

Gynaecological Pan-endoscopy (Hystero-laparoscopy) in a tertiary health facility in Nigeria: A Ten-Year clinical audit

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Abstract

Objective: This study aims to determine the prevalence, indications, common findings, challenges, and complications of gynaecological pan-endoscopy in Obafemi Awolowo University Teaching Hospitals Complex, Osun State.

Methods: It was a retrospective study. Records of patients who had gynaecological hysteroscopy and (or) Laparoscopy from 1st January 2012 to 31st December 2021 were retrieved, and relevant data were extracted and analyzed using the SPSS version 21.0

Results: There were 2125 gynaecological surgeries within the study period, with 207 endoscopies giving a prevalence of 9.7%. Infertility 100 (51.5%) was the most common indication. Common findings were tubal block 45(33.6%) and intrauterine adhesions 19 (31.7%). The most common complication and challenge were shoulder tip pain 35(18.0%) and instrument failure 76 (39.2%), respectively. There is a statistically significant relationship between the occurrence of complications during Endoscopy and duration of surgery ($X^2=25.693$, $P=0.000$), endoscopy type ($X^2=21.636$, $P=0.000$), and hospital stay ($X^2=63.213$, $P=0.000$)

Conclusion: The utilization rate of gynaecological pan-endoscopy could be higher and shows more skills, logistics, and staffing. Therefore, efforts should be intensified towards training and provision of up-to-date facilities for endoscopic surgery in our setting.

Keywords: Gynaecological pan-endoscopy, indications, challenges, complications

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Received: January 12, 2023

Accepted: May 14, 2023

Published: September 30, 2023

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<http://dx.doi.org/10.4314/rejhs.v11i3.1>

Pan-endoscopie gynécologique (hystéro-laparoscopie) dans un établissement de santé tertiaire au Nigéria: un diagnostic clinique de dix ans

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Résumé

Objectif de l'étude: Cette étude vise à déterminer la prévalence, les indications, les résultats communs, les défis et les complications de la pan-endoscopie gynécologique dans l'hôpital universitaire, Obafemi Awolowo dans l'État d'Osun.

Méthode de l'étude : Il s'agissait d'une étude rétrospective. Les dossiers des patients qui ont subi une hystérocopie gynécologique et (ou) une laparoscopie du 1er janvier 2012 au 31 décembre 2021 ont été récupérés, et les données pertinentes ont été extraites et analysées à l'aide de la version SPSS 21.0

Résultat de l'étude : Il y a eu 2125 chirurgies gynécologiques au cours de la période d'étude, avec 207 endoscopies donnant une prévalence de 9.7%. L'infertilité 100 (51.5%) était l'indication la plus fréquente. Les résultats communs étaient le bloc tubaire 45 (33.6 %) et les adhérences intra-utérines 19 (31.7 %). La complication et le défi les plus courants étaient la douleur à la pointe de l'épaule 35 (18.0 %) et la défaillance de l'instrument 76 (39.2 %), respectivement. Il existe une relation statistiquement significative entre la survenue de complications au cours de l'endoscopie et la durée de la chirurgie ($X^2 = 25.693$, $P = 0.000$), le type d'endoscopie ($X^2 = 21.636$ $P = 0,000$) et le séjour à l'hôpital ($X^2 = 63.213$, $P = 0.000$).

Conclusion : Le taux d'utilisation de la pan-endoscopie gynécologique pourrait être plus élevé et montre plus de compétences, de logistique et de personnel. Par conséquent, les efforts doivent être intensifiés vers la formation et la fourniture d'installations à jour pour la chirurgie endoscopique dans notre milieu.

Mots-clés : Pan-endoscopie gynécologique, indications, enjeux, complications

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INTRODUCTION

The primary concerns of modern-day gynaecological practice are cosmetics and improved quality of life. These have revolutionized modern gynaecology resulting in an increased quest for gynecological Endoscopy. As a result, the practice of gynecological pan-endoscopy (hysteroscopy and Laparoscopy) is at its peak in developed countries. However, it is still at a low level of development and performance in most developing countries, where the major health challenge is coping with mortality and morbidity following preventable causes (1, 2).

Endoscopy is a minimally invasive procedure and entails the examination of the interior of a canal or hollow viscus with a specialized instrument called an endoscope (1). Gynaecological Laparoscopy is a trans-peritoneal endoscopic technique that provides excellent visualization of the pelvic structures and often permits the diagnosis of gynaecologic disorders and pelvic surgery without laparotomy (2). It is one of the most common surgical procedures performed by gynaecologists and the most important investigative tool for evaluating tubal disease in developed countries (2-7). Approximately 80% of all gynaecological surgical procedures can be laparoscopically (2).

Although more invasive than HSG, the Laparoscopy and dye test is the gold standard for evaluating tuboperitoneal factors in infertility. Its disadvantages, however, include the requirement for skill and equipment, the invasive nature, and the inability to assess the uterine cavity. As a result, Laparoscopy and dye tests are limited in evaluating infertility in Nigeria (8-10). To accommodate and take care of the inability of laparoscopy and dye test to evaluate the uterine cavity, hysteroscopy done at the time of Laparoscopy, and dye test was introduced in a procedure termed hystero-laparoscopy or pan-endoscopy. This approach is very useful and superior to either laparoscopy and dye test alone or HSG in evaluating and managing infertility (11-15).

The frequency of hystero- Laparoscopy varies widely across the globe. For example, in the USA, approximately 350,000 tubal ligations and 200,000 laparoscopically-assisted vaginal hysterectomies are carried out annually (1, 2), while in the United Kingdom (UK), about 250,000 gynaecologic laparoscopic surgeries are done annually (5). On the other hand, in developing countries, particularly in sub-Saharan Africa, gynaecological pan-endoscopy,

introduced in the 1970s through collaboration with donor agencies, is still evolving and is mainly diagnostic (6).

The indications for Laparoscopy are either diagnostic or therapeutic (2). Some of the diagnostic indications are pelvic pain, infertility, pelvic masses, genital tract anomalies, pelvic injuries, endometriosis, and pelvic inflammatory disease, while the therapeutic indications include tubal sterilization, adhesiolysis, missing intrauterine device, unruptured ectopic pregnancy, myomectomy, ova collection in IVF, ovarian drilling for polycystic ovaries, oophorectomy, hysterectomy and reconstructive surgery for pelvic organ prolapse (1, 2, 7).

The contraindications for Laparoscopy may be absolute or relative. The absolute contraindications are intestinal obstruction, generalized peritonitis, and intra-peritoneal bleeding, while the relative contraindications include severe cardiac or pulmonary disease, previous periumbilical surgery, shock, and cancer involving the anterior abdominal wall (2, 8). Other relative contraindications are morbid obesity, advanced intrauterine pregnancy, presence of a large mass, inflammatory bowel disease, and known severe peritoneal adhesions (1).

Despite the widespread utilization of Laparoscopy, there are limitations to its use in developing countries, including a lack of equipment and skilled personnel, increased cost, increased duration of surgery, and unstable power supply (6).

The complications of Laparoscopy are significantly lower than conventional surgery though some may not be recognized during the procedure and are mainly entry related (10). The reported rates of these complications are 1.0-12.5/1,000, 3.6/1,000, 5.7/1,000, and 12-15/1000 in the UK, Finland, the Netherlands, and Nigeria, respectively (5, 11). Major laparoscopic procedures are associated with a higher rate of complications (0.6%-18%) compared with minor procedures (0.06%-7.0%) (12)

The experiences and challenges of Endoscopy differ from one hospital to another, and these differences are dependent on the commitment of the governing bodies or boards of the hospital and that of the endoscopic surgeons as well as whether the hospital is solely a private establishment, public-private partnership, or exclusively government owned and operated hospital.

Thus, this study aimed to determine the prevalence, indications, common findings, and

complications and showcase the challenges of gynaecological pan-endoscopy in Obafemi Awolowo University Teaching Hospitals Complex, Osun State.

MATERIALS AND METHODS

This is a 10-year retrospective descriptive study of all gynaecological endoscopies performed at Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Osun State, from 1st January 2012 to 31st December 2021. The hospital is a major federal government-owned tertiary health facility and is an accredited center for postgraduate residency training in obstetrics and gynecology.

Information was obtained from patient's case notes, gynaecological ward registers, gynaecological clinic records, and theatre records. Cases with incomplete or missing data were excluded. In addition, data relating to age, parity, indications, procedure, findings, complications, and duration of hospital stay were extracted.

The socio-economic status of the women was stratified into classes 1 to 5 using the socio-economic stratification method by Olusanya et al. (17). This system scored the woman's educational status from zero [0] to two [2] and scored the husband's job description from one [1] to three [3]. Women with tertiary education scored zero, while primary or no formal education scored two. Husbands who are professionals (e.g., Lawyers, Engineers, Medical doctors, and so on) scored one, while those who engaged in unskilled labor (e.g., Artisans) scored three. Adding the husband's and wife's scores will give the socio-economic class of the woman. In this study, classes 1 and 2 were grouped as upper social class, class 3 as middle social class, while classes 4 and 5 were grouped as the lower social class to aid data analysis.

We analyzed the data using the SPSS for Windows version 20.0. Ethical approval for the study was from the Hospital Ethics Committee.

RESULTS

There were 2125 gynaecological surgeries within the study period, with 207 endoscopies giving a utilization rate of 97 per 1000 surgeries. Only 197 case files were available for review making a 95.2% retrieval rate. Three cases were excluded because of missing data. The remaining 194 cases were included in the final evaluation. Of these, there were 97 laparoscopies only, 60 hysteroscopies only, and 37 combined hystero-laparoscopies.

The age of the patients ranged between 19 and 52 years, with a mean age of 29.7 (± 3.5) years. Most of the procedures, 127 (65.5%), were carried out among the age group 29-38 years. Most of the patients, 115 (59.3%), belong to the lower social class, while almost all of them, 175 (90.2%), were married. They were predominantly Christians, 122 (62.9%), and 129 (66.5%) of Yoruba ethnicity, as shown in Table 1.

Of the 194 cases of Endoscopy under review, infertility 100 (51.5%) was the most common indication, followed by secondary amenorrhoea 44 (22.7%). Other indications include chronic pelvic pain, abnormal uterine bleeding, suspected ectopic pregnancy, and missing intrauterine devices, as shown in Figure 1,

Intraoperative findings in 134 patients who had Laparoscopy include bilateral tubal blockage 45(33.6%), polycystic ovaries 22 (16.4%), and 7 (5.2%) had bilateral hydrosalpinx. In addition, of the 97 hysteroscopy cases, 31 (32.0%) had intrauterine adhesions, while impacted fetal bones were found in 18(18.6%), as shown in Table 2.

Of the 194 cases, the procedures performed include diagnostic Laparoscopy in 65 (33.5%), diagnostic hysteroscopy in 30 (15.5%), laparoscopic ovarian drilling in 18 (9.3%), and hysteroscopic adhesiolysis in 18 (9.3%) patients as shown in Table 3.

The common complications identified were shoulder tip pain in 35 (18.0%) and surgical emphysema in 14 (7.3%). Others include abdominal pain, vomiting, and a case of uterine perforation. In addition, some challenges encountered include instrument failure 76 (39.2%) from poor maintenance, erratic power supply 100 (51.5%), and lack of vital equipment. The mean duration of the endoscopy procedure was 60.2 (± 3.7) minutes, while the mean duration of hospital stay was 35.5 (± 2.5) hours, as shown in Table 4.

There is a statistically significant relationship between the occurrence of complications during Endoscopy and duration of surgery ($X^2 = 25.693$, $P = 0.000$), endoscopy type ($X^2 = 21.636$, $P = 0.000$), and hospital stay ($X^2 = 63.213$, $p = 0.000$) as shown in Table 5

DISCUSSION

The introduction of gynaecological pan-endoscopy has revolutionized gynaecology practice leading to improvement in the quality of life of patients. These procedures are already well established in the developed world. However,

endoscopy procedures are still evolving in developing nations, mainly sub-Saharan African countries (1). However, our study confirmed the feasibility of these procedures in our settings amidst various challenges and limitations.

The utilization rate of minimal access gynaecological endoscopy in our study is low. This is similar to the finding of a previous study by Shehu and Bilal in Sokoto, Nigeria, where only 8.8% of the gynaecological surgeries were endoscopies (10) but lower than 34.8 reported by Parkar et al. among 17 rural hospitals in Kenya (18). Also, our rate is much lower than the range of 56.7-78.2% reported from studies in the developed world (1, 2, 5). The lack of sufficient exposure, failure of equipment, and the difficult learning curve associated with these procedures reported in local studies may explain the lower rate of endoscopic procedures in our settings (10).

The mean age of 29.7 (± 2.5) years is similar to what was reported in previous studies (10, 15) but lower than 49 (± 5.7) reported by Zand et al. from the United States (19). This may be because infertility, the most common indication for these procedures in our settings, is prevalent among this age group. Similarly, most of them had low parity presenting for fertility treatment, as seen in the previous survey (10, 15).

Most of this study's patients belong to the lower social class. Previous studies reported similar results (10-12). For example, Akande et al. (13) reported that more than half (59.9%) of their study population belonged to a lower social class. This is contrary to the report of Sarkar et al. from New Delhi, India, where most patients belong to the upper-middle class (20). Infertility is the most common indication for seeking gynaecological consultation and pan-endoscopy in Nigeria (1-3). It is usually associated with immense psychosocial challenges because of the high premium placed on childbirth. Unfortunately, the high cost of pan-endoscopy, the gold standard for evaluating tubal factor infertility, will worsen the financial burden of infertility treatment for this group of patients.

All the procedures in this study were carried out under general anesthesia, as was similarly reported from Abuja (19). Carbon dioxide gas was used to create pneumoperitoneum in all the patients. Room air can also be used safely with minimal complications, especially in low-resource settings like ours (22-24). Although cheaper and readily available, room air is associated with poorer visibility, increased risk of wound infection, and abdominal discomfort compared

with Carbon dioxide (25-27). Other gases that can be used are Nitrous oxide, Helium, and Xenon (21). Nitrous oxide gas has the added advantage of providing analgesia, especially in day-case Laparoscopy (22). These gasses were not used because they were not available in our environment.

In this study, diagnostic Endoscopy was the most common procedure performed. This is unsurprising since infertility was this center's most common indication for diagnostic hystero-laparoscopy. This finding is in contrast with what is obtained in the developed world. In their survey, Zand et al. (19) reported that 70% of endoscopy procedures were operative. Only 3.0% had a conversion to laparotomy, similar to the 7% report by Golash (24) but in contrast to 0.7% and 1.96% in Kano and Kenya, respectively (15, 16). The common pathologic finding at Laparoscopy and hysteroscopy were bilateral tubal blockage and intrauterine adhesions. This is similar to the results from Sokoto and Kano (10, 15).

Most of the patients had no complications, while among those that had complications, shoulder tip pain and surgical emphysema were the most common complications, followed by abdominal pain and anaesthetic complications. This is contrary to bladder and bowel injury found in a study in Kenya (16). Other complications could be anesthetic complications, ureteric and vessel injuries, and post-operative wound infections (18). No mortality was recorded in this study.

Gynaecological minimal access procedures still rely on advanced technology using more sophisticated instruments, as equipment malfunctions account for approximately one-third of the challenges encountered in the operating room in our study. The erratic power supply was experienced in more than half of the procedures. These challenges led to the conversion of five cases to laparotomy. Many studies from the third world, like ours, reported similar challenges (27-30). About two-thirds of the patients were discharged within 48 hours after surgery. This is similar to the study from Kenya, where 64.5% spent one night after the procedure (16). This is a significant advantage of pan-endoscopy over open surgery.

This study confirmed a significant association between complications and prolonged hospital stay post-operatively. Major complications will prevent immediate recovery and eventual return to normal activities leading to extra days in the hospital. Occasionally, intra-operative complications may force the surgeons

to convert to open surgery, further increasing the hospital stay duration. This fact has been confirmed in previous studies (3,10,11). The type of endoscopy procedures and duration of surgery also have a significant relationship to the occurrence of complications in our study. There is a reduction in the duration of surgery from hysteron-laparoscopy followed by Laparoscopy only, and lastly, hysteroscopy only with the shortest duration. Prolonged Carbon-dioxide insufflations during Laparoscopy can increase the risk of complications such as shoulder-tip pain, gas embolism, and cardio-pulmonary insufficiency. Evidence abounds to corroborate the impact of prolonged duration of endoscopic surgeries on the development of complications either intra-operative or post-operative (3,7,11-13).

CONCLUSION

Our study established the feasibility and safety of gynaecological pan-endoscopy in our settings despite the various challenges encountered. However, the utilization rate of gynaecological pan-endoscopy is low and shows limited skills, logistics, and human resources. Therefore, efforts should be intensified towards training and provision of up-to-date facilities for endoscopic surgery in our setting.

Conflict of interest: All the authors declare that there is no conflict of interest

Financial support and sponsorship: Nil

Acknowledgments: We acknowledged the valuable contribution of our mentor, Dr. BadejokoOlalekan, who trained us in Endoscopy and guided us in writing this manuscript.

Authors Contributions: FAO, OSO, and LOM participated in the conception and design of the study and the definition of intellectual content. In addition, FAO, OSO, AMS, AOE, and AJA participated in the literature search, data acquisition, data analysis, drafting, editing, and manuscript review for sound intellectual content. All the authors approved the final version of the manuscript. All authors also agreed to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Table 1: Socio-demographic Characteristics of the Patients

Variables	Frequency (n=194)	Percentage (%)
Age (years)		
19-28	23	11.9
29-38	127	65.5
39-48	30	15.5
=49	14	7.1
Marital Status		
Married	175	90.2
Single	19	
Educational Status		
No formal education	67	34.5
Primary	46	23.7
Secondary	45	23.2
Tertiary	36	18.6
Parity		
0	155	79.9
1-2	25	12.9
=3	14	7.2
Social Class		
Upper	45	23.2
Middle	34	17.5
Lower	115	59.3
Ethnicity		
Yoruba	129	66.5
Hausa	31	16.0
Igbo	34	17.5

Table 2: Operative findings during gynaecological Endoscopy

Variables	Frequency	Percentage (%)
Laparoscopy findings*		
(n=134)		
Patent tube (bilateral)	45	33.6
Patent tube (unilateral)	15	11.2
Bilateral tubal blockage	35	26.1
Unilateral tubal blockage	15	11.2
Unilateral hydrosalpinx	12	9.0
Bilateral hydrosalpinx	07	5.2
Massive adhesions	18	13.4
Ovarian cysts	19	14.2
Polycystic ovary disease	23	17.2
Violin string appearance	22	16.4
Hysteroscopy findings*		
(n=97)		
Normal uterine cavity	22	22.7
Blocked ostia	19	19.6
Blocked ostium	12	12.4
Endometrial polyp	10	10.3
Uterine adhesions	31	32.0
IUCD localized	09	9.3
Impacted fetal bones	18	18.6
Submucous fibroid	05	5.2

*Multiple entries allowed

Table 3: Procedures, methods of primary entry, duration of operation, and duration of hospitalization of the patients

Variables	Frequency	Percentage (%)
Procedures (n=194)		
Laparoscopy and dye test	65	33.5
Diagnostic hysteroscopy	30	15.5
Hysteroscopic adhesiolysis	18	9.3
Hysteroscopic IUCD retrieval	12	6.2
Laparoscopic adhesiolysis	10	5.2
Ovarian drilling	18	9.3
Salpingectomy	15	7.7
Cystectomy	14	7.2
Myomectomy	05	2.6
Total laparoscopic hysterectomy	04	2.1
Laparoscopic-assisted vaginal hysterectomy	03	1.5
Primary entry technique at Laparoscopy (n=134)		
Verres needle insertion	120	89.6
Direct trocar insertion	10	7.5
Hansen technique	04	2.9

Table 4: The complications and challenges encountered, the duration of the procedures, and hospital stay

Variables	Frequency	Percentage (%)
Duration of operation (minutes) (n=194)		
0-60	95	49.0
61-120	56	28.9
121-180	23	11.9
>180	20	10.3
Mean (\pm SD) 60.2 (\pm 3.7)		
Duration of hospital stay (hours) (n=194)		
0-24	30	15.5
25-48	105	54.1
49-72	45	23.2
>72	14	7.2
Mean (\pm SD) 35.5 (\pm 2.5)		
Complications (n=194)		
None	116	59.8
Anesthetic complications	05	2.6
Difficult insufflation	08	4.1
Vomiting	15	7.7
Shoulder tip pain	35	18.1
Emphysema	14	7.2
Uterine perforation	01	0.5
Challenges encountered* (n=194)		
None	45	23.3
Instrument failure	76	39.2
Power interruption	100	51.5

*Multiple entries allowed

Table 5: Association between selected characteristics and occurrence of complications during Endoscopy

Variables (n=194)	Complications		Statistical indices	P values
	Yes (n=78)	No (n=116)		
Surgery duration (in minutes)				
=60	17(20.0)	68 (80.0)	df=1, X ² = 25.693	P= 0.000
>60	61 (56.0)	48 (44.0)		
Duration of Hospital stay (in Hours)				
=35	10 (10.5)	85 (89.5)	df=1, X ² = 63.213	p=0.000
>35	68 (68.7)	31 (31.3)		
Endoscopy type				
Laparoscopy only (97)	46 (47.4)	51(52.6)	df=2, X ² =21.636	P=0.000
Hysteroscopy only (60)	10 (16.7)	50 (83.3)		
Hysterolaparoscopy (37)	22 (59.5)	15 (40.5)		
Patients' age				
=30	38 (42.2)	52 (57.8)	df=1, X ² =0.294	p=0.594
>30	40 (38.5)	64 (61.5)		
Social Class				
Upper	13 (29.9)	32 (71.1)	df=2, X ² = 1.95	p=0.051
Middle	20 (58.8)	14(41.2)		
Lower	45(39.1)	70(60.9)		

≤

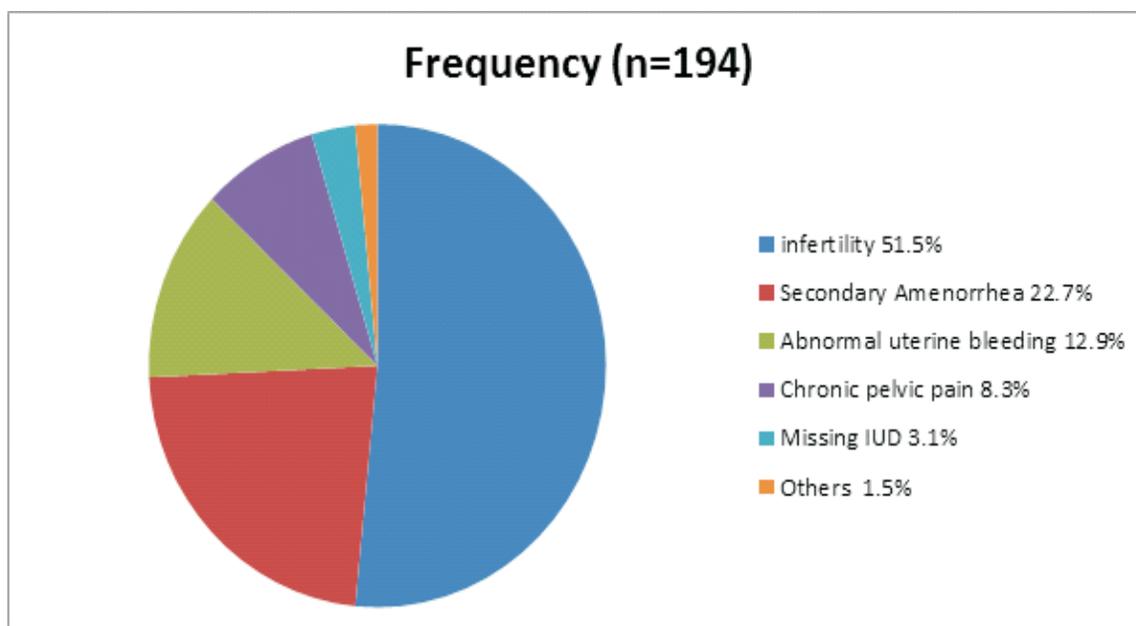


Figure 1: Indications for Gynecological Endoscopy