

Feasibility and Safety of Laparoscopy in Pregnancy in Yaoundé, Cameroon

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How to cite this paper: Tompeen, I., Kiar, C.G.A., Ebong, C., Yaneu, J.N., Meka, E.N.U., Ndoua, C.C.N. (2025) Feasibility and Safety of Laparoscopy in Pregnancy in Yaoundé, Cameroon. *Open Journal of Obstetrics and Gynecology*, 15, 679-687.

<https://doi.org/10.4236/ojog.2025.154056>

Received: March 3, 2025

Accepted: April 7, 2025

Published: April 10, 2025

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Abstract

Introduction: Laparoscopy, a minimally invasive surgical technique, has revolutionized the management of various abdominal and pelvic conditions globally. Its application during pregnancy, once considered contraindicated due to potential risks such as fetal hypoxia, uterine injury, and preterm labor, is now increasingly recognized as a safe and effective approach when performed by skilled surgeons under appropriate conditions. In Cameroon, the practice of laparoscopy remains limited, particularly in the context of pregnancy where data are lacking. This study aims to address this gap by exploring the application of laparoscopy in pregnant patients in Yaoundé, Cameroon, with a focus on its feasibility and safety. **Methods:** From January 1, 2019, to December 31, 2024, we conducted a retrospective, descriptive cross-sectional study at Yaoundé Gynaeco-Obstetric and Pediatric Hospital (YGOPH), Cameroon. We included all pregnant women who underwent laparoscopic surgery during pregnancy. Data analysis was done by IBM SPSS 24, and results were expressed as mean, frequency and percentage. **Results:** A total of 896 patients underwent laparoscopic surgery during the study period and 24 patients had an active intrauterine pregnancy, giving a frequency of 2.6%. The mean age was 28.1 ± 4.1 years. Primiparous women were the most common with 59.1% of cases. Twenty-one (95.4%) pregnancies were mono-fetal with one heterotopic pregnancy. Of 22 laparoscopies performed, 15 (68.2%) were during the first trimester and 7 (31.8%) during second trimester. The gestational age ranged from 7 to 13 weeks. The main indications for surgery were adnexal torsion (40.9%)

and a large ovarian cyst (31.8%). No intraoperative complications were reported. The main pregnancy outcomes included one miscarriage at 18 weeks, one preterm vaginal delivery at 32 weeks and 20 (95.5%) term vaginal delivery. All Apgar score were > 7. The fetal weight ranged from 1800 g to 3500 g. After delivery, no fetal and maternal complications were recorded. **Conclusion:** Laparoscopic surgery during pregnancy is uncommon and seems to be feasible and safe in first and second trimester.

Keywords

Laparoscopy, Pregnancy, Feasibility, Safety, Cameroon

1. Introduction

The practice of surgery during pregnancy is not uncommon. Over the past decades, laparoscopy in pregnant women has become the surgical approach of choice after a period of controversy [1]. When compared to laparotomy, many advantages are associated with laparoscopy, including shorter lengths of hospital stay, quicker recovery, shorter operative times, and fewer postoperative complications [2]-[4]. However, laparoscopy during pregnancy has a number of disadvantages, such as the need for a general anesthetic, compromised uteroplacental perfusion due to pneumoperitoneum, fetal acidosis due to CO₂ absorption, and possible trauma to the uterus or fetus [5]-[8]. Therefore, its safety in terms of pregnancy outcomes, is still up for debate. Some results argue favorable pregnancy outcome [9] [10], while others report non-favorable issues [11] [12].

Worldwide, laparoscopy is commonly employed for managing various conditions. Adnexal masses are the most frequent gynecological indication for surgery during pregnancy, and they complicate about 2% of pregnancies [13]-[15]. The most common findings are torsion of an ovarian cyst, which may be corpus luteum cyst, dermoid cyst, endometrioma or functional cyst, and rarely a malignant tumor [13]. The two most frequent non-obstetric surgeries are respectively appendectomy and cholecystectomy [16] [17].

In high-resource settings, the feasibility and safety of laparoscopy during pregnancy have been well-documented. The guidelines published by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), demonstrates that laparoscopy can be safely conducted during any trimester of pregnancy [18]. However, other authors recommend the early second trimester of pregnancy, to decrease the risk of miscarriage in the first trimester and the possibility of preterm delivery in the third trimester [1]. Therefore, operative laparoscopy during pregnancy remains controversial. The adoption of this technique in low- and middle-income countries, including Cameroon, faces significant challenges.

In Cameroon, the practice of laparoscopy remains limited, particularly in the context of pregnancy where data are lacking. The overall accessibility and utilization of this technique are constrained by several factors. These include a lack of

trained personnel, limited availability of laparoscopic equipment, and the high cost of procedures. Additionally, cultural perceptions and inadequate awareness among healthcare providers and patients further hinder its widespread adoption.

The challenges specific to Cameroon highlight the need for localized studies to evaluate the feasibility and safety of laparoscopy during pregnancy. Such research is crucial for informing policy decisions, improving surgical training programs, and ultimately enhancing maternal and fetal outcomes. This study aims to address this gap by exploring the application of laparoscopy in pregnant patients in Yaoundé, Cameroon, with a focus on its feasibility and safety.

2. Methods

2.1. Study Design and Period

We conducted a descriptive cross-sectional study with retrospective data collection over a period of 5 years from January 1, 2019, to December 31, 2024, in the gynecology department of YGOPH.

2.2. Study Population

We enrolled all women who underwent laparoscopy during pregnancy during the study period, and whose pregnancy follow-up and outcome were well documented in a medical record. For those whose pregnancy outcome was not documented, we called them on the telephone and, after obtaining their consent, completed their medical records. Those with incomplete medical records who could not be contacted by telephone or who refused to give their consent were excluded. Were also excluded, all women with comorbidities that are potentially associated with adverse fetal outcome.

2.3. Ethical Considerations

Ethical considerations were respected on the anonymity and confidentiality of the collected data. This study was approved by the Institutional Review Board of YGOPH (Authorization N°672/CIERSH/DM/2024).

2.4. Operative Procedure and Pre-Operative Antenatal Care

All procedures were done under general anesthesia in YGOPH. Fetal heart monitoring was done preoperatively and post operatively by an obstetrical ultrasound. Intra-abdominal pressure of CO₂ was reduced between 10 to 12 mmHg. Tocolytic drug were systematically used after the surgery. Progesterone therapy was not used systematically, but only in patient who underwent ovarian cystectomy. Lung maturation was not done in all these patients.

2.5. Study Variables

For each file, the sociodemographic, clinical, pre operative and post operative data have been collected. Outcomes of interest were the following: Maternal complications, and fetal complications included induced, spontaneous or missed abortion;

intrauterine death and still birth, premature delivery and fetal distress.

2.6. Statistical Analysis

Data were recorded and analyzed with SPSS 26.0 software. Quantitative variables were expressed as mean \pm standard deviation and quantitative variables as absolute or relative frequency.

3. Results

A total of 896 patients underwent laparoscopic surgery during the study period, 24 of whom had a progressive intrauterine pregnancy, giving a frequency of laparoscopic surgery in pregnancy of 2.6%. Two patients were excluded, one with an incomplete file and the other who could not be contacted by telephone. Finally, we selected 22 patients.

The mean age was 28.1 ± 4.1 years, with extremes ranging from 18 to 37 years. The majority of patients (14/22) were less than 30 years.

The most common surgical indication were adnexal torsion (9/22) and symptomatic ovarian cysts (9/22). These two indications presented as an adnexal mass (18/22). One patient presented with multiple deep adenopathies in whom the diagnosis of lymphoproliferative syndrome was suspected. We reported a case of cervical incompetence in a patient with history of failure of two vaginal cerclage. It should be noted that the patient had vagina stenosis, making access to the cervix difficult for vaginal Shirodkar-type cervico-isthmic cerclage. **Table 1** summarizes the characteristics of the patients.

Table 1. Patients' characteristics.

| Patients' characteristics | n = 22 | % |
|---|--------------------------|------|
| Age | | |
| Means | 28.1 \pm 4.1 years | |
| [15 – 19] | 1 | 4.5 |
| [20 – 24] | 2 | 9.1 |
| [25 – 29] | 11 | 50 |
| [30 – 34] | 7 | 31.9 |
| ≥ 35 | 1 | 4.5 |
| Parity | | |
| Primipara | 13 | 59.1 |
| Multipara | 9 | 40.9 |
| Type of pregnancy | | |
| Monofetal | 21 | 95.4 |
| Heterotopic | 1 | 4.6 |
| Gestational age during the surgery | | |
| Mean | 12.4 week \pm 4.9 days | |

Continued

| Range | 7 weeks – 13 weeks 2 days | |
|----------------------------------|---------------------------|------|
| First trimester | 15 | 68.2 |
| Second trimester | 7 | 31.8 |
| Type of surgery | | |
| Emergency laparoscopy | 15 | 68.2 |
| Scheduled | 7 | 31.8 |
| Type of surgery | | |
| Emergency laparoscopy | 15 | 68.2 |
| Scheduled | 7 | 31.8 |
| Technique of entry | | |
| Open (Hasson's technique) | 11 | 50 |
| Veress technique | 5 | 22.7 |
| Direct entry | 6 | 27.3 |
| Indication of the surgery | | |
| Adnexal torsion | 9 | 40.9 |
| Ovarian cyst | 9 | 40.9 |
| Ectopic pregnancy (heterotopic) | 1 | 4.5 |
| Appendicitis | 1 | 4.5 |
| Cervical incompetency | 1 | 4.5 |
| Lymph node biopsy | 1 | 4.5 |

Pregnancy was carried to term in twenty participants (91%). Two patients gave birth prematurely, one at 29 weeks and the other at 32 weeks.

The patient at 29 weeks' gestation gave birth by caesarean section. The newborn had an Apgar of 6, with a birth weight of 1050 g. He died after two days' hospitalization in the neonatology department.

The second premature delivery involved a patient who had had a lymph node biopsy at 12 weeks' gestation. She spontaneously ruptured the membranes at 29 weeks (17 weeks after surgery). After in-patient management, she spontaneously went into labor at 32 weeks and gave birth to a 2000 g baby with an Apgar of 6.

Table 2 summarizes the Obstetrical and neonatal outcomes.

Table 2. Obstetrical and neonatal outcomes.

| Outcomes | N = 22 | % |
|--------------------------|--------|----|
| Delivery | | |
| Term delivery | 20 | 91 |
| Preterm delivery | 2 | 9 |
| Abortion | 0 | 0 |
| Route of delivery | | |

Continued

| | | |
|---|----|------|
| Vagina | 21 | 95.5 |
| Cesarian section | 1 | 4.5 |
| Maternal complications | 0 | 0 |
| Neonatal issues | | |
| Live birth | 22 | 100 |
| Birth weight (g) | | |
| <2500 | 2 | 9.1 |
| 2500 - 3500 | 16 | 72.7 |
| >3500 | 4 | 18.2 |
| Apgar score at the 5th minute | | |
| <7 | 1 | 4.5 |
| >7 | 21 | 95.5 |
| Neonatal death | 1 | 4.5 |

4. Discussion

Laparoscopic surgery is increasingly becoming the surgical approach in developing countries. Due to the lack of data on the practice of laparoscopy during pregnancy in Cameroon, we conducted this study over a 5-year period, from 2019 to 2024. In this study, laparoscopic surgery appears to be feasible and safe during pregnancy. A similar study was carried out in Gabon by Tchanchou [19] in 2019, and demonstrated the feasibility and safety of laparoscopy in pregnancy in developing countries. Recent updated studies [18] reported the safety of laparoscopy in pregnancy, even in the third trimester. As in Tchanchou [19] study in Gabon, none of patients underwent surgery in the third trimester. In fact, working space is limited, and laparoscopic access can be a challenge during this period.

Approximately 2 of every 1000 pregnant women undergo non-obstetric surgery [20]. In 5 years, we have only recorded 24 cases of laparoscopic surgery during pregnancy. With the development of training centers in laparoscopy and the equipping of most hospitals with laparoscopic surgery equipment, the practice of laparoscopic surgery will certainly increase in Cameroon.

In terms of outcomes, our study was not designed to allow a comparison between laparoscopy and laparotomy. This can be a limitation of our study. Therefore, the specific benefit due to laparoscopy, cannot be assessed. We encountered no maternal complications intraoperatively, and the majority of pregnant women who underwent the operation had a favorable pregnancy, delivery and neonatal outcomes. When compared to laparotomy, data regarding outcome after laparoscopy during pregnancy are controversial. Some results argue favorable pregnancy outcome [9] [10], while others report non-favorable issues [11] [12]. We did not record any abortions, despite the fact that in our study, 68.2% of interventions took place in the first trimester. We recorded two premature deliveries. One presented with prema-

ture rupture of membranes at 29 weeks (17 weeks after laparoscopy). She finally gave birth vaginally at 32 weeks. The second case of premature delivery was that of a patient who underwent laparoscopic cervico-isthmic cerclage, and delivery is systematically by caesarean section in this case [21]. The newborn had an Apgar of 6, with a birth weight of 1050 g. He died after two days' hospitalization in the neonatology department. These two premature deliveries do not appear to be directly linked to laparoscopy. According to the guidelines released by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), laparoscopy seems to offer similar benefits to pregnant and non-pregnant women compared to open surgery, and can be safely conducted during any trimester of pregnancy [18].

The majority of our procedures were performed as emergencies (68.2%), and adnexal torsion (40.9%) was the most frequent indication. These data are similar to those found in the literature [13]-[15], including that from Africa [19]. The risk of complications seems to be reduced when the diagnosis is made early in pregnancy and surgery is scheduled [22], even if most adnexal mass in pregnancy can be managed expectantly [1]. Regardless of the technique used to create the pneumoperitoneum, we did not record any complications at this stage of the surgery. The most commonly used laparoscopic entry techniques are open laparoscopy and Veress technique [19] [23] [24]. Although open laparoscopy was used in half of the cases, it should be noted that the direct technique can also be used, but in expert hands. This entry technique has also been reported by Tchanchou [19].

Although cases of laparoconversion have been described in the literature [23] [24], we did not have any cases in our series. Such cases can be related to more complicated abdominal pathology that may compromise the obstetrical outcome [25]. If the surgeon is inexperienced, this procedure should be encouraged to avoid maternal and/or fetal complications.

Our study has demonstrated the feasibility and safety of laparoscopy in pregnancy. The results on maternal and fetal outcome appear to be favorable. However, these results must be treated with caution, given the descriptive nature of the study and the lack of comparison with laparotomy.

5. Conclusion

Laparoscopic surgery during pregnancy is uncommon and seems to be feasible and safe in first and second trimester. When there is an indication and expertise in laparoscopic techniques, laparoscopy should be preferred to laparotomy, given its advantages.

Acknowledgements

We would like to thank the patients, who agreed to give us their consent for writing this article.

Conflicts of Interest

None declared.

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