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Abdominal versus Vaginal Hysterectomy: A Comparative Study at a Sub-Saharan Referral Hospital

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Abstract

Background: Hysterectomy is a common gynecological procedure, with the vaginal route and minimally invasive techniques preferred in high-income countries due to better outcomes. In contrast, low- and middle-income countries (LMICs), including Cameroon, still predominantly use the abdominal approach, often due to limited surgical training, late-stage presentations, and infrastructural constraints. Given the lack of recent comparative data in this setting, this study evaluates perioperative and postoperative outcomes of both approaches at a major referral hospital in Sub-Saharan Africa. **Objective:** To compare perioperative and postoperative outcomes between abdominal and vaginal hysterectomy at the Douala General Hospital. **Methods:** This cross-sectional study included 215 patients who underwent hysterectomy (abdominal or vaginal) between January 1, 2019, and December 31, 2023. Data were extracted from patient files and analyzed using means (±SD) for quantitative variables and percentages for qualitative variables. Chi-square and Fisher's exact tests were used for comparisons (significance at $p \leq 0.05$). **Results:** The mean age was (49.65 ± 8.63) years, with an average parity of 3.69. Abdominal hysterectomy accounted for 88.8% of cases, while vaginal hysterectomy represented 11.2%. Primary indications were uterine fibroids (55.5%, abdominal) and cervical dysplasia (41.7%, vaginal). Compared to vaginal hysterectomy, abdominal hysterectomy had: 1) Longer operative time (184 vs. 136 minutes,

$p < 0.001$); 2) Higher cost (US415 vs. US415 vs. US379, $p = 0.02$); 3) Extended hospital stay (6 vs. 3 days, $p < 0.001$); 4) Intraoperative hemorrhage (9.4% vs. 4.2%, $p = 0.05$) and postoperative anemia (46.3% vs. 20.8%, $p < 0.001$) were more frequent with the abdominal approach; 5) Patients resumed daily activities earlier after vaginal hysterectomy ($p = 0.007$); 6) No significant difference was observed in self-reported sexual function impact ($p = 0.25$). **Conclusion:** Despite the predominance of abdominal hysterectomy in our setting, vaginal hysterectomy demonstrates superior outcomes, including shorter surgery duration, reduced costs, faster recovery, and fewer complications. These findings underscore the need to prioritize vaginal hysterectomy training and adoption in LMICs where feasible.

Keywords

Abdominal Hysterectomy, Vaginal Hysterectomy, Comparative Study, Sub-Saharan Africa, Douala General Hospital

1. Introduction

Hysterectomy, the surgical removal of the uterus, with or without the cervix and adnexa, is one of the most frequently performed gynecological procedures worldwide [1]. Common indications include uterine fibroids, abnormal uterine bleeding, endometriosis, uterine prolapse, and gynecological malignancies. The procedure can be classified into total (removal of uterus and cervix), subtotal (removal of the uterine body, leaving the cervix), and radical (removal of uterus, cervix, surrounding tissues, and lymph nodes) [2]. Surgical approaches include abdominal, vaginal, laparoscopic, and laparoscopy-assisted vaginal hysterectomy (LAVH) [3].

Vaginal hysterectomy has a long history, predating the abdominal approach, and was traditionally favored for conditions like uterine prolapse [4]. Compared to abdominal hysterectomy, the vaginal route offers several advantages, including smaller incisions, reduced postoperative pain, shorter hospital stays, and faster recovery, making it a preferred option when feasible [2] [3]. Despite these benefits, its adoption remains inconsistent, particularly in low- and middle-income countries (LMICs), where abdominal hysterectomy continues to dominate [5].

In Sub-Saharan Africa, including Cameroon, hysterectomy trends reflect broader healthcare challenges. A study in Nigeria found that abdominal hysterectomy accounted for 82% of cases, with vaginal hysterectomy performed in only 12%, primarily due to surgeon preferences, lack of training, the prevalence of large polymyomatous uteri or other pelvic conditions that may make vaginal access difficult [2] [5].

In Cameroon, despite the availability of all three surgical approaches (abdominal, vaginal, and laparoscopic) [6], abdominal hysterectomy remains the most commonly performed procedure, even at tertiary care facilities like the Douala General Hospital [2] [5] [7]. This predominance may not always align with best practice

guidelines, particularly when considering the potential advantages of the vaginal route.

This study aimed to compare abdominal and vaginal hysterectomy in terms of perioperative and postoperative morbidity, cost, and recovery time at the Douala General Hospital. Understanding the relative benefits and drawbacks of each approach in our specific context is crucial for optimizing patient care. By comparing these two surgical routes, we hope to provide evidence to inform clinical decision-making, promote the appropriate use of vaginal hysterectomy when indicated, and ultimately improve the quality of gynecological surgical care at our institution and potentially other similar settings.

2. Materials and Methods

2.1. Study Design, Period, and Setting

This was a retrospective, analytical, cross-sectional study conducted over a five-year period, from January 1, 2019, to December 31, 2023, in the Gynecology-Obstetrics Department of Douala General Hospital (DGH). DGH is a tertiary referral center located in Cameroon, renowned for delivering high-quality healthcare and for its active role in training medical professionals. The hospital's obstetrics and gynecology units are staffed with specialized personnel and equipped to perform hysterectomies via all three major surgical routes: abdominal, vaginal, and laparoscopic.

2.2. Inclusion and Exclusion Criteria

The study included all patients who underwent either elective or emergency hysterectomy (abdominal or vaginal) during the study period, provided their records were complete. Inclusion required the availability of full preoperative, intraoperative, and postoperative data, including surgical indications, complications, and follow-up outcomes. Histopathological confirmation was mandatory for suspected malignancies.

Exclusion criteria were:

- Incomplete surgical records with more than 5% missing key variables (e.g., operative time, complications, or follow-up data).
- Cases involving concurrent major pelvic surgeries (e.g., radical hysterectomy, pelvic exenteration).
- Patients lost to follow-up before their first postoperative visit.

2.3. Data Collection and Variables

Data were collected using a structured, pre-tested form developed based on literature review and expert input. The tool underwent validation through:

- Pilot testing on 20 randomly selected cases (excluded from final analysis) to evaluate clarity and consistency.
- Inter-rater reliability testing, yielding a kappa coefficient of 0.78 between two independent data extractors.

Variables collected included:

- Sociodemographic data**:** age, occupation, marital status, level of education.
- Surgical details: indication for surgery, surgical approach (abdominal or vaginal), operative time, estimated blood loss, intraoperative complications.
- Postoperative outcomes: duration of hospital stay, infections, time to resume daily activities.
- Patient-reported outcomes**:** self-perceived recovery (categorized as good, moderate, or poor) and impact on sexual function (assessed using a 5-point Likert scale).

2.4. Data Collection Procedure

Data collection followed a multi-step process:

- Case Identification**:** Operating theater and admission registers were reviewed to identify all hysterectomy cases within the study period.
- Data Extraction: Two trained research assistants independently extracted data using the standardized form.
- Discrepancy Resolution: Any discrepancies between extractors were resolved by a third reviewer.
- Follow-up Interviews: For variables involving self-reported outcomes (e.g., sexual function), patients were contacted via structured telephone interviews after verbal consent was obtained.

2.5. Data Management and Analysis

Data were double-entered into Microsoft Excel to reduce input errors and subsequently exported to STATA version 13 for statistical analysis. The frequency of each hysterectomy type (abdominal, vaginal, laparoscopic) was calculated as a proportion of the total number of hysterectomies. Comparative analysis focused on abdominal versus vaginal hysterectomy.

Descriptive statistics: Quantitative variables were reported as means and standard deviations; categorical variables were reported as percentages.

Inferential statistics**:** Comparisons were made using Chi-square or Fisher's exact tests, with statistical significance defined at $p < 0.05$.

2.6. Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of the Faculty of Health Sciences, University of Buea. Administrative approval was also granted by the management of Douala General Hospital. Patient confidentiality was strictly maintained through data coding and anonymization. For patients contacted by phone, verbal informed consent was obtained before collecting self-reported information.

3. Results

A total of 270 hysterectomies were performed during the study period, but only

215 patient files were enrolled for this study; 21 files could not be traced, and 34 had missing data. The average age of the patients was (49.65 ± 8.63) years, with an average parity of 3.69 ± 1.31. The majority of patients (66.5%) were married, and 41.4% were housewives (Table 1).

Table 1. Sociodemographic characteristics of study participants.

Variable	Frequency (n = 215)	Percentage
Age group		
24 - 34	6	2.8
35 - 44	54	25.1
45 - 54	102	47.4
55 - 64	41	19.1
65 - 74	12	5.6
Marital status		
Married	143	66.5
Single	42	19.5
Widower	30	14.0
Occupation		
Housewives	89	41.4
Private sector	66	30.7
Self-employed	28	13.0
Public sector	20	9.3
Health workers	11	5.1
Students	1	0.5

3.1. Type of Hysterectomy

Abdominal hysterectomy was the most commonly performed procedure, accounting for 88.8% of cases, while vaginal hysterectomy made up only 11.2% (Figure 1).

3.2. Indications, Cost, and Duration of Hospital Stay for Each Type of Hysterectomy

As shown in Table 2, the primary indication for abdominal hysterectomy was uterine fibroids, which accounted for 55.5% of cases, while cervical dysplasia was the leading indication for vaginal hysterectomy, representing 41.7% of cases. The mean operative time for abdominal hysterectomy ((184 ± 26) minutes) was significantly longer compared to the vaginal approach ((136 ± 37) minutes). Additionally, the average cost of an abdominal hysterectomy (US$ 449) was higher than that of a vaginal hysterectomy (US$ 410). Postoperative hospital stay was longer for patients who underwent abdominal hysterectomy (6 days) compared to those who had a vaginal hysterectomy (3 days).

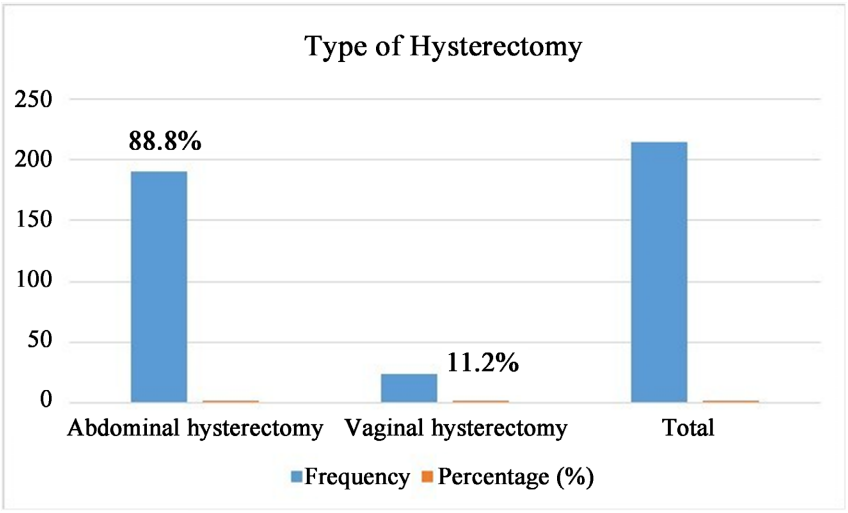

Figure 1. Distribution of participants according to type of hysterectomy.

Table 2. Distribution of indications for surgery, operative time, cost, and duration of hospital stay based on approach (abdominal vs. vaginal).

Category	Abdominal Approach	Vaginal Approach	p-value
Indications for Surgery			
Benign Conditions			
Uterine Fibroids/Myomas	106 (55.5%)	-	0.104
Uterine Prolapse	0 (0.0%)	6 (25.0%)	/
Adenomyosis	1 (0.5%)	-	/
Endometrial Hyperplasia	12 (6.3%)	-	/
Cancerous Conditions			
Cervical Dysplasia	32 (16.8%)	10 (41.7%)	**0.008**
Cervical Cancer	23 (12.0%)	-	/
Endometrial Cancer	12 (6.3%)	-	/
Choriocarcinoma	3 (1.6%)	-	/
Ovarian Cancer	6 (3.1%)	-	/
Operative Time			
Mean (minutes)	184	136	**0.012**
Minimum (minutes)	90	90	0.956
Maximum (minutes)	470	190	0.042
Standard Deviation (SD)	55.95	25.58	0.034
Cost of Surgery (US Dollars)			
Mean	449	410	0.036
Minimum	372	400	0.0234
Maximum	569	444	0.0581

Continued

Standard Deviation (SD)	45	18	0.043
Duration of Hospital Stay			
Mean (days)	6	3	0.024
Minimum (days)	5	3	0.052
Maximum (days)	24	5	0.007
Standard Deviation (SD)	1.9	0.45	0.037

3.3. Outcomes of Different Types of Hysterectomy

Table 3 below summarizes perioperative complications. Intraoperative hemorrhage, the most common complication (13.6%), occurred more frequently in the abdominal hysterectomy group (9.4%) than in the vaginal hysterectomy group (4.2%) (Table 2). Postoperative anemia was the most prevalent complication in both groups, occurring in 46.3% of abdominal hysterectomy patients and 20.8% of vaginal hysterectomy patients. However, no statistically significant difference was found in the overall postoperative complication rates between the two groups.

Table 3. Postoperative complications.

Complication	Abdominal (n = 239)	Vaginal (n = 31)	p-value
Anemia	88 (36.8%)	5 (16.1%)	0.012
Fever	19 (7.9%)	0 (0.0%)	0.045
Urinary Tract Infection*	21 (8.8%)	5 (16.1%)	0.155
Hemorrhage	9 (3.8%)	1 (3.2%)	0.812
Wound/Site Infection**	6 (2.5%)	0 (0.0%)	0.187
Other Complications***	26 (10.9%)	6 (19.4%)	0.125

*Includes cystitis and hematuria; **Includes operative site infection and subcutaneous hematoma; ***Includes transit disorder, vaginal pruritus, epigastralgia, flushing, dyspareunia, increase in blood pressure, and vaginal discharge.

3.4. Return to Duties and Psycho-Affective Outcomes

Patients who underwent vaginal hysterectomy were able to resume daily activities significantly sooner (<4 weeks) compared to those who underwent abdominal hysterectomy (>4 weeks) ($p = 0.007$) (Table 4). There were no significant differences between the two groups regarding quality of sexual life or self-perception.

4. Discussion

In our study, 88.8% of hysterectomies were performed via the abdominal route, while 11.2% were vaginal. This distribution mirrors previous findings from the same institution [7] and aligns with trends observed in other West African studies [8] [9]. However, some studies report a higher frequency of vaginal hysterectomy.

Table 4. Socio-psycho-affective outcomes after hysterectomy.

Outcome	Abdominal (n = 239)	Vaginal (n = 31)	p-value
Return to Daily Activities			
<4 weeks	42 (17.6%)	8 (25.8%)	**0.007**
≥4 weeks	197 (82.4%)	23 (74.2%)	
Dyspareunia	**/**	**/**	**0.322**
No	92 (38.5%)	13 (41.9%)	/
Yes	67 (28.0%)	5 (16.1%)	/
Return to Sexual Activity	/	/	0.156
No Return/Stopped	34 (14.2%)	8 (25.8%)	/
≤4 weeks	5 (2.1%)	0 (0.0%)	/
>4 weeks	152 (63.6%)	16 (51.6%)	/
Reduction in Frequency of Sexual Intercourse	/	/	0.303
No	123 (51.5%)	18 (58.1%)	/
Yes	68 (28.5%)	6 (19.4%)	/
Negative Self-Perception	/	/	0.104
No	128 (53.6%)	20 (64.5%)	/
Yes	63 (26.4%)	4 (12.9%)	/

Factors contributing to the low rate of vaginal hysterectomy at the DGH include the high prevalence of large, polymyomatous uteri, pelvic adhesions, and a limited number of surgeons skilled in the vaginal approach [2]. Practices in Cameroon, similar to many resource-constrained countries, have not fully embraced the recommendations of the International Society of Gynecologic Endoscopy (ISGE) or the trends seen in high-income countries, where vaginal hysterectomy is the preferred method for treating benign uterine conditions [4] [10].

The mean operative time in our study was 184 minutes for abdominal hysterectomy and 136 minutes for vaginal hysterectomy. In contrast, European countries and the USA, where these techniques have been practiced for several decades with high-quality equipment, report significantly shorter durations, averaging 45 minutes for the abdominal approach and 32 minutes for the vaginal approach [11]. Studies from low- and middle-income countries (LMICs) show varying operative times, such as 58.45 minutes for abdominal and 87.55 minutes for vaginal procedures, as reported by Divya N. Alamelu *et al.* in Nigeria [12] and 29.9 minutes for vaginal hysterectomy in South Africa [13]. Several factors contribute to the disparities in operative durations across regions, including differences in surgical experience, mental state of the surgeon, case complexity, patient preferences, and procedure costs [2]. In Cameroon, the frequent presentation of patients with large, multiple uterine myomas and the limited number of specialists proficient in vag-

inal surgery contribute to longer operative times.

Regarding cost, our study found that vaginal hysterectomy was less expensive than abdominal hysterectomy. Vaginal hysterectomy is consistently reported as the least costly method compared to abdominal, laparoscopic, or other types of hysterectomy in both high- and low-income countries. The cost-effectiveness of vaginal hysterectomy can be attributed to shorter hospital stays, fewer surgical materials used, and a reduced complication rate. Similar findings have been reported by authors studying the cost-effectiveness of hysterectomy for benign conditions in Africa [2] and high-income countries [14]-[16].

In terms of hospital stay, our study found an average length of 6 days for abdominal hysterectomy and 3 days for vaginal hysterectomy, consistent with the variation reported in the literature, which ranges from 5 to 9 days for abdominal hysterectomy and 1 to 5 days for vaginal hysterectomy in LMICs [17]-[19]. Several factors influence hospital stay post-hysterectomy, including the surgical route, patient-related factors (such as age and comorbidities), surgeon skill, aseptic techniques, and complications. In our setting, surgeons with moderate experience tend to extend hospital stays for patient safety. Other contributing factors include variations in postoperative care protocols and patient-specific conditions.

Uterine fibroids were the leading indication for abdominal hysterectomy (55.5%), while cervical dysplasia was the most common reason for vaginal hysterectomy (41.4%). In our setting, as in other LMICs, vaginal hysterectomy for a non-prolapsed uterus is restricted by certain criteria, including uterine size (less than 12 weeks), proof of benign disease, number of uterine fibroids, and history of previous laparotomy [12] [16]. However, other authors suggest that techniques such as myomectomy, bisection, and morcellation can overcome difficulties related to the size and number of fibroids, allowing vaginal hysterectomy to be performed regardless of uterine size [12] [13] [17].

Intraoperative and postoperative complications were more frequently observed in the abdominal hysterectomy group, a trend commonly reported worldwide. These complications include intraoperative bleeding, organ injury, and postoperative fever [18]-[20]. This can be attributed to the larger surgical field and the increased potential for blood loss and tissue trauma associated with the abdominal approach. Notably, no deaths were recorded in either group during the study, which is consistent with findings in other LMICs.

Regarding the impact on quality of life, most patients resumed sexual activity within one month after surgery, showing no change in sexual arousal compared to their preoperative state. There was no significant difference between vaginal and abdominal hysterectomy in terms of time to return to sexual activity ($p = 0.156$). While the effect of hysterectomy on sexual function remains controversial, with some studies reporting no significant change, others note improvements or declines in sexual activity [21]-[24]. Factors such as sexual arousal, dyspareunia, vaginal dryness, and overall sexual activity may be influenced to varying degrees, with some studies reporting marked improvements in sexual activity [25]. In our study,

postoperative dyspareunia rates were higher in the abdominal hysterectomy group (35.1%) compared to the vaginal group (20.8%), but this difference was not statistically significant (p = 0.322). These rates are higher than the 15% reported by Graesslin *et al.* [26], but lower than the 90% rate reported by other authors who did not differentiate between surgical approaches. About 20% of patients reported cessation of intercourse, citing reasons such as fear (14%), marital issues (4.65%), and misinformation (1%), with no significant differences between groups (p = 0.156). Additionally, a reduction in the frequency of sexual intercourse was reported by 35.6% of abdominal hysterectomy patients and 25% of vaginal hysterectomy patients (p = 0.303), which is lower than the 44% reported by Barrat *et al.* [27] and similar to findings by Graesslin *et al.* where 15% reported reduced sexual activity against 15% who reported increased activity [26].

5. Study Strengths and Limitations

While the retrospective design and limitations related to matching demographic characteristics and surgery indications may weaken the conclusions, this study provides valuable insight into the comparative outcomes of abdominal and vaginal hysterectomy. It offers a grounded foundation for future research that could incorporate more homogeneous patient groups, multi-center data, and longer follow-up periods to better evaluate the long-term effects of different hysterectomy techniques.

6. Conclusion

Abdominal hysterectomy remains the predominant approach at the DGH. However, this study underscores the advantages of vaginal hysterectomy, including shorter operative times, lower costs, and faster recovery. While early postoperative morbidity was slightly higher in the abdominal group, no significant differences were observed in overall complication rates. Although there were no significant differences in sexual function or self-perception between the two groups, trends suggest a potential negative impact, particularly after abdominal hysterectomy. These findings highlight the need to promote and expand the use of vaginal hysterectomy where clinically appropriate. Further research with larger sample sizes is needed to better understand the long-term effects of hysterectomy on quality of life and sexual function.

Authors' Contributions

RT, TNN, FMN, and NCT conceptualized and designed the study. ANS, FKM, and CJNN were responsible for recruiting participants at the study sites. AGSW and HN also contributed to participant recruitment and provided feedback on the manuscript. The manuscript was written by TNN, RT, TOE, and FMN. HE, GHE, and NCT critically revised and reviewed the manuscript for important intellectual content. All authors read and approved the final version of the manuscript.

Conflicts of Interest

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

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