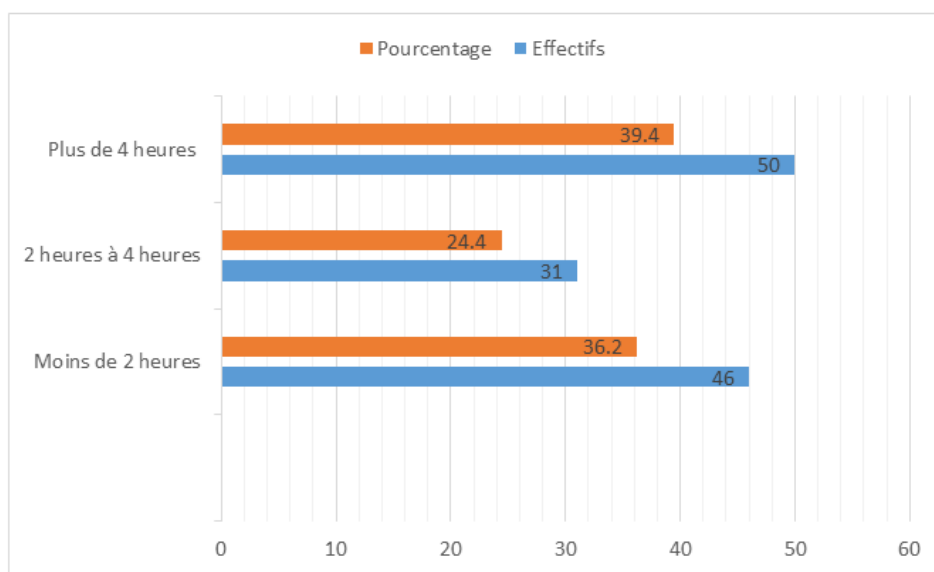


Figure 2: Distribution of parturients according to travel time

The average travel time was 2 hours 39 minutes with extremes of 15 minutes and 5 hours 30 minutes, standard deviation: 1 hour 47 minutes.

Table I: Distribution of Parturients by Gender Equality

Parity	Actual	%
Nulliparous	04	3,1
Primiparus	18	14,2
Pauci paré	14	11
Multiparous	51	40,2
Large multiparous	40	31,5
Total	127	100

The average parity was 6.5 with extremes from 0 to 13. Multiparous were the most represented with a frequency of 40.2%.

Table II: Distribution of parturients by surgical history

Surgical ATCDs	Actual	%
Uterine rupture	01	0,8
Myomectomy	01	0,8
Kystectomy	01	0,8
Salpingectomy	02	1,6
Appendectomy	02	1,6
Caesarean section	33	26
No ATCD	87	68,5
Total	127	100

Parturients had a history of a unicatactial uterus in 48% of cases, bicatrical in 26% of cases, tricatrical in 20% of cases, and quadricatrical in 6%

of cases. Parturients came of their own accord in 21.2.6% of cases and were evacuated in 78.74% of cases.

Table III: Distribution of Cases of Uterine Rupture by Reason for Admission

Reasons for admission	Actual	%
Labor	26	20,5
Extended work	18	14,2
Bleeding during pregnancy	16	12,6
Acute fetal distress	09	07,1
Vicious presentation	09	07,1
Scarred uterus	07	05,5
Other	06	04,7
Terminated pregnancy	06	04,7
Lack of expulsive effort	06	04,7
Postpartum hemorrhage	06	04,7
Anaemia	03	02,4
Uterine rupture	03	02,4
Placenta previa	03	02,4
Preeclampsia/eclampsia	03	02,4
DFP	03	02,4
I I G short	02	01,6
HRP	01	0,8
Total	127	100

Other: Two (2) parturients admitted for road traffic accident, one (1) for assault and battery, and three (3) diagnoses made in the operative program for prophylactic caesarean section.

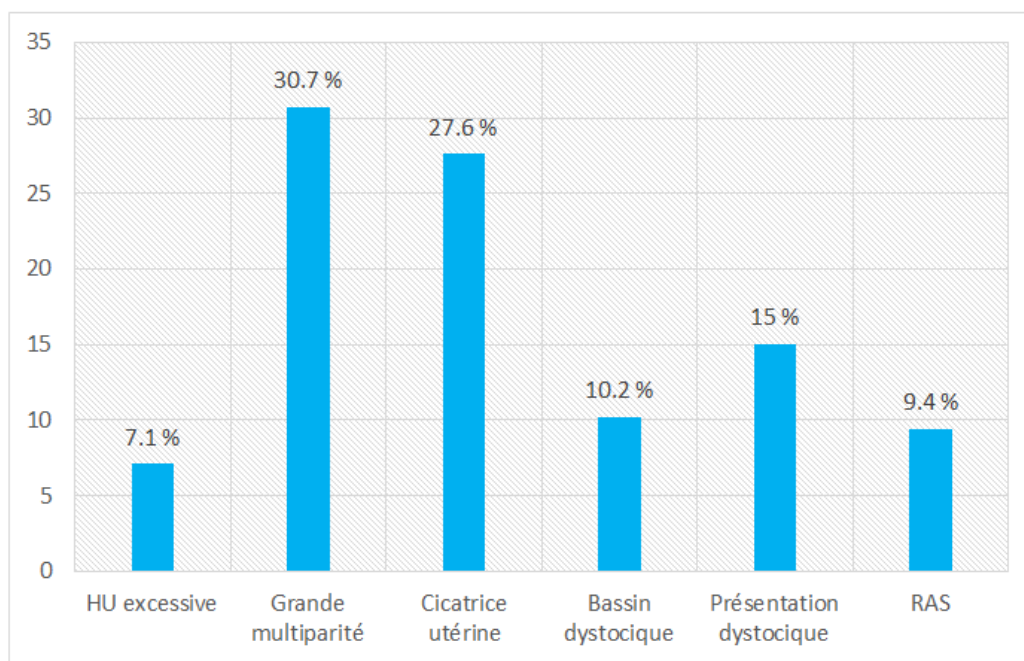


Figure 3: Distribution of parturients by risk factor

In our series, 81.7% of parturients had given birth vaginally (laparotomy or caesarean section) compared to 18.3% vaginally. Newborns weighed less than 2500g in 10% of cases, between 2500 and 3999g in 72% of cases, greater than or equal to 4000g in 12% of cases and unknown in 6% of cases. The average weight

was 3075g grams with extremes of 950g and 5200g. In our study, 70.6% of parturients had given birth in hospital, 9.5% in a C between Sante, 7.9% in a C between community health, 5.6% in a medical C, 2.4% in a medical C and 4% at home.

Table IV: Distribution of parturients according to the circumstance of uterine rupture

Circumstances of occurrence of RU	Actual	%
Spontaneous	44	34,6
Use of oxytocin	34	26,8
Extended work	21	16,5
Uterine expression	10	7,9
Cupping/forceps delivery	08	6,3
MVI	07	5,5
Other	03	2,4
Total	127	100

Other: Two (2) cases of road traffic accident and one (1) case of assault and intentional injury.

The diagnosis of uterine rupture was made perpartum in 84.3% of cases, postpartum in 11% of cases and preparatory in 4.7% of cases.

Table V: Distribution of parturients according to the nature and location of uterine rupture

	Number of employees (n=126)	%
Nature of the breach		
Complete Breakout	102	81,0
Subserous rupture	24	19,0
Fracture site		
Segmental	88	69,8
Corporate	07	5,5
Segmento-corporeal	31	24,6

In our study, we observed 8.7% bladder lesions. We performed a simple hysterorrhaphy in 75.6% of cases, a hysterorrhaphy with tubal resection ligation in 7.9% of cases and a subtotal hysterectomy in 13.4% of cases. General anaesthesia was used in 90.5% of cases and loco-regional anaesthesia in 9.5%. Parturients received macromolecules in 74.2% of cases, transfusion

in 71.6% of cases, oxygen in 33.9% of cases, catecholamines in 29.1% of cases and 25.9% were not resuscitated. Postoperatively, 28.3% of uterine rupture cases received thromboprophylaxis, 100% received antibiotic prophylaxis, 100% received analgesics and 100% also received iron. The evolution was favorable in 92.1% of cases and the case fatality rate was 7.9%.

Table VI: Distribution of parturients according to postoperative outcomes

Post-operative care	Actual	%
Peritonitis	02	01,6
Vesicovaginal fistula	02	01,6
Parietal infection	04	03,2
Anaemia	34	27
Simple	75	59,5
Death	09	07,1
Total	126	100

Table VII: Distribution of patients by time of onset and cause of death

	Number of employees (n=10)	%
Time of death		
Death confirmed on arrival	01	10
Operating theatre	02	20
Inpatient ward	07	70
Causes of Death		
Hemorrhagic shock	06	60
Septicaemia	02	20
Peritonitis	02	20

We observed 25.4% of live newborns, 65.1% of fresh stillbirths and 9.5% of macerated stillbirths.

Table VIII: Distribution of parturients according to mode of admission and nature of uterine rupture

Method of admission	Nature of the breach		Total
	Complete Under Sereuse		
Coming of Itself	18 (17,6%)	08 (33,3%)	26
Evacuated	84 (82,4%)	16 (66,7%)	100
Total	102 (100%)	24 (100%)	126

Person's chi-square: 0.9 so no statistical relationship between mode of admission and uterine status.

Table IX: Distribution of patients according to the number of uterine scars and the type of rupture

Fracture Type	Number of scars					Total
	0	1	2	3	4	
Complete	76	12	06	06	02	102
Sub-serous	15	05	03	01	00	24
Total	91	17	09	07	02	126

Fischer test ($p = 0.009$): there is a statistical relationship between the number of uterine scars and the type of uterine rupture.

Table X: Distribution of parturients between the type of rupture and the postoperative period

Fracture Type	Post-operative care						Total
	Infection	Anemia	Peritonitis	Fistula	Death	None	
Complete	03	29	02	02	07	59	102
Sub-serous	01	04	00	00	02	16	24
Total	04	34	02	02	09	75	126

Fischer test ($p = 0.003$): there is a statistical relationship between complications and the type of uterine rupture.

Table XI: Distribution of patients between fetal prognosis and nature of uterine rupture

Condition of the newborn	Nature of the breach		Total
	Complete Under Sereuse		
Alive	20 (19,6%)	12 (50%)	32
Stillborn	82 (80,4%)	12 (50%)	94
Total	102 (100%)	24 (100)	126

Person's chi-square: 0.04, fetal prognosis and type of rupture are statistically related.

DISCUSSION

During our study, we collected 127 cases of uterine rupture out of a total of 37701 deliveries, i.e. a frequency of 0.3%. Camara, S., [14], Diakit , Y., [15], and Val re, M. K., *et al.*, [15] reported a frequency of 1.1%, 0.4% and 2.4%, respectively. Koita R. [10], Fan  K. [17], Diakit  I. [2], and Sem  K. [18] reported a higher frequency of 0.18%, 0.016%, 0.03% and 0.13% of uterine rupture, respectively. Gueye L. [8] in Senegal in 2016, Kabibo S. [18] in Benin in 2015, and Amate P. [13] in Algeria in 2014 reported a frequency of 0.58% respectively; 0,70%; and 0.128%. The frequency of this pathology varies from one country to another and within the same country from one health facility to another. Our high frequency could be explained by late evacuations, insufficient health coverage, lack of trained personnel and poor prenatal care. Uterine rupture can affect all age groups in women in genital activity. The mean age of our patients was 28.97 years with extremes of 15 and 41 years. . The 30 to 34 age group was the most represented with a frequency of 47.2%.

Many authors such as Berth  F K. [19], Koita R. [10], Fan  K. [17] and Camara S. [14] reported the same age range. This age range corresponds to the period

when reproductive activity is intense. In our study, 96.9% of parturients were out of school, 95% were married, and 96.1% were housewives. In our series, 64.6% of parturients had at least one antenatal consultation (PNC) compared to 70% in Bako M M. [11], 64.3% in Camara S. [14], 77% in Diakit  Y. [15] and 36.1% in Koita R. [10].

On the other hand, 35.4% had not carried out any NPC, compared to 30%; 35,7% ; 23% and 24.2% respectively at Bako M M. [11], Camara S.[1 4] Diakit  Y. [15] and Koita R. [10]. 19.5% were followed by midwives compared to 48%, 44%, 56% and 55% respectively at Bako M M. [11], Camara S. [14], Diakit  Y. [15] and Koita R. [10]. In our series, 79.7% of parturients had been evacuated and 21.3% had come on their own. Traor  M. [21] reported that 92.6% of the parturients evacuated, Bako M M. [11] reported that 89% of the parturients were evacuated and 11% came of their own accord, and Diakit  Y. [15] reported that 64.1% of the parturients were evacuated evacuated and 33.8 had come on their own. During our study, 44.9% of parturients had been evacuated by ambulance and 55.1% by public transport. Bako M M [11] had reported that 82% of parturients evacuated by ambulance and 9% by public transport, Koita R [10] found 54% parturients

evacuated by ambulance and 7% by public transport. Fané K [17] found that 90% of parturients evacuated by ambulance and 8% by public transport. The nature of uterine rupture and the mode of admission of patients are not statistically proven (Person's Chi-square: 0.9). The mean parity was 6.5 with extremes of 1 and 12. Multiparous accounted for 40.2%. Our result is similar to those of Bako M M. [11], Camara S. [14], Diakité Y. [15], Koita R. [10], this could be explained by the fact that the frequency of uterine ruptures increases with parity due to histological changes in the uterine muscle. In our series, 27.6% of parturients had a scarred uterus. This frequency is lower than that of Bako M M. [11]; Koita R. [10] and Diakité Y. [15] reported 37.7%, 97% and 38.8% respectively. We found a statistical association between the nature of the rupture and the number of uterine scars, ($P = 0.009$). Parity, uterine scarring, dystocic pelvis, dystocic presentations, and oxytocin misuse were factors contributing to the occurrence of uterine rupture. In our series, 14.2% of parturients were evacuated for prolonged labour, 12.6% for bleeding during pregnancy, 7.1% for acute fetal distress and 2.4% for uterine rupture. Bako M. [11] had reported that 33.8% of parturients were evacuated for uterine rupture, 9.4% evacuated for retroplacental hematoma, and 7.2% evacuated for placenta previa. FANE K. [17] reported that 10% of parturients were evacuated for metrorrhagia, 11% for stationary dilation and 8% for uterine rupture. In our study, 50% of the cases of labour took place in a community health centre, in 19.8% in a referral health centre and in 8.7% of cases at home. Bako M M. [11] had found that delivery labour took place in 78% of cases in a community health center, and 11% at home, Camara S. [14] had found that labor took place in 70% of cases in a health center and 18% at home and Diakité Y. [15] had found that labor took place in 70% of cases in a health center and 18% at home and Diakité Y. [15] had found that labor took place in 70% of cases in a health center and 18% at home and Diakité Y. [15] had found that that 78.19 per cent of labour took place in a health centre and 7.5 per cent at home. The duration of labour was ≥ 12 hours in 41.3% of parturients. Bako M M. [11], Koita R. [10] and Diakité Y. [15] reported respectively 44%, 72% and 67% of working time ≥ 12 hours. The use of oxytocin was the cause of uterine rupture in 26.77% of cases. Berthé F K. [20], Camara S [14] and Diakité Y [15] found 51.7%, 35.7% and 23.7% oxytocin use, respectively. Dystocic presentations such as shoulder and breech presentations were the most common causes of uterine ruptures with 8.7% and 11.2% respectively. Diakité Y. [15] in Mali, and Diouf A. [22] in Senegal found 48% and 8.5% respectively. In our study, 8.7% of newborns weighed more than 4000g. Bako M M. [11] and Camara S. [14] reported fetal macrosomia of 8.7% and 12%, respectively. We recorded 81% complete ruptures and 19% subserous ruptures. The site of rupture was segmental in 69.8% of cases, segmento-corporeal in 24.6% and corporeal in 5.5%. Bako M M. [11] reported 45% segmental rupture, 51.4% segmentocorporeal

fracture, and 3.6% corporeal rupture. Camara S. [14] had reported 80% complete ruptures. The site of rupture was anterior segmental in 42.8%. Diakité Y. [1, 5] reported 71.1% complete ruptures and 38.9% incomplete ruptures. We found 8.7% bladder lesions. Bako M M. [11] reported 13% uterine pedicle lesions, 3.6% vaginal lesions, and 1.4% bladder lesions. Koita R. [10] found 48% uterine pedicle lesions, 32% bladder lesions, and 12% vaginal lesions. Diakité Y [15] reported 10.9% uterine pedicle lesions, 4.8% cervical tears, 1.4% vaginal tears, and 0.7% bladder lesions. Treatment of any diagnosed rupture is surgical to ensure proper hemostasis. We performed simple hysterorrhaphy in 75.6% of parturients, and hysterorrhaphy plus tubal ligation and resection in 7.9% of parturients. Bako M. M. [11] found 47.1% simple hysterorrhaphy, 28.3% hysterorrhaphy plus tubal ligation and resection, Camara S. [14] reported 40% simple hysterorrhaphy. Our rate is lower than those of Fané K. [17] in MALI (91.9%), Guyot *et al.*, [24] in France (100%), Diaz *et al.*, [25] in the United States (91.7%). We performed a subtotal hysterectomy in 13.4% of parturients. This rate is higher than those of Diakité Y. [15] and Camara S. [14], which reported 13.2% and 10% respectively. Our rate is lower than that of Traoré M. [21], Gueye [8] and Goro M. [25] which reported 14.8%, 29.7% and 14.02% respectively. The high rate of hysterorrhaphy in this study could be explained by the speed of care and the parity of our parturients must also have played a role in the decision. It should be noted that 90.5% had been operated under general anesthesia and 9.5% under spinal anesthesia, where it was mainly a question of dehiscence of the old uterine scar diagnosed during the prophylactic caesarean section. Diakité Y. [1, 5] reported that 95.6% of parturients had been operated on under general anesthesia and 4.4% under spinal anesthesia. Medical resuscitation was pre-, intra- and post-operative in some patients. It was provided by infusion of Gelofusine in 74.2% of parturients, oxygen therapy in 33.9%, catecholamines in 29.1% and transfusion in 71.65%. Bako M M. [11], Camara S. [14] and Diakité Y. [15] reported 61%, 63.1% and 36% of transfusion cases respectively. 100% of parturients had received antibiotic therapy. The speed of diagnosis and treatment has contributed to the improvement of the maternal and fetal prognosis of this pathology. In our series, 40.94% of uterine rupture cases had complications. These complications were anemia (27%), parietal suppuration (3.2%), peritonitis (1.6%) and vesicovaginal fistula (1.6%). This rate is comparable to that of Bako M M. [11] who reported 23.9% anemia, 4.3% parietal suppuration and endometritis. Diakité Y. [16] reported 15.6% parietal suppuration, 7.4% endometritis, and 0.7% phlebitis. We recorded 10 cases of maternal death, i.e. 7.9%, including 1 death on arrival. Our rate is lower than those of Camara S. [14] and Bako M M. [11], which reported 13.1% and 9.4% respectively, and significantly higher than those of Diakité Y. [15] and Koita R. [10], which found 6.5% and 5% respectively. We found a statistical relationship between the nature of the rupture

and the postoperative outcome (P:0.003). Fetal mortality related to this pathology is very high. It is due to acute fetal distress related to the cessation of uteroplacental circulation. Thus we found 78.8% fetal death. This rate is higher than that of Diakité Y. [15] which reported 56%, and lower than that of Bako M M. [11] 82.6%. In our series, 25.4% of the newborns were alive, of which 14.17% had an Apgar score between 8 and 10 at the 1st minute. Bako M M. [11] had reported 15.5% live newborns of which 13.8% had an Apgar score between 8 and 10 at the 1st minute and Camara S [14] had reported 15.5% of live newborns of which 13.2% had an Apgar score between 7 and 10 at the 1st minute. We found a statistically significant association between the nature of uterine rupture and fetal condition (Person's Chi-square: 0.04).

CONCLUSION

Uterine rupture is an obstetric and surgical emergency. It is one of the leading causes of maternal mortality in Mali. The maternal and fetal fatality rates of this condition are very high. Early management has significantly reduced mortality and morbidity related to this complication of childbirth.

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