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Original Research Article

Laparoscopic management of ectopic pregnancy: a 34-month retrospective study at Amath Dansokho Regional Hospital Center, Kédougou, Senegal

Wade Mouhamadou*, Sarr Alfred Ndiaye, Seck Alexandre Oumar, Diouf Fallou,
Aminatou Yababba Moussa Gambo, Gueye Nogaye, Sané Doudou

Department of Obstetrics and Gynecology, Amath Dansokho Hospital, Kédougou, Senegal

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*Correspondence:

Dr. Wade Mouhamadou,

E-mail: wade200903kia@hotmail.fr

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ABSTRACT

Background: Ectopic pregnancy (EP) is a major gynecological emergency with significant incidence in rural settings where access to care is limited. Laparoscopic surgery is now recognized as the reference technique for EP treatment. This study reports the experience of the Amath Dansokho Regional Hospital Center of Kédougou in the laparoscopic management of EP.

Methods: A retrospective descriptive study was conducted on 30 patients operated by laparoscopy for EP between September 2022 and July 2025 at Amath Dansokho Regional Hospital Center, a rural level II hospital located 800 km from Dakar. Sociodemographic, clinical, surgical data and postoperative outcomes were analyzed.

Results: The mean age of patients was 26.3 years. The majority of EPs were located on the left fallopian tube (53.3%) and ruptured in 70% of cases. The laparoscopic management rate for EP was 71.4%. Anterograde salpingectomy was the main procedure in 80% of interventions. Postoperative outcomes were favourable with no conversion to laparotomy and an average hospital stay of 2 days.

Conclusions: Laparoscopy is a safe and effective technique for managing EP in rural settings, reducing morbidity and hospital stay. Its development in resource-limited areas requires capacity building and adequate training of medical teams.

Keywords: Ectopic pregnancy, Laparoscopy, Surgical management

INTRODUCTION

With an incidence of 0.85 per 1,000 pregnancies in Dakar, ectopic pregnancy (EP) represents a significant cause of maternal morbidity and mortality. It remains the leading gynecological emergency worldwide, with its incidence steadily increasing.^{1,2} Once considered fatal, it was Lawson Tait in 1888 who developed the surgical approach known as salpingectomy. Since then, the treatment of ectopic pregnancy has evolved, with the option of conservative treatment introduced by Stromme in 1953. Until 1972, laparotomy was the only way to treat ectopic

pregnancy.³ First performed in 1973 by Bruhat and Manhès in Clermont-Ferrand, laparoscopic treatment of ectopic pregnancy is currently considered as the gold standard.⁴ It was one of the very first surgical procedures performed using laparoscopy. This treatment can be conservative (salpingotomy) or radical (salpingectomy). The advantages of a laparoscopic approach to pregnancy have been reported by several authors. Compared to laparotomy, laparoscopy is associated with shorter surgery times, less intraoperative blood loss, and shorter operating times.⁵⁻⁷ Amath Dansokho Regional Hospital Center in Kédougou, which opened in 2021, has adopted this

minimally invasive approach, particularly in the treatment of gynecological emergencies. It is in this context that we decided to conduct this study, which aimed to evaluate laparoscopic management of ectopic pregnancy and assess its prognosis.

METHODS

Design, population and setting

This was a retrospective descriptive study conducted over a 34-month period, from October 1, 2022, to July 31, 2025. It was carried out in the department of gynecology and obstetrics at Amath Dansokho Regional Hospital Center in Kédougou, Senegal. 800 km from Dakar, the hospital is a level II Public Health Establishment opened on May 31, 2021. It is the referral maternity unit for the Kédougou region. It covers three districts: Kédougou, Salémata, and Saraya. Emergency obstetric, neonatal and gynecological care is provided 24 hours a day by a team including a gynecologist, a senior anesthesia technician, midwives and nurses. Gynecology visits, pre- and post-natal check-ups, family planning and ultrasound scans are carried out on a daily basis. Scheduled surgery is performed using a wide range of approaches (abdominal, vaginal and endoscopic).

The study included all patients who were admitted and underwent laparoscopic surgery for ectopic pregnancy at the department during the study period. A Sopro-Comeg laparoscopy tower was used for all procedures, along with standard instrumentation.

The operation procedure was as follows: patients were placed in the gynecological (lithotomy) position under general anesthesia. A 1 cm incision was made at the umbilicus, followed by the creation of a pneumoperitoneum using a Veress needle with an insufflation pressure of 12 mmHg. A sharp 11 mm umbilical trocar was then inserted blindly, followed by an initial exploration using a 10 mm umbilical optical trocar. Additional operative trocars were introduced based on

intraoperative findings. Typically, two 5 mm operative trocars were inserted under direct vision one in the right iliac fossa and the other in the right flank, spaced approximately five fingerbreadths apart. The operating table was tilted 15 degrees into the Trendelenburg position to expose the pelvis.

The parameters studied included: the frequency of ectopic pregnancy; the sociodemographic characteristics of the patients (age, gravidity, and parity); surgical history; indications for surgery; type of anesthesia used; procedures performed; postoperative course; conversions to open surgery; and postoperative complications.

Data analysis

The data was recorded in our E-Perinatal digital database. They were then extracted and analyzed, first in Microsoft Excel 2021 and then using the Statistical Package for Social Science (SPSS 26, Mac version). In the descriptive part, mean, median and standard deviation were considered to describe continuous variables while frequencies were reported for categorical and nominal variables.

RESULTS

During the study period, from October 1, 2022, to July 31, 2025, we recorded 62 cases of gynecological surgical emergencies, of which 49 were managed by laparoscopy, representing a utilization rate of 79% for emergencies. Surgery for ectopic pregnancy was by far the most common indication for emergency laparoscopy with a rate of 79%. Table 1 presents the distribution of the pathologies encountered and the surgical approach used. The average age of patients was 26.3 years, ranging from 19 to 36 years; 60% of patients were referred to our facility. The average distance travelled was 21.3 km, with the furthest patient residing 100 km away and the closest 4.3 km from the hospital. The average parity was 2.03.

Table 1: Distribution of emergency cases by surgical approach.

Pathologies	Surgical approach		
	Laparotomy N (%)	laparoscopy N (%)	Total N (%)
Ectopic pregnancy (EP)	11 (26.8)	30 (73.2)	41 (66.1)
Adnexal torsion	2 (14.3)	12 (85.7)	14 (22.5)
Hemorrhagic cyst	0	3 (100)	3 (100)
Tubo-ovarian abscess	0	3 (100)	3(100)
Others	0	1 (100)	1 (100)
Total (N: 62)	13 (21)	49 (79)	62 (100)

Spontaneous abortions and genital infections were the most common risk factors, with rates of 56%. We found a history of surgery in 20% of our patients. These included salpingectomy (3 cases), cesarean section, laparotomy, and laparoscopy for tubal surgery (Table 2).

General anesthesia was used in 100% of cases. Secondary amenorrhea was observed in all patients, with the principal motive of consultation being metrorrhagia associated with pelvic pain, at a rate of 70% (Table 3).

Table 2: Distribution of patients according risk factors and surgical history.

Characteristics	Frequency	Percentage
Risk factors for ectopic pregnancy (EP)		
Genital infections	8	26.6
Smocking	1	3.3
Ovulation inducer	2	6.6
History of abortion	9	30
Deep pelvic endometriosis	2	6.6
Ectopic pregnancy (EP)	3	10
None	5	16.7
Total	30	100
Surgical history		
Cesarean section	1	3.3
Salpingectomy	3	10
Tubal surgery	1	3.3
Other laparotomy	1	3.3
None	24	80
Total	30	100

Table 3: Distribution of patients according to reasons for consultation.

Reason for consultation	Frequency	Percent
Amenorrhea	30	100
Isolated metrorrhagia	4	13.3
Pelvic pain	4	13.3
Metrorrhagia + pelvic pain	21	70
Ultrasound diagnosis (incidental)	18	60
Total	30	100

Table 4: Characteristics at surgical exploration.

	Frequency	Percentage
Ectopic pregnancy (EP) characteristics (30 cases)		
Clinical presentation		
Ruptured	21	70
Unruptured	9	30
Location		
Left fallopian tube	16	53.3
Right fallopian tube	14	46.7
Tubal segment involved		
Ampullary	15	50
Infundibular	6	20
Isthmic	4	13.3
Cornual (interstitial)	5	16.7
Contralateral fallopian tube		
Normal	25	83.3
Abnormal	2	6.7
Absent	3	10

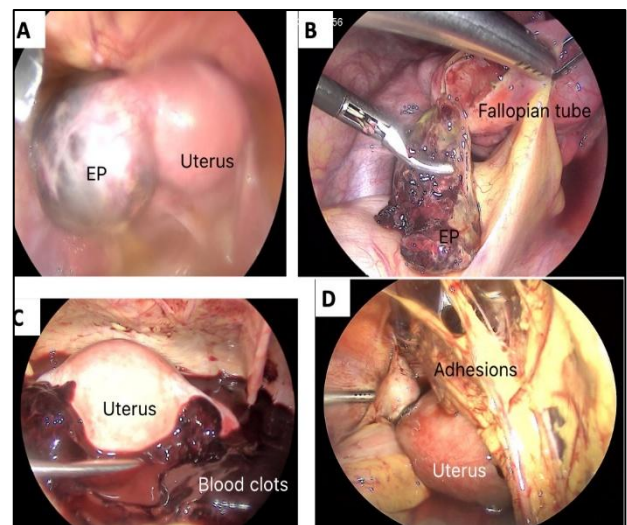
Eighteen patients, i.e., 60% of the sample, came in with an ultrasound scan suggesting an ectopic pregnancy. On laparoscopic exploration, all ectopic pregnancies were tubal, with 53.3% located in the left fallopian tube. The

pregnancy had ruptured in 70% of patients. The ectopic pregnancy was located in the ampulla in 15 patients. The contralateral tube was macroscopically healthy in 83.3% of cases and abnormal with adhesions in 6.7% of cases. In three cases, the tube was absent due to a previous salpingectomy. The data are summarized in Table 4, and Figure 1 illustrates some operative findings.

Salpingectomy was performed in the majority of cases, i.e., 90% (Table 5). In 80% of cases, this was an antegrade salpingectomy. Postoperative recovery was uneventful in 100% of cases, with an average hospital stay of 2 days. We observed no complications and no conversions to laparotomy were performed.

Table 5: Distribution of patients according to the surgical procedure performed.

Ectopic pregnancy		
Surgical procedure	Frequency	Percentage
Principal procedure		
Salpingotomy	3	10
Anterograde salpingectomy	24	80
Retrograde salpingectomy	3	10
Additional procedure		
Adhesiolysis	5	16.7
Cystectomy	2	6.6
Aucun	23	76.7

**Figure 1: Some operative findings: A) cornual EP, B) salpingotomy procedure (for unruptured EP), C) ectopic pregnancy with massive hemoperitoneum, D) EP with adhesions.**

DISCUSSION

Main results

During the study period, 42 cases of ectopic pregnancy were recorded. Among them, 30 were managed by laparoscopic surgery, 11 by laparotomy, and 1 by medical

treatment. Laparoscopy was therefore the most frequently used therapeutic approach with 71.4% of cases. The mean age of patients was 26.3 years (range: 19-36 years). Sixty percent of patients were referred from surrounding health centers, with an average transfer distance of 21.3 km (range: 4.3-100 km). Spontaneous abortions and genital infections were the most frequently identified risk factors, with rates of 32% and 24%, respectively. Metrorrhagia associated with pelvic pain in the context of amenorrhea accounted for 70% of the reasons for consultation. Ectopic pregnancy was ruptured in 70% of patients; it was predominantly ampullary and most often located in the left fallopian tube. Total salpingectomy was the most frequently performed surgical procedure, carried out in 90% of cases. The postoperative course was simple in all patients (100%), with an average hospital stay of two (2) days. No conversion to laparotomy was required (conversion rate: 0%).

Interpretation of results

In our series, laparoscopy was performed in 71.4% of patients, confirming its role as the gold standard in surgical management of ectopic pregnancy in gynecology-obstetrics department. However, this rate remains lower than that reported in western series. Data from the Auvergne registry (1992-1996) indicate that among 835 cases of ectopic pregnancy, 83% were managed exclusively by laparoscopy, 10% by laparotomy, and 7% by methotrexate.⁸ This difference can be attributed to factors such as patient profiles and, above all, the presence of specialized centers and intensive care units dedicated to laparoscopic surgery in Western countries. In our context, delayed diagnosis, long distances, and hemodynamic instability in patients with massive hemoperitoneum often lead to reluctance on the part of anesthesiologists to perform emergency laparoscopy. Furthermore, the facility has only one surgeon trained in this technique, and in his absence, laparoscopic activities are suspended. Despite these obstacles, our laparoscopy rate for ectopic pregnancies remains significantly higher than the 4.6% reported by Mbaye and the 21.6% observed by Assoumou.^{9,10} Our results are in line with the findings of Nkilly et al, who reported a rate of 61.43%.¹¹ Training local teams could help increase rates to levels closer to those observed in developed countries, which are approximately 90%. In these settings, conservative laparoscopic surgery (salpingotomy) is the most frequently employed approach.¹² In our series, however, due to the clinical profile of our patients, only three cases benefited from conservative management, while the remaining 90% underwent salpingectomy. Adhesiolysis was performed concurrently in 25% of cases.

The ectopic pregnancy was ruptured in 70% of patients, most often associated with massive hemoperitoneum. This predominance of ruptured ectopic pregnancies has also been reported by other African authors, as Hssain and Maiga, who found 73% and 72.58% of cases, respectively.^{13,14} Cultural reluctance to seek care; lack of

awareness of warning signs in early pregnancy, especially among young women; financial constraints; restrictions on seeking care imposed by partners. All these difficulties not only lead to delays in seeking medical advice, but above all to complications such as tubal rupture.

The ampullary location was predominant in our study population, consistent with findings reported in the literature.^{14,15}

This remains the most common site because the ampullary portion of the fallopian tube offers favorable conditions for implantation. It is highly distensible and flexible, with a thin muscular wall and a mucosa lined with deep folds. Other, rarer locations such as abdominal and ovarian ectopic pregnancies have also been described.¹⁴

The surgical procedure depends on the gestational age, local conditions, and the patient's desire for future fertility; a salpingectomy (radical treatment) or a salpingotomy (conservative treatment) may be performed. In our series, only two patients received surgical treatment. Our initial approach was salpingotomy; however, due to the local condition of the tube and the presence of rupture, we opted for the radical choice of salpingectomy.

Postoperative outcomes were uneventful for all operated patients, with a conversion rate of 0%. Similar postoperative findings have been reported in the literature.^{8,13} In our series, the mean operative time was 49 minutes, which progressively decreased over time. The average hospital stay was two days, comparable to the literature and shorter than the five-day stay reported by Hssain in Morocco.^{13,14}

Based on our results, laparoscopy appears to be an effective and safe technique; however, complications remain possible. Dufour reported, in a series of 109 cases of ectopic pregnancy, that among the 87 patients treated laparoscopically, 6% experienced hemorrhagic complications.¹⁵

Implication of results

The advantages of laparoscopic surgery compared with laparotomy, in terms of perioperative morbidity and mortality, have led to its increasingly widespread use in gynecological practice. It remains the gold standard for surgical treatment of ectopic pregnancy. The ability to perform minimally invasive surgery in a rural setting, where resources are limited, represents a significant achievement. However, for broader adoption of this technique, it is essential to provide training for local teams and to invest in appropriate equipment.

This study represents an interim assessment of the laparoscopic management of ectopic pregnancy in a rural setting. It highlights the usefulness of the laparoscopic approach, both as a diagnostic and therapeutic tool, in the management of ectopic pregnancy, as well as its

advantages in terms of reduced postoperative morbidity. However, it is limited by its retrospective design and the relatively small number of cases.

CONCLUSION

Laparoscopic management of ectopic pregnancy plays a crucial role in improving the quality of care, even in resource-limited medical settings. However, it also presents challenges related to the training of healthcare professionals and the funding of necessary equipment.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Cissé CAT, De Bernis L, Faye EHO, Diadhiou F. Ectopic pregnancy in Senegal. *Sante*. 2002;12(2):271-4.
2. Bamba K. Ectopic pregnancy; epidemiological, clinical, therapeutic, and prognostic aspects at the bougouni reference health centre medical thesis. University of Science, Technology and Engineering of Bamako; 2019: 102.
3. Goffinet F, Dreyfus M, Madelenat P. The French College of Gynecologists and Obstetricians. Recommendations for clinical practice: management of extra-uterine pregnancy. *Gynecol Obstet Fertil*. 2004;32:180-5.
4. Bruhat MA, Manhes H, Mage G, Pouly JL. Treatment of ectopic pregnancy by means of laparoscopy. *Fertil Steril*. 1980;33:411-41.
5. Murphy AA, Nager CW, Wujek JJ, Kettel LM, Torp VA, Chin HG. Operative laparoscopy versus laparotomy for the management of ectopic pregnancy: a prospective trial. *Fertil Steril*. 1992;57:1180-5.
6. Gray DT, Thorburn J, Lundorff P, Strandell A, Lindblom B. A cost-effectiveness study of a randomised trial of laparoscopy versus laparotomy for ectopic pregnancy. *Lancet*. 1995;345:1139-43.
7. Lundorff P, Thorburn J, Hahlin M, Kallfelt B, Lindblom B. Laparoscopic surgery in ectopic pregnancy. A randomized trial versus laparotomy. *Acta Obstet Gynecol Scand*. 1991;7.
8. Bouyer J, Job-Spira N, Pouly JL, Coste J, Germain E, Fernandez H. Fertility following radical, conservative -surgical or medical treatment for tubal pregnancy: a population based study. *BJOG*. 2000;107:714-21.
9. Mbaye M, Cissé ML, Gueye SM, Diemé ME, Diouf AA, Guye M, et al. Early outcomes of gynecologic colioscopy at Dakar University Hospital Center (CHU): a prospective series of 128 cases. *J Obstet Gynecol Canada*. 2012;34(10):939-46.
10. Assoumou Obiang P, Bang Ntamack JA, Makoyo Komba O, Minkobame ZM, Ngou Mve Ngou KJ, Minto'o EJ. Management of ectopic pregnancy at the Jeanne Ebori Foundation Mother and Child University Hospital in Libreville. *Health Sci Say*. 2022;23(2):129-32.
11. Edjo Nkilly G, Okoue Ondo R, Matsanga A, Sougou E, Manli D, Tchanchou TDD, et al. Taking in charge of ruptured extra-uterine pregnancies: coeliosurgery versus laparotomy. *Health Sci Dis*. 2020;21(6):21-4.
12. Lansac J, Gallet C, Rochet Y. Extrauterine pregnancy and its obstetrical prognosis (apropos of 135 cases). *J Gynecol Obstet Biol Reprod*. 1975;4(1):65-74.
13. Hssain H, Berrada R, El Ghanmi A, Ferhati D. Ectoperine pregnancy. *Maroc Med*. 2011;33(2):105-9.
14. Maiga M. Coelioscopic take-up of extra-uterine pregnancies in the "A" surgery service of Point-G CHU. 2023.
15. Koumare S, Soumare L, Sissoko M, Keita S, Camara M, Sacko O, et al. Evaluation of 15 years practice of coelioscopic treatment of ectopic pregnancy in the surgery department "A" at the University Hospital Point G. *Surg Sci*. 2018;9(11):454.
16. Dufour P, Gaubert P, Vinatier D, Bernardi C, Tiberghien B, Depret-Mosser S, et al. Celioscopic treatment of ectopic pregnancy. Results apropos of a series of 109 cases. *J Chir*. 1993;130(6-7):269-74.

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