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# Surgical Management and Postoperative Quality of Life in Women with Endometriosis: A Cross-Sectional Study from Two Hospitals in Yaoundé, Cameroon

**Isidore Tompeen[1,2*], Corine Tchuisse Yamendjeu[2], Clovis Ourtching[3], Kodoume Motolouze[1,2], Junie Ngaha[1,4], Cliford Ebong[2,5], Vanina Ngono Akam[2,6], Serge Nyada[2,6], Loïc Meukem Tatsipie[2], Julius Dohbit Sama[1,2], Esther Meka Ngo Um[1,2], Claude Noa Ndoua[2,6]**

[1]Department of Gynecology and Obstetrics, Yaoundé Gyneco-Obstetric and Pediatric Hospital, Yaoundé, Cameroon
[2]Department of Gynecology and Obstetrics, Faculty of Medicine and Biomedical Sciences, The University of Yaoundé I, Yaoundé, Cameroon
[3]Department of Gynecology and Obstetrics, Faculty of Medicine and Biomedical Sciences, The University of Garoua, Garoua, Cameroon
[4]Department of Gynecology and Obstetrics, Faculty of Medicine and Pharmaceutical Sciences, The University of Douala, Douala, Cameroon
[5]Department of Gynecology and Obstetrics, Yaoundé Central Hospital, Yaoundé, Cameroon
[6]Gynaecological Endoscopic Surgery and Human Reproductive Teaching Hospital, Yaoundé, Cameroon
Email: *isidore.tompeen@gmail.com

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## Abstract

**Background**: Endometriosis is a chronic inflammatory disease with a substantial impact on quality of life (QoL) and reproductive health. In sub-Saharan Africa, delayed diagnosis and limited access to specialized care often result in advanced disease at the time of surgery. This study aimed to describe the surgical characteristics and assess postoperative quality-of-life outcomes among women operated for endometriosis in two referral hospitals in Yaoundé, Cameroon. **Methods:** We conducted a retrospective descriptive and analytical study involving women surgically treated for endometriosis between January 2018 and December 2023 at the Yaoundé Gyneco-Obstetric and Pediatric Hospital. Medical records of patients who underwent surgery for endometriosis were retrospectively reviewed. Sociodemographic, clinical, imaging, surgical, and postoperative data were extracted from 50 medical records. Pain intensity was assessed using the Visual Analog Scale (VAS), and quality of life was evaluated using the Endometriosis Health Profile-5 (EHP-5) questionnaire before and after surgery. **Results:** The mean age was 31.1 ± 5.5 years. The most common phenotypes were superficial endometriosis (68%). Advanced disease predom-

inated, with a mean endometrioma diameter of 94.1 mm and a 36.4% prevalence of "kissing ovaries." Deep infiltrating endometriosis (DIE) was identified in 38% of cases, including rare diaphragmatic and hepatic involvement. Moderate to severe disease (rASRM stages III-IV) was present in 70.3% of staged cases. Laparoscopy was the primary surgical approach (88%). A significant postoperative reduction in pain was observed, with the mean VAS score decreasing from 9.5 ± 1.1 to 3.7 ± 2.7 ($p < 0.001$). The EHP-5 score significantly improved from 698.8 ± 171.0 to 350.6 ± 219.5 ($p < 0.001$). Surgical complications were infrequent (6%). Postoperative conception occurred in 3 of 14 (21.4%) patients followed for infertility. **Conclusion:** In our Cameroonian cohort, endometriosis predominantly affects young, nulliparous women, often presenting with moderate-to-severe disease. Surgical management, predominantly laparoscopic, is associated with significant and meaningful improvements in pelvic pain and quality of life. These findings underscore the critical need for improved diagnostic capabilities and access to advanced laparoscopic surgery in our setting to mitigate the profound personal and societal burden of this disease.

## Keywords

Endometriosis, Surgery, Laparoscopy, Quality of Life, Cameroon

## 1. Introduction

Endometriosis, defined by the presence of endometrial-like tissue outside the uterine cavity, is a chronic inflammatory condition affecting an estimated 10% of women of reproductive age globally [1]. It is a leading cause of chronic pelvic pain, dysmenorrhea, dyspareunia, and infertility, imposing a substantial burden on physical health, mental well-being, socioeconomic productivity, and diminished quality of life [2] [3].

In high-income countries, increased awareness and access to advanced imaging and laparoscopy have improved early diagnosis and management. For decades, a persistent medical myth suggested that endometriosis was rare among women of African descent. Recent evidence has decisively debunked this, revealing that African women often suffer from more aggressive, late-stage phenotypes due to systemic diagnostic delays [4]. However, endometriosis remains underdiagnosed and often misinterpreted as a functional or psychosomatic condition. Cultural normalization of menstrual pain, limited specialist availability, and financial barriers contribute to diagnostic delays, resulting in more extensive disease at the time of surgery [5].

The management of endometriosis is multimodal, encompassing medical therapy, surgery, and often, assisted reproductive technologies. Surgery, particularly laparoscopic excision, plays a pivotal role in providing a definitive diagnosis, relieving pain, improving fertility in specific cases, and treating associated complications [6] [7]. The primary goals of surgical intervention are the complete re-

moval of all visible endometriotic lesions, restoration of normal pelvic anatomy through adhesiolysis, and symptom alleviation.

Despite its global prevalence, the clinical profile and surgical outcomes of endometriosis in Sub-Saharan Africa (SSA) remain poorly characterized. Diagnostic delays are common due to limited access to advanced imaging (e.g., magnetic resonance imaging) and specialized gynecological care, often leading to presentation at advanced disease stages [8] [9]. Furthermore, the availability and outcomes of laparoscopic surgery, the gold standard for endometriosis management, are not well-documented in many African contexts.

In Cameroon, as in many SSA countries, there is a critical gap in data regarding the patient-reported outcomes following intervention. Understanding the local epidemiological and clinical landscape is essential for developing context-appropriate guidelines and advocating for the necessary resources.

Quality of life is now recognized as a key outcome measure in endometriosis management, alongside traditional surgical and fertility endpoints. Validated instruments such as the Endometriosis Health Profile (EHP-5) allow standardized assessment of patient-centered outcomes [10].

This study aimed to bridge this knowledge gap by describing the surgical aspects and evaluating the impact on quality of life and pain in women who underwent surgery for endometriosis in two hospitals in Yaoundé, Cameroon. We sought to provide evidence on the feasibility and effectiveness of surgical management within our resource-constrained setting.

## 2. Methods

### 2.1. Study Design and Setting

This was a hospital-based, descriptive cross-sectional and analytical study with retrospective data collection on clinical/surgical profiles and prospective assessment of postoperative outcomes. The study was conducted at two facilities: the Yaoundé Gynaeco-Obstetric and Pediatric Hospital (HGOPY), a public tertiary referral center, and the Afrique Futur Deo Gracias Hospital in Emana, a private institution. Both centers offer specialized gynecological surgical services in Yaoundé.

### 2.2. Study Population

Between July 2018 and July 2023, we included all women aged 18 years and above who underwent surgical intervention (laparoscopy or laparotomy) with a histologically or surgically confirmed endometriosis, with a complete operative report, and available pre- and postoperative clinical data. Patients with incomplete medical records or those who underwent surgery for other primary indications with an incidental finding of endometriosis were excluded.

### 2.3. Data Collection

Data were collected in two phases:

1) Retrospective Phase: A structured data extraction sheet was used to collect information from medical records, including sociodemographic characteristics (age, parity, occupation, education), clinical history (symptoms, duration, infertility status), preoperative investigations (ultrasound, CA-125, MRI), intraoperative findings (phenotypes: superficial, ovarian endometrioma, deep infiltrating endometriosis; location; the revised American Society for Reproductive Medicine (rASRM) stage), surgical details (approach, procedures performed), and perioperative complications.

2) Prospective Phase: Eligible patients were contacted by telephone. After obtaining informed consent, they were interviewed using two validated tools: the Visual Analogue Scale (VAS) to assess current pelvic pain intensity (0 = no pain, 10 = worst imaginable pain) and the Endometriosis Health Profile-5 (EHP-5) questionnaire to evaluate health-related quality of life. The EHP-5 scores [10] range from 0 (best health) to 100 (worst health) per domain; a higher score indicates poorer QoL. Preoperative EHP-5 scores were not available in archived medical records and were therefore assessed retrospectively during the postoperative telephone interview. Patients were asked to recall their preoperative health status using the EHP-5 questionnaire, referring specifically to their condition immediately prior to surgery. Patients were also asked about postoperative conception.

## 2.4. Operational Definitions

**Superficial Endometriosis:** Peritoneal implants without significant infiltration.

**Ovarian Endometrioma:** Ovarian cyst with typical "chocolate" fluid content.

**Deep Infiltrating Endometriosis (DIE):** Endometriotic lesions infiltrating the retroperitoneal space or the wall of pelvic organs to a depth of ≥5 mm (e.g., uterosacral ligaments, rectovaginal septum).

**rASRM Stage:** Disease severity classified according to the revised American Society for Reproductive Medicine classification [11].

## 2.5. Ethical Considerations

The study protocol was approved by the Institutional Ethics Committees of both participating hospitals. For the retrospective component, a waiver for individual informed consent was granted for the analysis of anonymized archived data. For the prospective telephone interview, verbal informed consent was obtained from all participants at the beginning of the call. All data were anonymized and kept confidential.

## 2.6. Statistical Analysis

Data were entered and analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics were computed. Categorical variables were expressed as frequencies and percentages (%). Continuous variables were expressed as mean ± standard deviation (SD) or median with interquartile range (IQR) as appropriate. The paired samples t-test or Wilcoxon signed-rank test was used to compare preoper-

ative and postoperative VAS and EHP-5 scores, as appropriate. A p-value of <0.05 was considered statistically significant.

## 3. Results

### 3.1. Flow of Participants and Sociodemographic Characteristics

A total of 92 patients were identified as having undergone surgery for endometriosis. After applying exclusion criteria, 50 patients constituted the final study population (Figure 1).

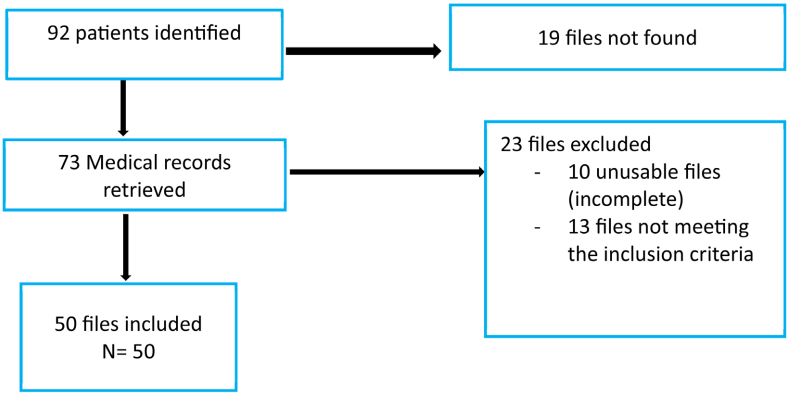


Figure 1. Flow diagram.

The mean age at surgery was 31.1 ± 5.5 years, with the 30 - 35 age group being most represented (34%). The majority were single (52%), had a university-level education (74%), and resided in urban areas (84%). A striking 80% were nulliparous (Table 1).

Table 1. Sociodemographic characteristics.

| Characteristics | N = 50 | % |
|---|---|---|
| **Age** | | |
| Means ± SD | 31.1 ± 5.5 | |
| Range | 20 - 42 | |
| [20 - 25[ | 6 | 12 |
| [25 - 30[ | 13 | 26 |
| [30 - 35[ | 17 | 34 |
| [35 - 40[ | 9 | 18 |
| [40 - 45] | 5 | 10 |
| **Level of education** | | |
| Higher education | 37 | 74 |
| Secondary | 11 | 22 |
| Primary | 1 | 2 |
| None | 1 | 2 |

Continued

| | | |
|---|---|---|
| **Marital Status** | | |
| Single | 26 | 52 |
| Married | 24 | 48 |
| **Parity** | | |
| Nulliparous | 40 | 80 |
| Primiparous | 4 | 8 |
| Pauciparous | 2 | 4 |
| Multiparous | 2 | 4 |
| **Residence** | | |
| Urban | 42 | 84 |
| Rural | 8 | 16 |

### 3.2. Clinical Presentation and Phenotypes

Dysmenorrhea was nearly universal (96%), followed by chronic pelvic pain (54%) and deep dyspareunia (66%). Infertility was a presenting complaint in 44% of patients (primary: 68.2%, secondary: 30.4%). Preoperative workup relied heavily on pelvic ultrasound (34% had a specific mention), with fewer patients undergoing CA-125 testing (18%) or MRI (8%).

The most frequent phenotypes encountered were superficial peritoneal endometriosis (68%) and ovarian endometriomas (66%). Deep infiltrating endometriosis was present in 38% of cases, most commonly involving the uterosacral ligaments (73.7% of DIE cases) and causing partial or complete obliteration of the pouch of Douglas (38% of all patients and 100% of DIE). Among the 27 patients formally staged, moderate (Stage III, 44.4%) and severe (Stage IV, 25.9%) disease were predominant (Table 2).

Table 2. Clinical presentation and phenotypes.

| Characteristics | N = 50 | % |
|---|---|---|
| Chronic pelvic pain | 27 | 54 |
| Dysmenorrhea | 48 | 96 |
| Deep dyspareunia | 33 | 66 |
| **Infertility** | 22 | 44 |
| Primary | 15 | 68.2 |
| Secondary | 7 | 31.8 |
| **Endometriosis phenotypes** | | 25 |
| Superficial endometriosis | 34 | 68 |
| Endometrioma | 33 | 66 |
| Deep endometriosis | 19 | 38 |

Continued

| | | |
|---|---|---|
| **Deep endometriosis** | **19** | **38** |
| Uterosacral ligament | 14 | 73.7 |
| Rectovaginal septum involment | 6 | 31.6 |
| Pouch of Douglas | 19 | 100 |
| Diaphragm | 1 | **5.3** |
| Liver | 2 | **10.5** |
| **Endometrioma** | 33 | 66 |
| Left | 15 | 45.5 |
| Right | 6 | 18.2 |
| Bilateral | 12 | 36.4 |
| Kissing ovaries | 12 | 36.4 |
| **rASRM classification (n = 27)** | | |
| Stage I | 4 | 14.8 |
| Stage II | 4 | 14.8 |
| Stage III | 12 | 44.4 |
| Stage IV | 7 | 25.9 |

### 3.3. Surgical Management

Laparoscopy was the primary surgical approach in 88% of cases (n = 44). For ovarian endometriomas (n = 33), cyst drainage was systematically done, followed by complete cyst wall excision (36.4%). Adhesiolysis was performed in 86% of patients. Surgical treatment of superficial peritoneal lesions (fulguration or excision) was performed in 34% of cases. For DIE, nodule resection was undertaken in 24% of all patients, with shaving of rectal nodules being the most frequent bowel procedure (10% of all patients). The intraoperative complication rate was low (6%), consisting of hemorrhages requiring transfusion (Table 3).

Table 3. Surgical management.

| Characteristics | N = 50 | % |
|---|---|---|
| **Route of surgery** | | |
| Laparoscopy | 44 | 88 |
| Laparotomy | 6 | 12 |
| **Endometrioma** | 33 | 66 |
| Cyst drainage | 33 | 100 |
| Complete cyst wall excision | 12 | 36.4 |
| Incomplete cyst wall excision | 3 | 9 |

Continued

| | | |
|---|---|---|
| **Superficial endometriosis** | 17 | 34 |
| Fulguration | 9 | 52.9 |
| Excision | 8 | 47.1 |
| Adhesiolysis | 43 | 86 |
| **Deep endometriosis** | 12 | 24 |
| Partial resection of the nodule | 7 | 58.3 |
| Complete resection of the nodule | 5 | 41.7 |
| Shaving of rectal nodule | 5 | 41.7 |
| **Intraoperative complication** | 3 | 6 |
| hemorrhage | 3 | 6 |

### 3.4. Postoperative Outcomes

The mean hospital stay was 3.4 ± 0.9 days. Postoperative medical therapy was prescribed for only 18% of patients (Triptorelin: 14%, Combined Oral Contraceptives: 4%).

Pain and quality of life outcomes showed dramatic improvement. The mean preoperative VAS score of 9.5 ± 1.1 decreased significantly to 3.7 ± 2.7 postoperatively ($p < 0.001$). Among patients providing follow-up data, 75.7% reported a decrease in pain intensity, and 24.3% reported complete resolution (Table 4).

Table 4. Comparison of the VAS score before and after the surgery.

| Variables | N = 50 | p-value[2] |
|---|---|---|
| **Maximum intensity of preoperative pain** | | <0.001 |
| Mean ± SD | 9.5 ± 1.1 | |
| Median [IQR] | 8.0 [7.8 - 9.0] | |
| Range | 1.0 - 8.1 | |
| **Maximum intensity of postoperative pain** | | <0.001 |
| Mean ± SD | 3.7 ± 2.7 | |
| Médian [IQR] | 4.0 [2.0 - 4.0] | |
| Range | 0.0 - 9.0 | |
| **postoperative pain evolution** | | |
| Decrease in intensity | 28 (75.7%) | |
| Complete regression | 9 (24.3%) | |
| Persistence of pain | 13 (35.13%) | |

Paired preoperative and postoperative EHP-5 scores were available for 43 patients. Seven patients were excluded from paired analysis due to loss to follow-up

(n = 7). The mean EHP-5 score improved significantly from 698.8 ± 171.0 preoperatively to 350.6 ± 219.5 postoperatively ($p < 0.001$). The proportion of women with a "poor" QoL (EHP-5 score > 550) fell from 86% preoperatively to 18.6% postoperatively (Table 5).

Table 5. Comparison of the EHP score before and after the surgery.

| Variables | Before, N = 43 | After N = 43 | p-value |
|---|---|---|---|
| **EHP-5 score** | | | <0.001 |
| Mean ± SD | 698.8 ± 171.0 | 350.6 ± 219.5 | |
| Median [IQR] | 750.0 [587.5 - 812.5] | 325.0 [231.3 - 587.5] | |
| Range | 150.0 - 950.0 | 0.0 - 825.0 | |
| **EHP-5 score categories** | | | <0.001 |
| [0, 550] | 6 (14.0%) | 35 (81.4%) | |
| [550, 950] | 37 (86.0%) | 8 (18.6%) | |

Among the 14 infertile patients available for fertility follow-up, 3 (21.4%) achieved spontaneous conception post-surgery. Of these, one pregnancy was ongoing, and two ended in first-trimester miscarriage.

## 4. Discussion

This study provides a comprehensive snapshot of the surgical management of endometriosis in a Cameroonian urban setting, highlighting both the significant burden of the disease and the tangible benefits of surgical intervention. Our findings contribute to the sparse literature on endometriosis in Central Africa and offer insights relevant for clinical practice and health system planning. These findings confirm that women in this setting present at a young age but with advanced disease, consistent with reports from other African data [4] [5].

The demographic profile of our cohort, young (mean age 31 years), predominantly nulliparous (80%), and highly educated, aligns with classic descriptions of endometriosis patients globally, often characterized by delayed childbearing [12]. However, the strikingly high rates of nulliparity and nulligestation in our study may reflect a dual reality: the disease's impact on fertility and potential sociocultural factors influencing marriage and pregnancy timing in our context. The overwhelming urban residence (84%) likely indicates disparities in healthcare access, where rural women with chronic pelvic pain may never receive a definitive diagnosis.

The clinical presentation was dominated by severe pain, with near-universal dysmenorrhea and high rates of deep dyspareunia and chronic pelvic pain. This "pain triad" is a hallmark of endometriosis and its significant impact is quantitatively confirmed by the exceedingly high preoperative VAS (9.5/10) and EHP-5 scores [13]. The 44% prevalence of infertility is consistent with global estimates

and underscores endometriosis as a major cause of tubal and peritoneal factor infertility [1] [14].

The distribution of disease phenotypes reveals important patterns. While superficial disease and endometriomas were common, the 38% prevalence of DIE is notable. This is higher than some early laparoscopic series but resonates with more contemporary studies suggesting DIE is frequently underdiagnosed without adequate expertise [15] [16]. The high proportion of moderate-to-severe rASRM stages (70.3%) points to substantial diagnostic delay, a critical challenge in low-resource settings where symptom normalization and limited access to specialized care are prevalent [4] [8]. The reliance on ultrasound over MRI reflects resource constraints, yet pelvic ultrasound, when performed by trained personnel, can accurately diagnose endometriomas and suggest DIE [17].

The surgical approach was encouragingly minimally invasive, with 88% of procedures initiated laparoscopically. This demonstrates that advanced laparoscopic surgery for complex benign gynecology is feasible in our setting with appropriate training and infrastructure. The surgical techniques employed, however, reveal a pragmatic approach. During laparoscopic management of ovarian endometriomas, cyst drainage and hemostasis were performed using bipolar electrosurgical energy. No ultrasonic or advanced energy devices were routinely available during the study period. The preference for cyst drainage over excision for endometriomas, while less optimal for preventing recurrence, may be influenced by concerns over ovarian reserve and the technical difficulty of complete excision in the presence of dense adhesions [18] [19]. However, this may be a double-edged sword, as drainage is associated with higher recurrence rates and may contribute to the 35% of patients experiencing persistent pain. The relatively low rate of complete resection of deep nodules (41.7% of those resected) highlights the technical complexity of DIE surgery and the need for multidisciplinary teams, which may not be routinely available [20].

The core finding of this study is the profound improvement in patient-reported outcomes. The statistically and clinically significant reduction in pain (VAS decrease of 5.8 points) and the dramatic improvement in EHP-5 scores represent a transformative effect of surgery on women's lives. These results are comparable to or even exceed those reported in high-income settings following laparoscopic excision, affirming the effectiveness of surgical care when it is accessible [21] [22]. The fact that only 18% of patients received postoperative hormonal suppression (primarily Triptorelin) suggests that symptom relief was largely attributable to surgery itself. This is an important consideration in contexts where long-term medical therapy may be unaffordable or poorly tolerated. The low utilization of postoperative hormonal therapy reflects a combination of factors specific to our context, including financial constraints, limited access to long-term hormonal treatments, patient preference, and the absence of standardized local postoperative protocols. In addition, some providers prioritized surgical symptom relief alone, particularly in patients desiring pregnancy, thereby limiting the prescrip-

tion of suppressive hormonal therapyQuality-of-life improvement after surgery, underscores that, even in resource-limited settings, surgical treatment can yield meaningful patient-centered benefits. However, the modest fertility outcomes highlight the need for earlier diagnosis and integrated fertility care.

The fertility outcomes, while based on a small subset, are cautiously promising, with a 21.4% spontaneous conception rate. This aligns with studies showing improved natural conception rates after surgery for mild-to-moderate endometriosis [23]. The high rate of first-trimester miscarriage (66.6% of pregnancies) is concerning and warrants further investigation into potential associated factors like untreated inflammation or autoimmune phenomena linked to endometriosis [24] [25].

This study has several strengths, including its focus on patient-centered outcomes using validated tools (VAS, EHP-5), the combined data from public and private sectors, and the detailed reporting of surgical phenotypes. However, limitations must be acknowledged. The sample size, though robust for the local context, limits subgroup analyses. The cross-sectional design with retrospective clinical data collection is susceptible to information bias. The follow-up period for fertility assessment was variable and likely insufficient to capture all potential conceptions. We lacked a control group (e.g., medical management only) and data on long-term recurrence rates. The reliance on telephone interviews for outcome assessment, while practical, may introduce recall bias. This retrospective assessment of baseline EHP-5 scores introduces a potential recall bias, as patients' recollection of preoperative quality of life may be influenced by their postoperative improvement. This limitation should be considered when interpreting the magnitude of change in EHP-5 scores.

## 5. Conclusion and Recommendations

This study demonstrates that endometriosis in Yaoundé presents as a severe, pain-inducing condition, often diagnosed at advanced stages and primarily affecting young nulliparous women. Surgical management, predominantly laparoscopic, is strongly associated with significant improvements in pain and quality of life, representing a vital therapeutic pathway.

To build upon these findings, the authors recommend the following actions:

- Enhance diagnostic capacity through training in advanced pelvic ultrasound and improved access to MRI for suspected deep infiltrating endometriosis (DIE) to reduce diagnostic delays.
- Strengthen surgical training and multidisciplinary care by supporting specialized training in laparoscopic deep excisional surgery and fostering collaboration with colorectal and urological surgeons for complex DIE cases.
- Develop integrated postoperative care through standardized protocols for hormonal suppression and structured fertility counseling, bridging surgical and reproductive medicine services.
- Promote patient advocacy and awareness via public and professional education campaigns to destigmatize chronic pelvic pain and encourage early referral.

- Advance prospective research by establishing a national endometriosis registry to track long-term surgical outcomes, recurrence rates, and fertility success, thereby generating robust local evidence to inform policy and practice.

Effectively addressing endometriosis in Sub-Saharan Africa requires a concerted effort to bridge the gap between the significant unmet need and the demonstrated potential of surgical care to restore health and hope.

## Authors' Contributions

All authors who contributed to this work have declared that they have read and approved the final version of the manuscript.

## Conflicts of Interest

The authors have no conflicts of interest to declare regarding the publication of this manuscript.

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