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Overview of Laparoscopic Practice in the Management of Gynecological Emergencies at Amath Dansokho Regional Hospital Center in Kédougou, Senegal: 34-Month Prospective Study

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Abstract

Objectives: The objective of this study was to evaluate the management of gynecological surgical emergencies using laparoscopy in the Gynecology and Obstetrics Department of Amath Dansokho Regional Hospital Center, to identify its advantages, and to determine the obstacles to its implementation. **Patients and Methods**: This was a 34-month prospective study conducted from September 30, 2022, July 31, 2025, in the Gynecology and Obstetrics Department of Amath Dansokho Regional Hospital Center. All patients who were admitted and operated on by laparoscopy for a gynecological surgical emergency were included. Data collection and analysis were performed using Microsoft Excel 2021 and the **S**tatistical **P**ackage for **S**ocial **S**ciences (**SPSS 24, Mac version**). **Results**: The mean age was 28.02 years, ranging from 19 to 47 years. The average gravidity and parity were 2.5 and 2.1, respectively. Most patients were referred from surrounding health centers, with an average travel distance of 33.7 km (range: 4.3 km - 106.7 km). The main reasons for consultation were secondary amenorrhea and pelvic pain, accounting for 57.1% of cases. The most common conditions were ectopic pregnancy (66.1%) and ovarian cyst torsion (22.5%). Among the ectopic pregnancies, 21 out of 30 were ruptured. Total laparoscopic salpingectomy was the most frequently performed surgical procedure, in 90% of cases. Torsions were located on the left side in 7 out of 12 cases and were necrotic in 50%. The average operative time was 50 minutes. Preoperative complications occurred in 45.7% of cases, the majority of which required blood transfusion. No conversion to laparotomy was necessary. **Conclusion**: In the African context, where cultural be-

liefs often delay medical consultation, gynecological emergencies are typically diagnosed at an advanced stage, frequently leading to hemodynamic complications. Although laparoscopy is still underutilized in Africa, it is gradually gaining traction, with an increasing number of facilities adopting this surgical technique.

Keywords

Gynecological Surgical Emergencies, Laparoscopy, African Context

1. Introduction

Gynecological emergencies include all conditions affecting the female reproductive organs that require rapid assessment and treatment to prevent serious complications. The morbidity and mortality associated with these emergencies are more common in developing countries [1]. They mainly occur in patients with gynecological complaints (bleeding, lower abdominal pain, urinary tract infection, reported sexual assault, etc.), including pregnancies of less than 12 weeks of amenorrhea [2]. The serious risks to which patients are often exposed are largely due to a lack of hospital facilities, a shortage of qualified staff, low levels of education, poor socioeconomic conditions, and geographical inaccessibility of health services. The exploration and management of gynecological emergencies have greatly benefited from advances in laparoscopy. Laparoscopy represents a real revolution in modern surgery, not only from a technical point of view, but also in the overall approach to the management of gynecological pathologies. In 1994, it was estimated that 70% of gynecological surgery cases could be treated by laparoscopy [3]. Laparoscopy has been rapidly expanding in developed countries for the past two decades. However, its use remains limited in Africa. In Senegal, particularly in hospital facilities located outside major urban centers, access to and use of laparoscopy in emergency settings remain major challenges. At Amath Dansokho Hospital in Kédougou, the first laparoscopic procedures were performed in September 2022. After two years of using this technique in the hospital, it is essential to assess its impact, limitations, and potential areas for improvement. This retrospective study is part of that approach, with the primary objective of analyzing the use of laparoscopy in the management of gynecological emergencies at the Amath Dansokho Regional Hospital in Kédougou.

2. Methodology

2.1. Design, Population and Setting

This was a prospective 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. 700 km from Dakar, the hospital is a level II Public Health Estab-

lishment 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 admitted and operated by laparoscopy for gynecological emergencies. Excluded in this study emergencies gynecology surgery for vulvar trauma and per coital tears. A Sopro-Comeg laparoscopy tower was used for all procedures, along with standard instrumentation. The 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 gynecological chirurgical emergencies; 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.

2.2. 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.

3. 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. Table 1 presents the distribution of the pathologies encountered and the surgical approach used. In our context, the only contraindications for laparoscopy that led to emergency laparotomy were hemodynamic instability with hemorrhagic shock or the absence of a gynecologist trained in the technique. The mean age of the patients was 28.02

years, with extremes ranging from 19 to 47 years. The mean gravidity and mean parity were 2.5 and 2.1, respectively.

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%)**

Note: *n: number of cases, %: percentage.

The majority of patients managed by laparoscopy had no previous surgical history. Four (4) had a history of cesarean section, three (3) had a history of salpingectomy for ectopic pregnancy (EP), one (1) case had a history of laparotomy for deep endometriosis, and one (1) had a history of tubal plasty. Nearly 9 out of 10 patients (89%) were admitted following a referral to our facility. The average distance traveled was 33.7 km, with extremes ranging from 4.3 to 106.7 km from the hospital. Regarding the clinical and biological data of patients who underwent laparoscopy, secondary amenorrhea was the most frequent reason for consultation, reported in 65% of patients, followed by pelvic pain in 57.1%. Twenty-five patients (51% of the sample) arrived with an ultrasound suggestive of a diagnosis. Pregnancy diagnosis was confirmed by the standard pregnancy test. Plasma β-hCG measurement was performed urgently in only two patients. Ten patients had a hemoglobin level below 8 g/dL, accounting for 20.4% of the cohort.

The operative findings (Figure 1) and their characteristics are summarized in Table 2. The surgical procedure performed was total salpingectomy in 90% of ectopic pregnancies, and for adnexal torsion cases, 50% underwent cystectomy after detorsion of the adnexa. The procedures performed are detailed in Table 3. The average duration of the surgery was 50 minutes, with extremes ranging from 15 to 120 minutes. In 54% of patients, the surgery lasted between 30 and 45 minutes. The average length of hospital stay was 2 days, ranging from one (1) day to six (6) days. Only one postoperative complication was recorded, involving a patient with delayed awakening that required admission to the intensive care unit. For all 49 cases, the appropriate surgical procedures were performed laparoscopically, with no conversion to laparotomy, corresponding to a conversion rate of 0%.

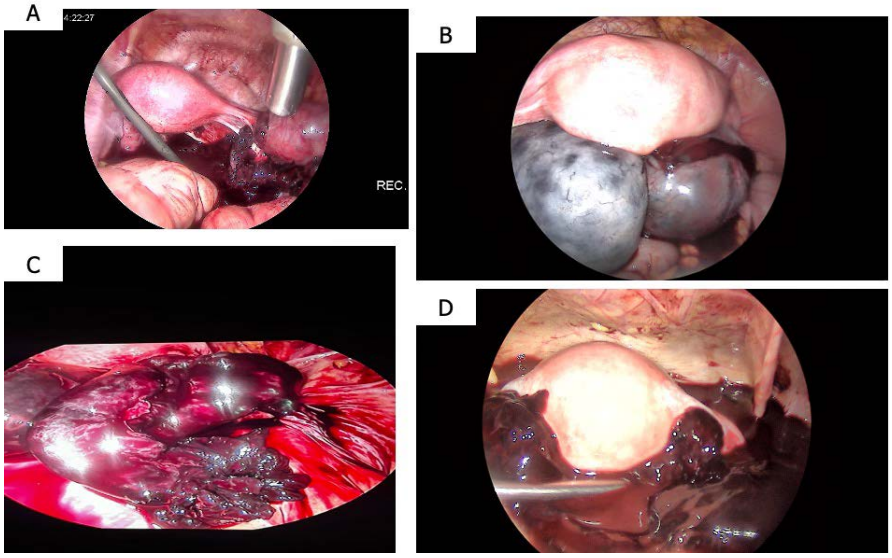

Figure 1. Laparoscopic findings. A: Right ruptured EP, B: Double adnexal torsion (ovary and fallopian tube), C: Adnexal torsion with necrosis, D: Ectopic pregnancy with massive hemoperitomium.

Table 2. Characteristics at surgical exploration.

	Frequency (n)	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%**
Adnexal Torsion Characteristics (12 cases)		
Location		
Left	7	**58.3%**
Right	4	**33.3%**

Continued

Bilateral	**1**	**8.4%**
	Numbers of twists	
1 turn	**5**	**41.6%**
2 turns	**4**	**33.3%**
+3 turns	**2**	**16.6%**
Double torsion	**1**	**8.4%**
	Necrosis	
Yes	**8**	**66%**
Non	**4**	**34%**
	Contralateral Adnexa	
Normal	**11**	**100%**
Abnormal	**1**	**8.3%**

Table 3. 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%
Adnexal Torsion		
Principal procedure		
Detorsion + cystectomy	6	50%
Detorsion + Adnexectomy	6	50%
Additional procedure		
Adhesiolysis	1	8.3%
None	11	91.7%
Other pathology		
Cystectomy for Ruptured hemorrhagic cyst	3	42.8%
Drainage + suction + peritoneal lavage for Tubo-ovarian abscess	3	42.8%
Exploration + biopsy for Ovarian tumor	1	14.4%
Total	**30**	**100%**

4. Discussion

The management of gynecological emergencies has been one of the primary indications for endoscopic surgery since the late 1970s. These techniques are now well established. In fact, in developed countries, the majority of emergency cases are managed by laparoscopy [4]. In our series, laparoscopy was performed in 79% of patients, making it the most commonly used surgical approach for gynecological emergencies in our daily practice. In Senegal, this rate is higher than that reported by Cissé at the Aristide Le Dantec Hospital, where laparoscopy was performed in 8% of cases [5]. In sub-Saharan Africa, lower rates have been reported by several authors: 24% by Makoyo [6] at the Libreville University Hospital Center in Gabon, 16.5% in Togo [7], and 8% at the Point G University Hospital in Mali, according to the study by Mafogue-Fotso [8]. On the other hand, in Western countries, laparoscopy is widely preferred, with rates reaching up to 95% [4]. Several factors limit access to this technique in resource-limited settings, including: restricted access to staff training, lack of equipment and consumables, inadequate organization of hospital structures, overload related to emergency obstetric care and non-urgent consultations. Our results can be attributed mainly to two factors: on the one hand, the availability of surgical and anesthetic teams trained in this technique, who are based in the facility and can be mobilized quickly; and on the other hand, the availability of the necessary equipment and supplies.

1. Ectopic Pregnancy

Ectopic pregnancy is the leading indication for emergency laparoscopy and is regarded as the "gold standard" approach [9]. We managed 30 cases of ectopic pregnancy by laparoscopy, representing a performance rate of 73.2% for. In our setting, diagnostic delays, long distances, and hemodynamic instability related to massive hemoperitoneum secondary to tubal rupture can constitute obstacles to performing 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 (73.2%) remains significantly higher than the 4.6% reported by Mbaye [10] and the 21.6% observed by Assoumou [11]. Our results are in line with the findings of Edjo G et al [12], who reported a rate of 61.43%. In contrast, a study based on data from the Auvergne registry reports that between 1992 and 1996, out of 835 ectopic pregnancies studied, 83% were treated exclusively by laparoscopy, 10% by laparotomy, and 7% by methotrexate [13]. This difference may be attributed to factors such as the profile of our patients who are most often admitted with tubal rupture and, in Western countries, the availability of specialized laparoscopy centers staffed with well-trained obstetrician-gynecologists on the spot. 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 [14]. 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.

2. Adnexal torsion and cyst rupture

Adnexal torsion accounted for 22.5% of the cases managed, making it a common clinical presentation. In our study, adnexal torsion was managed laparoscopically in 85.7% of cases, a rate significantly higher than those reported in West African series. In Senegal, Cissé reported frequencies of 4% in 2009 [15] and 6.25% in 2015 [16], while Makoyo found a rate of 3.8% in Gabon [6]. The primary complication of adnexal torsion is necrosis resulting from excessive diagnostic delay. In our cohort, necrosis was already present in the majority of cases, as patients typically sought care more than 24 hours after the onset of pain, often following initial consultations at other healthcare facilities. The severity of lesions observed during surgery depends on the duration of ischemia; however, the commonly cited six-hour rule does not apply to the ovary. Consequently, the time to diagnosis alone should not dictate the decision for oophorectomy or adnexectomy. In all cases, initial detorsion of the adnexa is systematically performed. In 50% of our patients, detorsion was accompanied by cystectomy, while in the remaining cases, adnexectomy was necessary following detorsion due to irreversible ischemia characterized by a black or greenish appearance of the adnexa, lack of color improvement after detorsion, and possible detachment from one or both vascular pedicles. This approach has been reported by several authors [12] [13]. Indeed, the initial clinical cases reported by Way and Manhès more than 40 years apart showed that recovery can be quite remarkable and lead to spontaneous intrauterine pregnancies in patients with single adnexa [17] [18]. We also treated two cases of adnexal torsion during pregnancy using laparoscopy, one at 21 weeks and the other in the first trimester at 12 weeks, in which detorsion and cystectomy were performed. During pregnancy, adnexal torsion is a rare emergency. It occurs most frequently in the first trimester of pregnancy but can be diagnosed at any gestational age. Laparoscopic management of adnexal pathologies in the first and second trimesters of pregnancy is no longer debated. Laparoscopy does not increase the risk of spontaneous abortion, preterm delivery, intrauterine growth restriction, or fetal malformations compared to laparotomy. It also carries a significantly lower risk of postoperative complications [19]. However, torsion of a healthy ovary during pregnancy is uncommon. In one case from our series, a patient referred from Guinea presented with torsion of a large 7 cm luteal ovary during the second trimester. Following detorsion, due to the friable and hemorrhagic appearance of the ovary, an adnexectomy was performed, resulting in a favorable outcome with the full-term vaginal delivery of a healthy newborn. This scenario is most commonly observed in cases of ovarian hyperstimulation syndrome during early pregnancy.

3. Upper genital tract infection

Diagnosing upper genital tract infections presents a clinical challenge, and additional investigations whether biological, bacteriological, or ultrasound are only useful when positive [20]. Prompt initiation of appropriate medical and surgical treatment is crucial, as this condition can be life-threatening and affect future fer-

tility. Accordingly, we managed three cases of upper genital tract infections complicated by unilateral tubo-ovarian abscesses using laparoscopy. In all three cases, careful adhesiolysis was performed under strict visual control, followed by drainage and thorough abdominal lavage. The patients were systematically placed on antibiotics in accordance with the 2019 recommendations of the French-Language Society for Infectious Diseases (SPILF) [21], which recommends antibiotic therapy targeting Chlamydiae Trachomatis, Neisseria gonorrhoeae, and anaerobic Gram-negative bacilli. The standard regimen is a triple antibiotic therapy combining ceftriaxone, doxycycline, and metronidazole [21]. In complicated upper genital infections with collections, the success rate of antibiotic therapy alone does not exceed 70%. When combined with abscess drainage, it reaches 90%. Currently, laparotomy is becoming less common in routine practice, with abscess drainage being performed by laparoscopy or ultrasound-guided transvaginal drainage [22].

4. Implications of findings

Laparoscopy offers significant benefits, particularly in rural areas. By modernizing healthcare services, it helps reduce costs and address inequalities in access to specialized gynecological care. The real challenge is to ensure the sustainability of this technique in rural areas. Indeed, it is essential to secure funding for the acquisition of necessary equipment and to provide continuous training for local surgeons; promote collaboration with specialized centers; develop partnerships with national and international universities and medical institutions; and, finally, encourage the mobility of specialists between urban and rural hospitals to facilitate the transfer of skills. Unfortunately, in Senegal, operative laparoscopy is not currently included in obstetrics and gynecology residency training. This skill must instead be acquired through a one-year certification program, which itself requires a prolonged apprenticeship under the supervision of a senior surgeon. To enhance accessibility, the costs of the procedure were adjusted to be equivalent to those of laparotomy for similar indications. Moreover, the benefits of laparoscopy such as shorter hospital stays and fewer postoperative complications, not only facilitate the rapid reintegration of patients into communities located far from hospitals but also contribute to reducing overall healthcare spending, ultimately making laparoscopy more cost-effective than laparotomy.

5. Strengths and limitations

This study is a review of the use of laparoscopy in rural areas. It highlights the usefulness of the laparoscopic approach, both diagnostic and therapeutic, in the surgical management of gynecological emergencies, as well as its advantages in terms of postoperative morbidity. Its limitations include its descriptive, as well as the limited number of cases.

5. Conclusion

Laparoscopy offers significant advantages in the management of gynecological surgical emergencies. In the African context, where culture and beliefs often constitute a barrier to medical consultation, gynecological emergencies are generally

diagnosed at an advanced stage, frequently leading to hemodynamic complications. The practice of emergency laparoscopy remains limited in Africa, but training for practitioners, funding, and support for facilities will help to popularize this technique.

Conflicts of Interest

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

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