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Feasibility of Sutureless Vaginal Hysterectomy in the Department of Obstetrics and Gynecology at Point G University Hospital from December 2016 to June 2022

Mamadou Sima[1*], Mamadou Salia Traoré[2], Ibrahim Ousmane Kanté[1], Mahamoud Mahamadou Koureichi[3], Abdoulaye Sissoko[4], Ahmadou Coulibaly[1], Seydou Fané[2], Aminata Kouma[5], Tiounkani Théra[1], Ibrahima Téguété[2], Yaya Ibrahim Coulibaly[3], Youssouf Traoré[2]

[1]Department of Gynecology and Obstetrics, Point G University Hospital, Bamako, Mali
[2]Department of Gynecology and Obstetrics, Gabriel Toure University Hospital, Bamako, Mali
[3]Infectious Diseases and Medical Entomology Research and Training Center, Bamako, Mali
[4]Department of Gynecology and Obstetrics, Mohamed VI Perinatal Hospital, Bamako, Mali
[5]Department of Gynecology and Obstetrics, Pr Bocar Sidy Sall University Hospital, Kati, Mali
Email: *drmsima@gmail.com

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Abstract

Introduction: Hysterectomy is one of the most frequently performed surgical procedures in the world. Sutureless vaginal hysterectomy has advantages, including its minimally invasive nature, better postoperative outcomes, and fewer associated complications. This study, therefore, aimed to assess the feasibility of sutureless vaginal hysterectomy at Point G University Hospital (CHU Point-G). **Materials and Methods:** This non-randomized comparative cohort description study included retrospective and prospective data collection on all vaginal hysterectomies (with or without sutures) performed for benign conditions between December 1, 2016, and June 30, 2022, at Point-G University Hospital. The sutureless procedure consisted of clamping the uterine attachments between two Jean Louis Faure clamps and then coagulating them with bipolar forceps. **Results:** Sutureless vaginal hysterectomy accounted for 0.38% of all surgical procedures and 9.13% of hysterectomies. The median age of the study population was 57.5 years (range, 35 to 78 years). The average duration of the procedure was 65 minutes (40 to 90 min) for the sutureless group and 69.3 minutes (45 to 95 min) for the sutured group. The length of hospital stay

for patients who underwent sutureless hysterectomy was 1.8 [±0.89] days, and that for the sutured group was 3 [±0.93] days ($p < 0.001$). The sutureless technique had a median procedure cost of 38,000 CFA francs, compared to 68,000 CFA francs for the suture method. No intraoperative or postoperative complications were reported in the group of patients who underwent sutureless hysterectomy. **Conclusion:** The results suggest that sutureless vaginal hysterectomy is less expensive and offers shorter operating times, reduced hospital stays, and fewer complications. It is therefore a feasible and effective technique that could serve as an alternative to the suture method.

Keywords

Vaginal Hysterectomy, Perioperative Complications, Sutureless Technique

1. Introduction

Hysterectomy, a surgical procedure that involves removing all or part of the uterus, is one of the most common operations in the world. In the United States, approximately 600,000 hysterectomies are performed yearly [1]. This procedure can be performed in different ways: abdominally, vaginally, laparoscopically, or robot-assisted [2] [3]. The choice of method often depends on several factors, such as the underlying medical reasons, the surgeon's preferences, and concerns related to patient safety and postoperative recovery. According to recent statistics in the United States, 66% of hysterectomies performed for benign conditions are still done abdominally, 22% vaginally, and 12% laparoscopically [4]. However, the abdominal approach is frequently associated with a higher rate of complications, such as infections, prolonged pain, and longer hospital stays [5].

In Africa, although vaginal hysterectomy has many advantages, it remains relatively uncommon. The abdominal approach remains the most common method for treating benign conditions, despite evidence suggesting that the vaginal approach may offer better outcomes in terms of morbidity and costs [6] [7]. This may be due to a lack of specialized training, concerns about the safety of the technique, and the reality of limited resources in many healthcare facilities [5].

In Mali, from 1995 to 2000, the frequency of vaginal hysterectomy was 27.3% at the Point G University Hospital [8]. Vaginal hysterectomy, on the other hand, has several notable advantages. It is less invasive, generally allows for faster recovery, and is associated with a reduced risk of postoperative complications such as infections and chronic pain [3] [6] [7]. In addition, renowned organizations such as the American Society of Gynecology and Obstetrics recommend this method as the most appropriate for benign uterine conditions [7] [9]. Economic studies, such as the one conducted by Kala *et al.* [10], have also shown that this technique is cost-effective due to reduced hospitalization and postop-

erative care costs.

The sutureless vaginal hysterectomy technique is attractive because it saves operating time. In addition, the reduced use of sutures and limited intraoperative traction appear to decrease postoperative pain [11].

In the Malian context, sutureless vaginal hysterectomy, although effective, remains underused, particularly in the Obstetrics and Gynecology Department of the Point G University Hospital. Although scientific data support its effectiveness in the treatment of benign uterine conditions [10], this technique has been performed by only one surgeon in the department to date. Generating data on the benefits of this approach, particularly in a resource-limited setting, could encourage more surgeons to adopt it.

The main objective of this study is to compare the feasibility of sutureless vaginal hysterectomy with that of the standard vaginal method, focusing on operating time, intraoperative and postoperative complications, and length of hospital stay. This research also aims to promote the use of less invasive and more effective surgical techniques, thereby contributing to better patient care while reducing the costs associated with treating these conditions. It could thus improve women's quality of life while optimizing the use of resources in healthcare facilities.

2. Materials and Methods

2.1. Type, Period, and Study Site

This was a non-randomized comparative cohort description study with data collection on all cases of vaginal hysterectomy performed for benign conditions between December 1, 2016, and June 30, 2022 (five years and six months), at the Point-G University Hospital Center (CHU).

All sutureless vaginal hysterectomies were performed by the same surgeon, while those requiring sutures were performed by several surgeons. All surgeons were gynecologists.

2.2. Description of the Procedure with Sutures

We will describe the part where the uterine attachments are cut between two clamps before being tied with 1 or 0 absorbable suture. Thereafter, the paracervix and uterosacral ligaments are cut and then tied with suture. The uterine arteries are then sectioned and tied with thread. The last ligaments, including the round ligaments and the utero-ovarian pedicles, are finally sectioned and tied with the thread [11].

2.3. Description of the Equipment and Sutureless Procedure

The European bipolar forceps with its cord is placed on the right side of the table, along with the instruments for vaginal surgery (**Figure 1**). Our sutureless procedure consisted of cutting the uterine attachments between two Jean Louis Faure forceps, then coagulating them with the European bipolar forceps (**Figures 2-5**). The vagina is closed with a suture using 0.0004 mm absorbable thread.

Figure 1. Surgical instruments for a sutureless hysterectomy, European bipolar forceps on the right of the image (photo source: Gynecology and Obstetrics Department, Point G University Hospital).

Figure 2. Coagulation with the European bipolar forceps of the straight ties (paracervix, uterosacral) after their sectioning (photo source: Gynecology and Obstetrics Department, Point G University Hospital).

Figure 3. Coagulation with the European bipolar forceps of the left attachments (paracervix, uterosacral) after their sectioning.

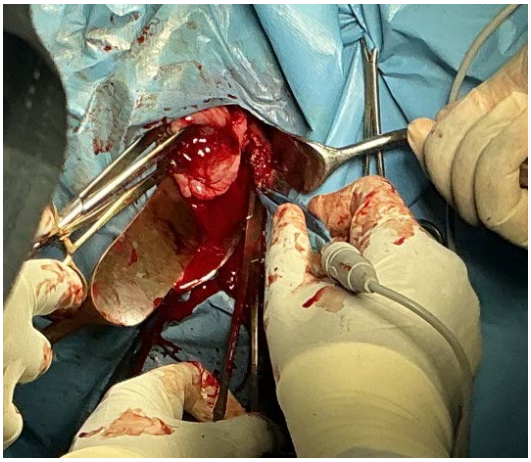

Figure 4. Coagulation of the left uterine-ovarian pedicle after its sectioning.

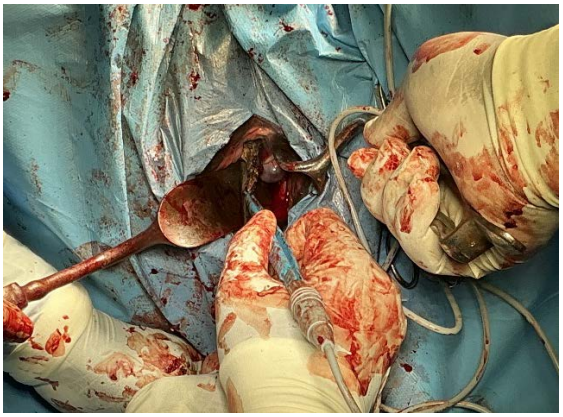

Figure 5. Coagulation of the right utero-ovarian pedicle after its sectioning.

2.4. Study Design

This is a non-randomized comparative cohort description study comparing two surgical techniques used to perform a vaginal hysterectomy: the suture method and the sutureless method.

The study was conducted in the Gynecology-Obstetrics Department of the Point University Hospital, where all patients who underwent a hysterectomy in the last 5 years were included, provided that the relevant information was available in the department's records.

Patients were classified into two groups according to the surgical technique used. The first group consisted of patients who underwent hysterectomy with the use of sutures (traditional technique). The second group of patients underwent hysterectomy without the use of sutures (sutureless technique).

Clinical data, including information on intraoperative and postoperative complications, as well as vital prognoses (in terms of postoperative mortality and morbidity), were collected from the medical records of the Gynecology-Obstetrics department. The study was conducted retrospectively and prospectively, analyzing the records of the patients concerned.

2.5. Study Population

The study population consisted of all patients who had undergone a hysterectomy in the Gynecology-Obstetrics Department of the Point-G University Hospital over the past five years. These patients were selected from the department's medical records, where information on surgical procedures, complications, and postoperative outcomes was recorded.

2.6. Sampling

The final sample consisted of all patients who met the inclusion criteria, with complete follow-up of intraoperative and postoperative complications, as well as information on their short-term prognosis.

2.7. Inclusion Criteria

Patients who had undergone a hysterectomy in the last 5 years in the Gynecology-Obstetrics Department of the Point G University Hospital and had complete data in the department's medical records, including the surgical technique used, complications encountered, and immediate prognosis after surgery.

2.8. Exclusion Criteria

Patients with complex medical histories or conditions that led to uncontrolled variations in the surgical process (e.g., surgery combined with other major pathologies unrelated to hysterectomy) were not included.

2.9. Variables under Study

The variables studied were sociodemographic characteristics, personal history, indications for surgery, type of anesthesia, type of procedure, duration of procedure and hospitalization, presence or absence of intraoperative or postoperative complications, and the cost of medications in the operating room.

2.10. Data Management and Analysis

Data analysis was performed using SPSS (Statistical Package for Social Sciences) version 21 software. Differences were considered statistically significant when the p-value was <0.05.

2.11. Ethical Considerations

Given the retrospective nature of the study and the fact that it used only the routine care data, hospital authorization, scientific and regulatory committee approval were sought and obtained. Individual informed consent was not obtained because only patient records were used, along with other materials that could provide information on the provided care. For confidentiality, the collected data were anonymized.

3. Results

We collected 20 cases of sutureless vaginal hysterectomy and 40 cases of vaginal

hysterectomy with sutures. Of the 5,235 surgical procedures, there were 219 hysterectomies (4.18%). Sutureless vaginal hysterectomies accounted for 0.38% of surgical procedures and 9.13% of hysterectomies during the study period (data not shown). The 60 cases selected for the current manuscript were the ones eligible with complete data in the department's medical records. They had clear details available on the surgical technique used, complications encountered, and immediate prognosis after surgery.

3.1. Sociodemographic Data

The median age of the study population was 57.5 years, ranging from 35 to 78 years. Most patients in both groups were over 50 years of age, with proportions of 60% and 75% (12/20 and 30/40), respectively, for the sutured and sutureless groups.

The proportion of patients who had not attended school was significantly higher in the group that underwent hysterectomy with sutures (65%) compared to those who underwent hysterectomy without sutures (40%); p = 0.023. The two groups were comparable in terms of age distribution (p = 0.388) (Table 1).

Table 1. Sociodemographic characteristics of patients in the two groups.

	Type of Hysterectomy		
Characteristics	**Sutureless** N = 20 **n (%)**	**Sutured** N = 40 **n (%)**	**p**
Age Groups			0.388
30 to 50	8 (40%)	10 (25%)	
51 to 70	11 (55%)	25	
71 to 90	1 (5%)	5	
Level of Education			**0.023**
Primary	2 (10%)	8 (20%)	
Secondary	4	4 (10%)	
Higher	6 (30%)	2 (5%)	
Not in School	8	26 (65%)	
Cost (FCFA)	38,000 [37,100 - 38,500]	68,000 [65,840 - 69,000]	**0.001**

3.2. Clinical Data

The distribution of patients according to BMI was significantly different between the group that underwent a sutureless hysterectomy (40%) and the group that underwent a sutured hysterectomy (10%), p = 0.040. The two groups were comparable in terms of the frequency of surgical history and parity (p > 0.325) (Table 2).

Table 2. Distribution of patients according to clinical characteristics.

	Type of Hysterectomy		
Characteristic	N = 20	N = 40	**p**
Surgical History			0.325
Prolapse Cure	0	3 (7.5%)	
Appendectomy	1 (5%)	1 (2.5%)	
Cesarean Section	1 (5%)	1 (2.5%)	
Cholecystectomy	0 (0%)	1 (2.5%)	
Ectopic Pregnancy	1 (5%)	0 (0%)	
Hemorrhoidectomy	1 (5%)	0 (0%)	
None	16 (80%)	34 (85%)	
Parity			0.679
Nulliparous	0	1 (2.5%)	
Primiparous	1 (5%)	0 (0%)	
Paucipara	10 (50%)	21 (52.5%)	
Multiparous	9 (45%)	18 (45%)	
BMI in kg/m²			**0.040**
<18.5	0	3 (7.5%)	
18.5 to 25	11	30	
26 to 30	8 (40%)	4 (10%)	
Over 30	1 (5%)	3 (7.5%)	

BMI: Body Mass Index.

The most frequently used type of anesthesia was spinal anesthesia (85% for the sutureless group and 97.5% for the sutured group). The average duration of the procedure was 65 minutes for the sutureless group and 69.3 minutes for the sutured group. The intraoperative and postoperative complications that occurred in the sutured group were hemorrhage in 2.5% of cases and ileus in 2.5% of cases (occurring on postoperative day 15) (Table 3).

Most patients in both groups had a length of stay between 1 and 3 days, with 95% and 77.5%, respectively. The average number of days of hospitalization was 1.8 days for patients who underwent hysterectomy without sutures and 3 days for those who underwent hysterectomy with sutures. This difference was greater than that expected by chance, $p < 0.001$ (Table 3).

The median direct cost for the procedure was 38,000 CFA francs (37,100 - 38,500) (approximately €57.84) for the sutureless technique and 68,000 CFA francs

(65,840 - 69,000) (approximately €102.69) for the suture-associated technique. This cost covers the surgical procedure (Table 1).

Table 3. Surgical characteristics of women treated in the two study groups.

Characteristics	Type of Hysterectomy		
	Sutureless N = 20	Sutured N = 40	p
Operating Indication			**0.006**
Adenomyosis	1 (5%)	0 (0%)	
Severe Dysplasia	7 (35%)	5 (12.5%)	
Uterine Fibroid	2 (10%)	3 (7.5%)	
Ovarian Cyst	1 (5%)	0	
Abnormal Uterine Bleeding	4 (20%)	4 (10%)	
3rd-Degree Genital Prolapse	5 (25%)	28 (70%)	
Type of Anesthesia			0.103
Spinal Anesthesia	17 (85%)	39 (97.5%)	
General Anesthesia	3 (15%)	1 (2.5%)	
Preservation of Adnexa			0.465
Yes	11 (55%)	18 (45%)	
No	9 (45%)	22 (55%)	
Operating Time (Minutes)	65 [40 - 90]	69.3 [45 - 95]	0.348
Operating Time			0.439
<1 hour	8 (40%)	12 (30%)	
≥1 hour	12 (60%)	28 (70%)	
Intraoperative Complications			>0.999
Hemorrhage	0 (0%)	1 (2.5%)	
None	20 (100%)	39 (97.5%)	
Postoperative Complications			>0.999
None	20 (100%)	39 (97.5%)	
Small Bowel Obstruction	0	1 (2.5%)	
Length of Hospital Stay (Days)	1.8 [1 - 4]	3 [1 - 6]	**< 0.001**
Length of Hospital Stay (Categories)			0.142
1 - 3 days	19 (95%)	31 (77.5%)	
4 - 6 days	1	9 (22.5%)	
Mean [Min - Max]			

4. Discussion

This study aimed to compare the feasibility and results of sutureless vaginal hysterectomy with the sutured hysterectomy technique in a resource-limited setting, specifically at the Point G University Hospital in Mali. The results showed that sutureless vaginal hysterectomy is a viable technique that is effective and has fewer complications compared to the traditional suture-based method. The average operating time was slightly shorter for the sutureless technique (65 minutes) than for the sutured one (69.3 minutes), suggesting that the sutureless approach could allow for a faster procedure, which is crucial in resource-limited settings.

In addition, the length of hospital stay was significantly shorter for patients who underwent sutureless hysterectomy, with an average stay of 1.8 days compared to 3 days for the traditional method group ($p < 0.001$). This is consistent with previous studies reporting shorter recovery times and fewer complications with minimally invasive techniques [12]. These improvements were not reported by the review paper by Pergialiotis *et al*. in 2014 and the study of Levy *et al*. in 2003, who reported only less blood loss for the sutureless method [13] [14]. This difference is due to the fact that these clinical studies were conducted using different designs and methods, making the findings heterogeneous [13] and hard to compare.

In addition, the cost-effectiveness of the sutureless technique, with a median procedure direct cost of 38,000 CFA francs, compared to 68,000 CFA francs for the traditional method, highlights its potential for wider application in resource-limited healthcare settings. Reduced cost associated with the sutureless technique could improve access to care in a context where budget constraints are common, and insurance coverage is rare [10].

Despite promising results, the study also had limitations, including the relatively small sample size and the retrospective nature of data collection, which could introduce bias. The fact that the sutureless technique was performed by a single surgeon, while the suture technique involved several surgeons, could also influence the results due to higher inter-operator variability in this group than in the first. In addition, the lack of follow-up limited the assessment of long-term complications, such as chronic pain or sexual consequences, which may differ between the two methods.

Some indicators may have acted as confounding variables due to the lack of balance in their frequencies between the sutureless and the sutured groups. These were the BMI normal range frequency, the hysterectomy indications frequency, and the fact that all the sutureless surgeries were done by a single physician. The unequal distribution may modify the findings, urging the recommendation of additional studies with better control over possible confounding factors. Nevertheless, the study provides critical information on the feasibility of sutureless vaginal hysterectomy and its advantages over the traditional method, particularly in settings where resources and surgical expertise are limited.

5. Conclusion

Sutureless vaginal hysterectomy is a feasible and effective technique in the context

of the Point G University Hospital and could serve as an alternative to the traditional method with suture. The results suggest that it offers shorter hospital stays, making it a cost-effective option in resource-limited settings. Prospective studies with larger samples and long-term follow-up are needed to confirm these results and evaluate the long-term benefits of sutureless vaginal hysterectomy in improving patient outcomes and optimizing healthcare resources.

Conflicts of Interest

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

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