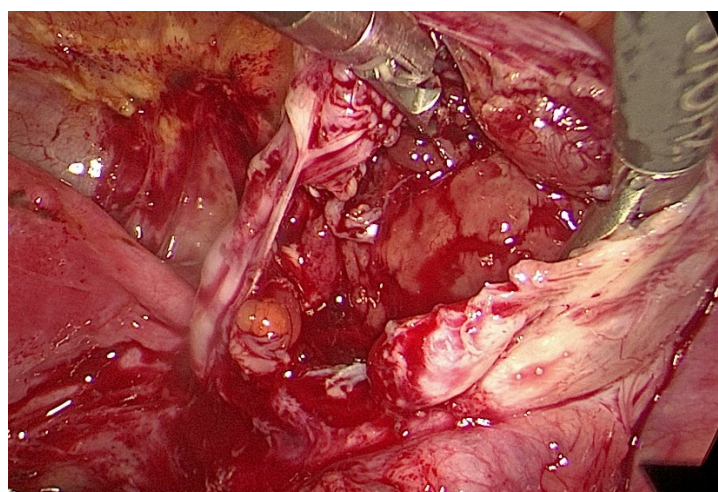
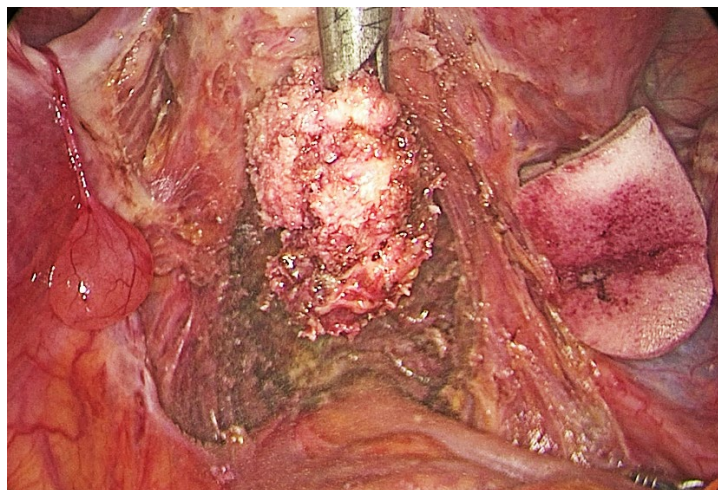




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For billions of people, there is hardly any medical care available. This is particularly difficult in remote areas of the world. Can modern information technology and artificial intelligence help in the future?

Artificial intelligence (AI) holds significant promise for transforming medicine in developing countries by improving healthcare access, diagnosis accuracy, treatment efficacy, and resource allocation. Some options AI could impact medicine in developing countries:

For example, by remote Healthcare Delivery, AI-powered telemedicine platforms can provide access to healthcare services in remote areas where medical resources are scarce. Patients can receive consultations and diagnoses from healthcare professionals without the need for travel. To provide diagnostic Support, AI algorithms can assist healthcare providers in diagnosing diseases more accurately and quickly, even in areas with a shortage of skilled medical professionals. This can lead to earlier detection and treatment of illnesses, ultimately improving patient outcomes. In Public Health Management AI can analyse large datasets to identify disease outbreaks, track epidemiological trends, and predict future health crises. This information enables more effective public health interventions and resource allocation. In the field of drug discovery and development AI algorithms can accelerate the drug discovery process by analysing vast amounts of biological data and identifying potential drug candidates more efficiently. This could lead to the development of new treatments for diseases prevalent in developing countries. The latter especially with regard to cost reduction. Still there is a problem with health education and awareness. Probably AI-powered chatbots and virtual assistants can provide healthcare information and guidance to individuals, promoting preventive care and healthy behaviours in communities with limited access to healthcare resources.

Surgeons themselves can hardly be replaced, as robotic systems in particular are extremely expensive and cannot be maintained or cared for in remote areas. However, AI systems could help with the post-operative care of patients or the detection of complications.


However, it's important to address challenges such as data privacy, infrastructure limitations, and regulatory hurdles to ensure equitable access to AI-powered healthcare solutions in developing countries. Additionally, efforts should be made to ensure that AI technologies are culturally and contextually appropriate for diverse populations. On the way, however, it is still imperative to train medical staff in nursing and with doctors in order to allow more people to participate in medical aid.

The latter remains the most important goal of ISGE, to which numerous doctors are committed and support ISGE as trainers. They provide teaching materials and travel to courses around the globe. Be part of this community.

Best wishes

G. Noé

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The frontpage shows:

large Endometriosis of the Septum and a fresh opened ovarian Endometrioma

Hysteroscopic findings in patients presenting with abnormal uterine bleeding in a Congolese population of Kinshasa

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Abstract

Introduction

Abnormal uterine bleeding is a real public health issue. The distribution of its causes varies from one setting to another. Hysteroscopy, which is the gold standard for structural causes of Abnormal uterine bleeding is not always accessible to our population and no local hysteroscopic data are available. The aim of this study was to determine the symptoms associated with hysteroscopic findings in a Congolese population in Kinshasa presenting with Abnormal uterine bleeding.

Methodology

This was a retrospective case series on 151 records of patients who underwent consecutive office hysteroscopy carried out by a single operator for Abnormal uterine bleeding between January 2018 and December 2022 in a private clinic in Kinshasa. Sociodemographic, clinical and hysteroscopic variables were retained. Descriptive statistics were used and comparison of proportions was made using Pearson's Chi-square or Fisher's Exact test. The test was significant at a p value less than 0.05.

Result

The mean age of patients was 37.53±10.89 years old. They were nulliparous at approximately 51% and the non-menopausal women represented 89.40%. Heavy menstrual bleeding less or equal to 8 days was the most frequent complaint (54.31%). The most common findings were endometrial polyps at 30.36%, uterine myomas at 23.81%, and adenomyosis at 8.93%. In 11.90% of cases, patients had no abnormality found on hysteroscopy. Heavy menstrual

bleeding less or equal to 8 days and Heavy menstrual bleeding more than 8 days were symptoms associated with the discovery of myomas (respectively $p = 0.011$; $OR = 11.66$ and $p = 0.000$; $OR = 91.00$).

Conclusion

Endometrial polyps and uterine myomas are the most common structural causes of Abnormal uterine bleeding in our environment. This heavy bleeding mostly affects women aged 35 and over. Heavy menstrual bleeding less or equal to 8 days and Heavy menstrual bleeding more than 8 days are symptoms associated with myomas.

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Key words: Abnormal uterine bleeding, hysteroscopy.

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Introduction

Abnormal uterine bleeding (AUB), particularly excessive bleeding represents a major concern for patients throughout their lives, and therefore a public health issue [1]. Up to 30% of women will seek for help from a medical practitioner to counter this problem during their reproductive age [2]. It causes considerable health care burden on women, their families and society as a whole [3].

AUB significantly and negatively affects quality of life [4], and can have a negative economic impact due to the absenteeism in the workplace [5]. This bleeding can also be the result of serious pathologies such as endometrial cancer [6].

According to the FIGO Menstrual Disorders Working Group, the causes of AUB are summarized in the acronym PALM [Polyps-Adenomyosis-Leiomyomas-Malignancy] for structural causes and COEIN [Coagulopathy-Ovulatory dysfunctions-Endometrial causes-Iatrogenic causes-No otherwise classified] for non-structural causes [7].

Guin et al. [8] in 2011, in a study conducted in India, reported that in 30% of cases, endometrial hyperplasia was the most common hysteroscopic finding underlying AUB. While in China, in 2018, Sun et al. [9] found that endometrial polyps were the most

common intrauterine condition in case of AUB, representing 16.2% of cases.

In Canada, Beaumont et al. [10] in 2000, found no abnormality on hysteroscopy in 76% of women with AUB while the pathological findings were dominated by endometrial polyps in 7% of cases. In Kenya, in 2020, Mutakha et al. [11] noted that uterine myomas were the most common intrauterine cause underlying AUB in 44.5% of cases.

The analysis of this great variability in the structural causes of AUB depending on the environment therefore prohibits the extrapolation of data from one environment to another. The research question was about the most common findings on hysteroscopy in Congolese women presenting with AUB. Considering the lack of local hysteroscopic studies in our setting, informations about local causes underlying structural AUB will help in developing management strategies, especially since in low-income countries, hysteroscopy, which is the gold standard for intrauterine pathologies, is not always accessible to most of women. It therefore seemed imperative to investigate the probability of different hysteroscopic findings in particular types of AUB in our environment. This was the aim of the present study. The objectives were to describe the sociodemographic and clinical characteristics of women with AUB, to

describe hysteroscopic findings, and to identify symptoms associated with these hysteroscopic findings.

Material and methods

This was a retrospective case series of 151 records of patients who underwent consecutive hysteroscopies for AUB in an outpatient Clinic. They were received at Clinique d'Or in Kinshasa/Democratic Republic of Congo, from January the 1st, 2018 to December the 31st, 2022. All hysteroscopies were carried out by a single operator.

The variables retained were as follows: age, level of education, marital status, parity, gestational age, history of abortion/miscarriage, type of abortion/miscarriage, menopausal status, type of bleeding, history of uterine surgery, type of surgery and hysteroscopic findings.

As a routine, before carrying out the hysteroscopy, explanations on the procedure, the possibility of performing certain procedures and the possible complications are provided to the patient. The procedure is routinely carried out without premedication and without anesthesia with psychological support provided by the team in the hysteroscopy room and particularly by the nurse.

Patients are placed in the gynecological position and procedures are performed using

a 5 mm external diameter Bettocchi hysteroscope with a 2.9 mm 30-degree scope.

The uterine cavity is distended with 0.9% saline solution. Intrauterine pressure is obtained by gravity if visibility is satisfactory or by pressure on a soft infusion bag using a pneumatic chamber with a pressure gauge.

Data were entered with EPI DATA 3.1 and then analyzed with SPSS (Statistical Package for Social Sciences) 23.0 software.

The qualitative variables were displayed as proportions and the quantitative ones in mean and standard deviation or median and extreme depending on the case.

Comparison of proportions between groups was made using Pearson's Chi-square or Fisher's Exact test when appropriate. The Odds Ratio was used to measure the strength of association between variables.

The test was significant for a p value less than 0.05.

The present study obtained an approval from the Ethics Committee of the Kinshasa School of Public Health (ESP/CE/134/2022).

Results

The mean age of patients was 37.53 ± 10.89 years old. More than a half was married (56.95%) and more than three quarters (80.80%) had a university level. The majority was nulliparous (51%) while almost a quarter

(24.50%) was multiparous. Patients who had never achieved a pregnancy represented 31.79% while those who had experienced at least one abortion represented 51%. Premenopausal patients constituted more than three quarters (89.40%) of the present study. In terms of surgical history, 25.83% of patients had a uterine surgery. More than a half (54%) of these patients had undergone a myomectomy while cesarean section represented 44%. HMB \leq 8d was the most reported AUB (54.31%), followed by intermenstrual bleeding (IMB) (23.84%). (Table 1). Endometrial polyps and myomas were the most frequently encountered pathologies in hysteroscopy, with 30.36% and 23.81% respectively. Adenocarcinoma was found in 2.38% of cases. In the presence of AUB, up to 11.90% of patients did not present any abnormality on hysteroscopy. (Table 2).

Regarding the factors associated with polyps as hysteroscopic findings, Table 3 shows that there was no difference in the finding of polyps in patients based on age, nulliparity, nulligestity and the type of bleeding. (p respectively of 0.410; 0.776; 0.363; 0.084 and 0.202).

Compared to women under 34 years old, those from 35 to 44 years old had 4 times the risk of having myomas (OR = 3.6; 95% CI 1.03 – 13.10) in hysteroscopy when presenting with AUB. Considering the type of

bleeding, patients presenting with HMB $>$ 8d, had 91 times more risk of having myomas compared to those who had HMB \leq 8d (OR = 91.00; 95% CI 4.90 – 1687.48). This risk was 12 times when taking in account HMB \leq 8d (OR = 11.66; 95% CI 1.27 – 106.79). Nulliparity and nulligestity were not associated with the finding of myomas (p-value of 0.898 and 0.480 respectively). (Table 4).

Discussion

In the present study, the mean age of patients was 37.53 ± 10.89 years old. This finding is in agreement with those made in China and Canada by Sun et al. [9] and Beaumont et al. [10] (respectively 35.9 and 34.3 years). This age is therefore within the range of those advanced in the literature, very close to the pre-menopausal period [12,13]. Indeed, menstrual disorders constitute one of the most frequent complaints among women in perimenopausal period. The latter integrates into its definition several parameters including those linked to age, physiological and biological changes and also symptomatology [14].

With regard to age, certain pathologies which are responsible for AUB, in particular polyps and uterine myomas, have a symptomatology which peaks between the thirties and the forties due to the disturbances in the

functioning of the hypothalamic-pituitary-ovarian axis, frequent during this period [14].

Regarding reproductive characteristics, nulliparous women represented 51% in the present study. This proportion is close to that found by Ghimire et al. [15] which was 61%. However, it differs from the larger proportions of multiparous women reported by Pandey et al. [16], Kashyap et al. [17] and Vijayan et al. [18].

Indeed, in the present study and in that conducted by Ghimire et al. [15], polyps and myomas were the most frequent hysteroscopic findings associated with AUB. Several studies report the existence of an inverse association between parity and the occurrence of myomas and polyps, suggesting a protective effect of multiparity. Myomas and polyps are twice as common in nulliparous women compared to others [19,20]. These myomas can lead to AUB by increasing the endometrial surface area associated with weakening and engorgement of vessels [21], and by supplanting platelet action due to the increase in vascular flow in the areas presenting lesions [22]. In addition, polyps and myomas can be responsible for female infertility, which could explain the preponderance of nulliparity. Several pathophysiological mechanisms have been put forward, in particular by proximal tubal occlusion, modification of gamete transport,

deformation of the uterine cavity, abnormal contractility with modification of endometrial vascularization and finally the reduction of endometrial receptivity. This reduction is consecutive to an alteration of the implantation mechanisms by inflammatory phenomena and a reduction in the level of Homeobox (Hox) of the HOXA-10 and HOXA-11 type [23-27].

The discrepancy of the data of the present study compared to those of Pandey et al. [16], Kashyap et al. [17] and Vijayan et al. [18] is probably due to the fact that the presence of these structural anomalies does not necessarily have an impact on a woman's fertility because many of them conceive and give birth with myomas and polyps [27].

Regarding the type of AUB, HMB \leq 8d was the most reported complaint. This finding is similar to those noted by Vijayan et al. [17] and Radhikabai et al. [28] who reported frequencies of 76.1% and 31.25% respectively.

The finding of the present study is in agreement with the literature data which places HMB \leq 8d in first position as the most reported complaint in case of AUB [29]. Several studies report polyps and myomas as the most common structural pathologies in cases of AUB [28,30]. These can lead to AUB, particularly HMB through mechanisms previously mentioned.

In this study, endometrial polyps were the most common finding at approximately 30.36% and patients presented indifferently with HMB \leq 8d, IMB and HMB $>$ 8d. This proportion is similar to those found by Lasmar et al. [31], Malik et al. [32] and Ghimire et al. [15] which were respectively 33.9%; 30% and 46.67%. It diverges from those noted by Kaur et al. [33] and Guin et al. [8] who reported endometrial hyperplasia as the most common finding in 30% of cases. In these last two studies, most of patients were multiparous. These studies, mainly carried out in India, a country with a high population density [34] where laws on birth control are restrictive. This could justify the use of contraceptive methods, including estrogen therapy that is not or only minimally counterbalanced [35] being a risk factor underlying endometrial hyperplasia. But also, the high prevalence of obesity and metabolic syndrome in India [36] could explain this high frequency of endometrial hyperplasia, due to the aromatization in adipose tissue of delta-4 Androstenedione and testosterone into estrone and estradiol respectively [37-38].

Myomas represented the second most common pathology in approximately 24%. This proportion is close to that of 29 % found by Kumari et al. [39] whose study focused on peri-menopausal women who had AUB. A longitudinal study estimated that the risk of

developing fibroids in a woman over 45 years of age is greater than 60% with a higher incidence during peri-menopause [19]. Indeed, in the present study, 60% of the patients were aged at least 35 years. A similar observation was also observed by Kumari et al. [39] who reported a proportion of approximately 66% of women aged from 40 to 45 years in the perimenopausal period. The essential characteristic of these patients is reflected by a dysfunction of the hypothalamic-pituitary-ovarian axis leading to a climate of relative hyperestrogenism [40].

It has been clearly recognized for several years the role of hormones (estrogens and progesterone) in the occurrence of myomas [41]. In fact, estrogens have a well-accepted mitotic effect, mediated largely by growth factors and by autocrine and paracrine regulation. Estradiol (E2) experimentally stimulates the growth of uterine smooth muscle cells [41]. Although plasma estradiol levels are not necessarily high, we recognize the essential role of a local hyper estrogenic environment (higher concentrations of E2, estrone and their sulfates). It results from metabolic abnormalities, such as reduced conversion of E2 to estrone, and higher concentrations of cytochrome P450 (aromatase) [41].

Endometrial cancer was found in 2.38% of cases in the present study. This proportion

seems to be close to the lifetime risk of presenting endometrial cancer, which is approximately 2.6% [42], and diverges from those found by Giannella et al. [43] and Saccardi et al. [44].

In fact, the frequency of 2.38% reported in this study is high compared to 1.3% found by Giannella et al. [43]. It represents approximately one tenth (21%) of that reported by Saccardi et al. [44]. This may be due to the fact that, in the present study, approximately 11% of patients were postmenopausal and endometrial biopsy was only done when there were macroscopically suspicious lesions. Giannella et al. working on the prediction of endometrial hyperplasia and cancer in pre-menopausal women with AUB had excluded postmenopausal women, who are at greatest risk of developing endometrial cancers [45-46]. On the other hand, the study by Saccardi et al. [44] which focused on predicting the risk of endometrial cancer based on the indication for diagnostic hysteroscopy was carried out on women in peri-menopause or menopause with a systematic endometrial biopsy, which could maximize the probability of finding cases of endometrial cancer.

Limitations of the study

The present study borders on having been a documentary retrospective. Therefore, it did not cover all possible variables in patients

with. Anamnestic elements leading, for example, to non-structural causes could not be identified while a significant fraction of patients with AUB had no structural lesion on hysteroscopy. The non-systematic performance of histopathology and the lack of information about the economic level of the patients are others limitations linked to the retrospective nature of the present study.

Conclusion

In this study, endometrial polyps and myomas were the most common findings at hysteroscopy in the presence of AUB. HMB $\leq 8d$ and HMB $> 8d$ which are the main manifestations, are associated symptoms in the discovery of polyps and myomas in women aged 35 and over. Thus, for our environment where hysteroscopy is not accessible to many patients, in any case of AUB, we must raise polyps and myomas as the first hypotheses and systematically search them using ultrasound which is an available tool.

Conflict of interest

The authors declare that they have no conflict of interest.

Author contributions

- Mindombe Moleko Patrick: participation in design, statistical analyzes and writing

- Lumingu Lusakueno Armand: participation in the design
- Biawila Lusila Bruno: participation in the design
- Kusuman Amos: participation in design and writing
- Odimba Mpoy Jules: participation in the design
- Kintoki Makundika Olivier: participation in the design
- Ndesanzim Otem Christian: participation in the design
- Nzau-Ngoma Emmanuel: research design, statistical analysis and validation of the final version of the manuscript.

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Tables and figure:

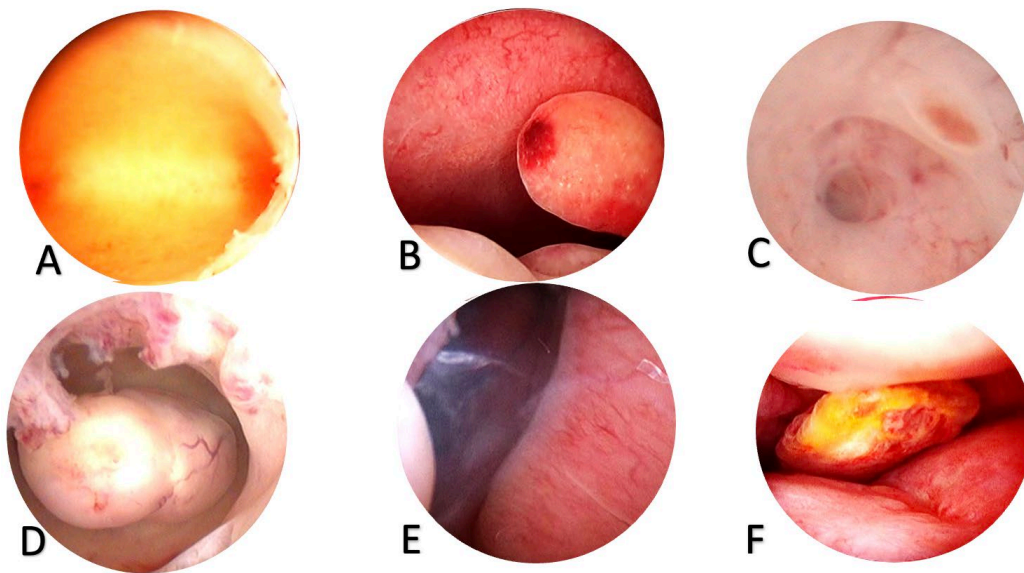


Figure 1. Findings in hysteroscopy

A. Negative hysteroscopic view, B. Endometrial polyps, C. Adenomyosis (we see a nest and a hole leading into the depth of the myometrium, D. Uterine myoma, E. Hypertrophy of the endometrium with a polypoid appearance of the endometrium, F. Adenocarcinoma of the endometrium (we have a polypoid mass with an area of necrosis).

Table 1: Sociodemographic and clinical characteristics of women with AUB

Variables	Numbers (n=151)	Percentage	Median (min, max)	Mean ± SD
Age (y.o)				37,53±10,89
< 25	17	11,26		
25-34	43	28,48		
35-44	55	36,42		
≥ 45	36	23,84		
Marital status				
Single	60	39,74		
Divorced	1	0,66		
Maried	86	56,95		
Widow	4	2,65		
Level of education				
Primary school	2	1,32		
High school	27	17,88		
Academic	122	80,80		
Parity			0 (0, 7)	
0	77	51,00		
1 - 2	37	24,50		
≥ 3	37	24,50		
Gesity			2 (0, 9)	
0	48	31,79		
1 - 2	49	32,45		
≥ 3	54	35,76		
Abortion			1 (0, 6)	
0	74	49,00		
1	41	27,15		
≥ 2	36	23,85		
Post menopausal				
No	135	89,40		
Yes	16	10,60		
H/o Uterine surgery				
Non	112	74,17		
Oui	39	25,83		
Type of surgery				
C- Section	17	43,59		
Myomectomy	21	53,85		
Polypectomy	1	2,56		
Type of bleeding				
HMB >8d	33	21,85		
HMB ≤8d	82	54,31		
IMB	36	23,84		

Table 2: Diagnosis made at hysteroscopy in patients with AUB

Discoveries at hysteroscopy	Numbers	Percentage
Adenocarcinoma	4	2.38
Adenomyosis	15	8.93
Endometrial atrophy	11	6.55
Chronic endometritis	4	2.38
Endometrial hypertrophy	12	7.14
Isthmocele	10	5.95
Myoma	40	23.81
Endometrial polyp	51	30.36
Endocervical polyp	1	0.60
Normal	20	11.90
Total	168	100

Table 3: Association between Polyps and some variables

Variables	n	Polyps		raw gold	CI 95%	p-value
		No*	Yes			
Age (y.o)	68					0.410
≤ 34	-	13 (33.3%)	26(66.7%)			
≥ 35	-	7 (24.1%)	22 (75.9%)			
Nulliparity	68					0.776
No	-	8 (27.6%)	21 (72.4%)			
Yes	-	12 (30.8%)	27 (69.2%)			
Nulligestity	68					0.363
No	-	11 (25.6%)	32 (74.4%)			
Yes	-	9 (36.0%)	16 (64.0%)			
Type of bleeding	68					
IMB	-	7 (46.7%)	8 (53.3%)	1		
HMB >8d	-	1 (9.1%)	10 (90.9%)	8.75	0.884 - 86.603	0.084**
HMB ≤8d	-	12 (28.6%)	30 (71.4%)	2.18	0.649- 7.375	0.202

(*) Women who had a normal hysteroscopy (**) Fisher's Exact Test

Table 4: Association between myomas and some variables

Variables	n	Myomas		raw gold	CI 95%	p-value
		No*	Yes			
Age (y.o)	54					
≤ 34	-	13 (52.0%)	12 (48.0%)	1		
35-44	-	5 (27.7%)	17(77.3%)	3.6	1.03 - 13.10	0.039
≥ 45	-	2 (28.6%)	5(71.4%)	2.7	0.44 - 16.68	0.402**
Nulliparity	54					0.898
No	-	8 (38.1%)	13 (61.9%)			
Yes	-	12 (36.4%)	21 (63.6%)			
Nulligestity	54					0.480
No	-	11(33.3%)	22 (66.7%)			
Yes	-	9 (42.9%)	12 (57.1%)			
Type of bleeding	54					
IMB	-	7 (87.5%)	1 (12.5%)	1		
HMB >8d	-	1 (7.1%)	13 (92.9%)	91.00	4.90 - 1687.48	0.000**
HMB ≤8d	-	12 (37.5%)	20 (62.5%)	11.66	1.27 - 106.79	0.011

(*) Women who had a normal hysteroscopy

(**) Fisher's Exact Test

What is vNOTES hysterectomy and why it is important.

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Abstract

There are two ways to remove the uterus - through the abdominal wall or through the vagina. Each hysterectomy technique is simply a modification of these two. The benefits of vaginal hysterectomy are well known, but the frequency of vaginal hysterectomies has dropped drastically since the development of laparoscopic hysterectomies. The vNOTES – Transvaginal Natural Orifice Transluminal Endoscopic Surgery – technique is constantly being developed to increase the number of patients treated vaginally. In addition, the vNOTES technique is reviving the popularity of simple vaginal hysterectomies because they share some similar surgical steps. Studies have shown that vNOTES hysterectomies have several advantages over all other hysterectomy methods. Both vaginal and vNOTES hysterectomy should be (re)introduced into the practice of every minimally invasive gynecological surgeon and offered as a first choice for all eligible patients.

Key words: vNOTES, laparoscopy, vaginal, hysterectomy, single incision

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Introduction

There are two ways to remove the uterus - through the abdominal wall or through the vagina. Each hysterectomy technique is simply a modification of these two. The benefits of vaginal hysterectomy are well known, but the number of vaginal hysterectomies has dropped drastically since the development of laparoscopic hysterectomies. [1]

For all abdominal hysterectomies, the surgeon must make at least one scar on the abdominal wall. This is completely avoidable in vaginal surgery. Vaginal hysterectomy is a very original minimally invasive gynecological operation and a very original single-incision hysterectomy. Despite this, it has not gained fame as minimally invasive surgery, but rather as something old-fashioned and inferior. Several studies have shown that after vaginal hysterectomy there is less need for analgesia, less postoperative pain, shorter hospital stay, faster recovery, fewer postoperative febrile episodes, and a faster return to daily activities.[1] So why have we lost our passion and skills to perform this technique?

One problem may be that training in vaginal hysterectomy is deficient early in a surgeon's career. During residency, the total number of hysterectomy cases per surgeon has remained the same. The goal of developing

laparoscopic hysterectomy skills has led to a decrease in the number of open abdominal, but unfortunately also vaginal hysterectomy cases. [2]

Another problem may be that vaginal surgery is more challenging in difficult situations. The challenge comes from working in a narrower space compared to abdominal surgeries, and there are issues with visibility and access. To overcome these challenges, laparoscopic instruments such as manipulators, multifunctional instruments, and cameras, as well as dissection rules and surgical steps, have been developed. However, considering the benefit to the patient, our main goal should have been to develop operations towards the vaginal route, not the other way around.

Now vNOTES – Transvaginal Natural Orifice Transluminal Endoscopic Surgery – aims to achieve this goal by combining the advantages of vaginal and laparoscopic surgery. vNOTES operations are constantly being developed to increase the number of patients treated vaginally. In addition, the vNOTES technique is reviving the popularity of simple vaginal hysterectomies because they share some similar surgical steps.

vNOTES operations have developed rapidly in Europe and are increasingly being implemented around the world. Transvaginal

NOTES hysterectomy has become a significant competitor to all other hysterectomy methods. This article discusses the vNOTES hysterectomy technique, indications, contraindications, complications, and learning curve based on research findings.

Terms and abbreviations

The abbreviation NOTES stands for Natural Orifice Transluminal Endoscopic Surgery. NOTES operations are classified by anatomical organ of entry: vNOTES - transvaginal, gNOTES - transgastric, aNOTES - transanal, uNOTES - transurethral.[3]

Vaginal NOTES hysterectomy (VNH) can be done in several ways. VANH is a vaginally assisted NOTES hysterectomy, the surgical technique is described below. TVNH - total transvaginal NOTES hysterectomy means that the entire operation is performed laparoscopically through the vagina. Robotic assisted vaginal hysterectomy (RVANH) and robotic total transvaginal hysterectomy (RTVNH) are technically the same surgery, only performed by a robot.[4][5][6]

Patient selection

vNOTES hysterectomy can be offered to a wide range of patients whenever hysterectomy is indicated.

A non-prolapsed uterus is not a contraindication for vaginal hysterectomy or vNOTES hysterectomy.[7][8] Kaya et al compared TLH (total laparoscopic hysterectomy) with vNOTES hysterectomy for undescended large uteri and found that the vNOTES hysterectomy group had significantly shorter operative time (45 vs 160 min), hospital stay (48 vs 72 hours) and a lower 24-hour pain score (VAS 2 vs. 3).[9]

There are several studies where vNOTES is successfully performed on large uteri. X. Wang et al reported about 39 cases with a mean uterine weight of 1141.8 grams (1000-1720 g), operative time 123.3 minutes (40-400 minutes), estimated blood loss 206.7 mL (10-1300 mL), postoperative pain score 2.1 (0-5) and mean length of stay 2.4 nights (1-11). There was one urethral injury and three conversions to single-port laparoscopy.[10] Another study by Nulens et al examined 114 cases with a mean uterine weight of 559 ± 425 g (281–3361 g) with a success rate of 99%. The mean surgical time was 63 ± 34 minutes and was positively related to uterine size. They reported three cases of bleeding, one minor late complication, one laparotomy for specimen extraction, and no conversion to laparoscopy.[11]

Obesity is also not a contraindication to vNOTES surgery and may even be the preferred method of hysterectomy for this patient population. Kaya et al conducted a

study comparing TLH and vNOTES hysterectomy in 83 obese women with a mean BMI (body mass index) of 31.6 kg/m² and 31.9 kg/m² in the study groups, respectively. They found a shorter operative time (67.5 vs 136 min), a shorter postoperative hospital stays, and a lower mean postoperative pain score in the vNOTES group. [12] There is one study of 103 morbidly obese women in 2023 by Burnett et al., in which vNOTES surgery was successfully performed in 96 patients. [13]

vNOTES hysterectomy can be offered to nulliparous patients if the vaginal size is suitable for vaginal surgery. Expert vNOTES surgeons have concluded that nulliparity is not a contraindication to vNOTES surgeries.[6] In a 2021 study by Nulens et al., they had 31% nulliparous patients.[11]

vNOTES hysterectomy is the preferred minimally invasive hysterectomy technique for patients who have previously had a laparotomy because most adhesions are usually located away from the primary vNOTES entry site. It is recommended to rule out cul-de-sac adhesions during preoperative ultrasound examination, as rectovaginal endometriosis is a contraindication for this technique.[6]

Previous caesarean scar adhesions can be safely divided using certain surgical techniques. Identifying the bladder border is the first step in preventing bladder injury.

Traction to the uterus and mild countertraction to the bladder retractor helps to keep the bladder out of the operating field and increases the distance of the ureters from the uterus.[14] In difficult situations filling bladder with small amount of methylene blue or leaving in some urine may help. Also, uterine sound through urethra can be useful to identify the borders of the bladder. [15] A sharp dissection of the uterovesical fold is preferred and the scissor points must be tilted towards the uterus. [14] The lateral window technique has been described in several studies and can be performed in the vaginal or laparoscopic part of vNOTES surgery. [15][16]

The vNOTES technique is increasingly being used for several other benign indications, such as adnexal surgery [17], myomectomy [18], isthmocele repair [19] and prolapse. [20][21][22] There are several reports of successful vNOTES emergency surgeries such as ectopic pregnancy and adnexal torsion.[23] There is also growing interest in offering vNOTES surgeries for malignant indications such as endometrial and cervical cancer. [5][24][25][26][27]

Contraindications for vNOTES surgeries are mainly related to the access of abdominal cavity. The primary entry site for vNOTES surgeries is posterior vaginal fornix and cavum Douglas. Diseases like rectovaginal endometriosis, PID and surgeries that create

adhesions in primary entry site are contraindication to this technique. An extremely narrow vagina due to radiation therapy or virginity may create unreasonable obstacles to the safe performance of vNOTES.[6]

Surgical technique.

Both vaginal and laparoscopic instruments are required to perform vNOTES operations. [6] This surgery is usually performed under general anesthesia in lithotomy position, but spinal anesthesia has also been attempted. [28][6] Special multiple dose antibiotic regimen is recommended. [29]

vNOTES hysterectomy surgical steps are divided into three phases: A: vaginal; B: laparoscopic; C: vaginal. In Phase A the surgical theater is assembled according to usual vaginal surgery. Circumcision of the cervical mucosa, posterior and anterior colpotomy is performed, followed by division of the sacrouterine ligaments. A wound retractor and a silicone or self-made glove cup are then inserted to preserve the pneumoperitoneum. Patient is tilted into 20° Trendelenburg and laparoscopic part of the surgery is performed. As uterus is normally free from the anterior and posterior surfaces, this part of the operation is focused on separating the sides of the uterine body from the pelvic sidewall and adnexa. In phase C, extraction of specimen and closure of vagina is performed in vaginal setting. [6][29]

The biggest advantage of vNOTES hysterectomy for the surgeon is that the blood supply to the uterus is secured first. Regardless of how big and bulky the uterus is, the cervix is more or less the same size in all patients. At the beginning of the laparoscopic phase, there is direct access to the uterine vessels before any other step is performed. In conventional laparoscopy, the sequence is reversed. During any hysterectomy procedure, especially with a large uterus, the risk of bleeding remains high until the uterine vessels are closed. The vNOTES technique provides a huge advantage in reducing this risk.[30]

Not to mention the cosmetic result, because no visible scars remain on the abdominal wall after vNOTES surgery. Patient satisfaction with laparoscopic trocar site scars is influenced by several factors: larger size, umbilical position, emergency surgery, accidental trocar exit, fascia closure, and specimen extraction site - all of which are entirely avoidable in vNOTES operations. [31]

Several studies have been conducted on robotic vNOTES operations, confirming that this surgery can also be done with several different robotic platforms. [32][33][34][35][36][37][38][39]

Complications

Baekelandt et al published in 2021 a paper about complications of 1000 cases of vNOTES hysterectomies (73%), adnexal surgeries (18%) and salpingectomies (4%). The conversion rate was 0.4%, three cases to conventional laparoscopy and one to laparotomy. The intraoperative complication rate was 1%, postoperative 2,9% and total 3.9%. The total complication rate in hysterectomy cohort was 5.2% (intraoperative 1.4%, mainly cystotomies, and post-operative 3.8%), in the non-hysterectomy sub-group 0,4%. [40] A 2023 Cochrane review article concluded that adverse events in vNOTES hysterectomy trials were rare, but further research is recommended. [41]

Comparison to other hysterectomy methods

Many studies have shown that vNOTES hysterectomy has several advantages over other hysterectomy methods.

The biggest impact on the success of vNOTES operations has come from its comparison with TLH. The first well known HALON randomized study was published in 2019 by Baekelandt et al. In both groups, 35 TLH and 35 vNOTES hysterectomies were successfully performed without conversion. A significant difference was noticed in postoperative hospitalization time. Discharge home in less than 12 hours was possible in 77% of vNOTES patients vs 43% in TLH group and the mean

hospital stay was shorter in vNOTES group (0.8 vs.1.3 days). [42] A 2020 meta-analysis by Housmans et al showed that operative time, length of hospital stay, and estimated blood loss were significantly lower in vNOTES hysterectomy than in TLH, and there was no significant difference in intra- and postoperative complications, readmissions, and postoperative pain scores nor a change in hemoglobin levels.[43] Michener et al published another meta-analysis in 2021 comparing vNOTES hysterectomy to single port and multiple port laparoscopic hysterectomy. He concluded that vNOTES hysterectomy may have shorter operation times and improved EBL (estimated blood loss), transfusion rates, length of hospital stay, and pain scores compared with multiple port laparoscopic hysterectomy, but recommended further studies due to limited data.[44]

Imai K et al published in 2023 their results of postoperative complete recovery by comparing robotic vNOTES hysterectomy to robotic TLH. Both postoperative day 7 and 28 complete recovery rates were significantly higher in vNOTES group (62.7% vs 7.3% and 100% vs 56.1%)[32]

Comparison to VH (vaginal hysterectomy) also shows promising results. Aharoni et al found in 2021 that vNOTES hysterectomy had lower mean operative time and mean anesthesia time, and slightly longer median

hospital stay (3 vs. 2 days). When sacrouterine ligament suspension was added to both groups, vNOTES had lower incidences of intraoperative complications (6%vs.18%), intraoperative ureteral obstruction (0%vs.8%) and less estimated blood loss (58 ± 68 ml vs. 143 ± 87 ml). [20] Merlier et al compared VANH to VH and found that there was no difference in the rate of outpatient surgery (77% vs 75%), no difference in surgical outcomes, except for the significantly higher rate of salpingectomies or adnexectomies in the vNOTES group. [45]

Learning curve

What about implementing this new technique? Kim et al published in 2020 that port installation time and total operation time appeared to reach the proficiency by case 10.[46] Wang et al showed that 20 cases were required to achieve proficiency in vNOTES hysterectomy for large uteri (>1 kg). [10] Lowenstein et al published in 2021 that operating time of vNOTES hysterectomy together with sacrouterine ligament suspension diminished from mean 149 minutes (89-233) to mean 103 minutes (89-170) when comparing first 13 patients to the next 13 patients. [21]

Conclusions

vNOTES hysterectomy is one of the fastest growing hysterectomy methods in the world.

Studies have shown several advantages for patients compared to all other hysterectomy methods. Both vaginal and vNOTES hysterectomy should be (re)introduced into the practice of every minimally invasive gynecological surgeon and offered as a first choice to all eligible patients.

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True broad ligament adenofibroma: a rare case entity

28

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Introduction:

Tumors of the broad ligament are rare with most of them being secondary to other pelvic pathologies. Most neoplasms in this region present clinically with insidious and nonspecific symptoms and are discovered only incidentally during a gynecological examination for lower abdominal pain or discomfort (1). They are often difficult to distinguish from other adnexal lesions considering their location and rare occurrence. Confusing such lesions with ovarian or tubal masses is very common and

hence a high index of suspicion is needed for their accurate preoperative diagnosis. Suspicion of such a lesion may allow for planning minimally invasive surgical interventions, with organ-preserving techniques in young patients.

Here, we present a rare case of True Broad Ligament Adenofibroma in a young asymptomatic woman.

Case presentation:

A 32-year-old female presented to the outpatient department for pre-conceptional

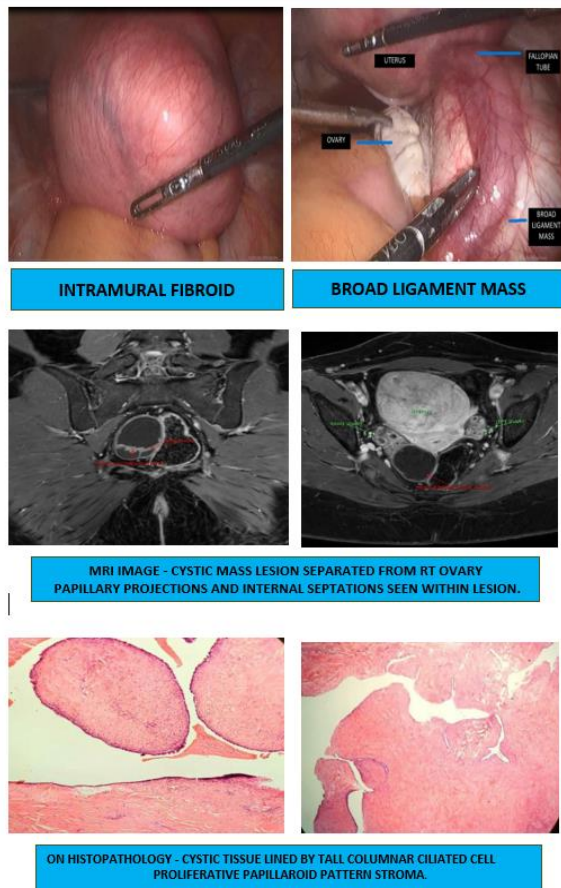
counseling. She was married for 2 years and was planning to conceive. There were no menstrual complaints. Couple was co-habiting with no coital error. She had an average built with a body mass index of 29.4 kg/m². General examination was unremarkable. On abdominal examination, a freely mobile lump with smooth margin was felt arising from the pelvis. Vaginal examination revealed a freely mobile, 14-16 weeks size retroverted uterus. On bi-manual examination, the lump was felt to arise from the uterus. Also, another non-tender mass, approximately 3 x 2 cm was felt in the right adnexa, separate from the uterus. Transvaginal ultrasonography revealed 7.85 x 7 x 8 cm large intramural fibroid (FIGO 2-5) at the uterine fundus. Another 5 x 2.8 cm right adnexal complex mass was also visualized, with uniform margins, multiple septations (septal thickness of 3.4 mm) and minimal vascularity. Right ovary could not be visualized separately from the mass. On Contrast Enhanced MRI pelvis, fibroid as discussed prior was noted. 3 x 3.8 x 5.2 cm well defined cystic mass with enhancing internal septations and tiny papillary projections was visualized in the right adnexa separate from ovary s/o- either Hydrosalpinx or para ovarian cyst (Fig 1). Tumor markers viz CA-125, Serum LDH,

CA-19.9 and Alpha fetoprotein were sent, which came out to be normal. Hence, a laparoscopic procedure was planned. On laparoscopy, peritoneal fluid cytology was sent to rule out malignant cells which came out to be negative. 8 x 8 cm fibroid was noted, arising from the fundus anterior wall of the uterus and 5 x 4 cm complex cyst visualized in the right mesosalpinx separated from the fallopian tube and right ovary. Myomectomy and right meso-salpingeal cyst/broad ligament cyst excision was done without disturbing tubal anatomy. Care was taken to avoid any cyst rupture during excision. It was removed in toto, using the Endo bag without spillage in the pelvic cavity and specimen was sent for histopathological examination.

Histology report showed leiomyoma for the first specimen. Gross examination of the second specimen suggested congested and hemorrhagic external surface with polypoidal growth arising from the cyst wall. On microscopy: - Cystic tissue seen, lined by tall columnar ciliated cells. Stroma showed benign proliferation forming a papilloid pattern. No e/o atypia or malignancy. The findings were suggestive of adenofibroma of the mesosalpinx. The postoperative period

was uneventful, and the patient was discharged the next day.

Figure 1: Broad Ligament mass



Discussion:

Broad ligament is the fold of parietal peritoneum that is reflected over the female genital tract, extending from the uterus to the lateral pelvic wall. This double-layered sheet of mesothelial cell is continuous with each other, and between them is the extraperitoneal tissue (parametrium), containing the connective tissue, smooth muscles, and neurovascular elements. Embryonic remains are also normal component and may give rise to some of the unique neoplasms of the broad ligament, arising from the mesonephric (Wolffian) and paramesonephric (Müllerian) duct remnants (2). Other incidental tissues may also exist, such as heterotopic hilar cell clusters or adrenal cortical rests.

Tumors of the broad ligament can be classified on the basis of their place of origin or histology. Those arising exclusively from the broad ligament are called “Primary or True broad ligament tumors”, which are rare. Majority of tumors in the broad ligament are secondary to malignancies arising elsewhere in the pelvis, like endometrial, cervical, ovarian and other tumors not arising in the female reproductive tract (3). According to Gardner et al, a tumor primarily arising from the broad ligament, must occur on or in the broad ligament, but be completely separated

from, and in no way connected, with either the uterus or the ovary (4).

Based on histology, tumors of the broad ligament can be of different types including, Epithelial tumors of Müllerian type, mesenchymal tumors, tumor-like lesions, and secondary tumors (Table 1). The most common among them are the leiomyomas. Among all the reported carcinomas, serous adenocarcinoma, clear cell adenocarcinoma and endometrioid adenocarcinoma are the most common histologic variants.

Meso-salpingeal / Broad Ligament Adenofibromas are rare tumors with low malignant potential. Although its origin is not clear, it is hypothesized to be an embryological remnant originated from the mullerian duct rather than a neoplastic proliferation process. The precise origin of broad ligament carcinomas is not known, but there are several hypotheses concerning their histogenesis like their origin from Serous Tubal Intraepithelial Carcinoma (STIC) lesions, similar to the ovarian high-grade serous carcinomas. As per another hypothesis, borderline and benign serous tumors transform into carcinoma, similar to that seen in ovarian carcinoma. These benign serous tumors originate from inclusion cysts derived from the coelomic epithelium, which

covers the ovarian and broad ligament surfaces. The primary endometrioid and clear cell adenocarcinomas of the broad ligament have their origin in the Mullerian ducts and arise from background endometriosis (5). Most likely, the endometrioid carcinoma originate from an occult focus of endometriosis. The association of broad ligament carcinomas with endometriosis, as well as endosalpingiosis, was also reported in a few cases (6,7). The Mullerian-origin broad ligament tumors occur predominantly in reproductive women, but in the infertile and nulliparous, pointing out a possible hormonal role in the histogenesis of these tumors (8).

As the first-line study, transvaginal ultrasound can suggest broad ligament tumor when it allows clear visual separation of the tumor from the uterus and ovaries, but magnetic resonance imaging (MRI), with its multiplanar imaging capabilities, can be useful for differentiating broad ligament tumors from masses of ovarian or tubal origin. Other information provided by the MRI, such as tumor size and presence of any metastatic lesion or lymph nodes, are crucial findings for preoperative planning and counseling, making it the gold standard imaging modality. Due to the location and size of several of these tumors, surgery is

challenging, specifically since the surrounding structures such as the ureters and iliac vessels may be at risk. Commonly, accurate diagnosis of broad ligament tumors is difficult pre-operatively, it is commonly established during surgery or at the histopathological evaluation (9).

Elangovana et al reported a case of a primary broad ligament adenocarcinoma in a 43-year-old female with a prolonged complaint of abdominal pain and intermittent urinary retention, requiring frequent catheterization (10). She was diagnosed with obstructive right hydroureteronephrosis secondary to an endometrioid adenocarcinoma of the broad ligament for which total abdominal hysterectomy, right salpingo-oophorectomy, pelvic lymph-nodal sampling was done followed by adjuvant chemo and hormonal therapy.

Khatib et al reported a case of Serous papillary cystadenofibroma (SPCAF) of the fallopian tube in a 30-year-old female who presented with pain and large abdominal mass (11). It was wrongly diagnosed as ovarian neoplasm on computed tomography. However, during surgery the tumor was found to arise from the fallopian tube and was treated with tubal cystectomy with ovarian sparing.

Tavares et al reported another atypical case of giant tubal serous adenofibroma of the fallopian tube in a 17-year-old girl who presented with a palpable mass occupying the entire abdomen accompanied by urinary symptoms (12). She underwent a laparoscopic surgery with drainage of 1800 mL of yellow, citrine liquid from the cyst followed by left salpingectomy.

Most neoplasms in this region, whether benign or malignant, usually present with vague symptoms and are often discovered during a routine gynecological examination. Distinction of mesosalpingeal tumors from other solid tumors of ovary, uterus or retro peritoneum is challenging anatomically & radiologically. As a result, these lesions are frequently found incidentally during surgery. These tumors are usually benign hence extensive surgery is not required and simple excision suffices.

Conclusion:

Masses arising from the broad ligament are rare. Because of their location, they represent a clinical and radiological problem. An accurate diagnosis can remain difficult despite good clinical and radiological prediction, and diagnosis is often made

intraoperatively. Adenofibromas are rare tumors that can appear malignant macroscopically or on ultrasound. Due to their low malignant potential, an accurate index of suspicion may help avoid radical surgery, especially in young patients desiring fertility.

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Discovery of chylous mesenteric cyst as opposed to suspected paraovarian cyst (Case report)

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Abstract

As a gynecologist many diagnoses come to mind when being presented with a 36-year-old patient with a large unilocular anechoic cyst in the pelvis. One diagnosis which should be added to that list, though being rare and not anatomically linked to the genital organs, is a chylous mesenteric cyst. This case report reflects upon available published data and presents a case of this rather seldom and unexpected condition.

Key words: chylous cyst, abdominal pain, diagnostic laparoscopy, abdominal cyst of unknown origin, back pain

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Introduction: Chylous cysts are a rare occurrence and even more so in the field of gynecology. Predominantly it emerges from the mesentery of the small intestines, but can result from any part between the duodenum and rectum. Incidence settles at 1 in 100,000 patients. The pathogenesis has not yet been determined and the condition can present with a number of unspecific symptoms of the lower abdomen. (1) Preoperative diagnostics frequently reveal a unilocular anechoic cyst of unknown origin which can change position in imaging techniques such as ultrasound and CT-scan. (2)

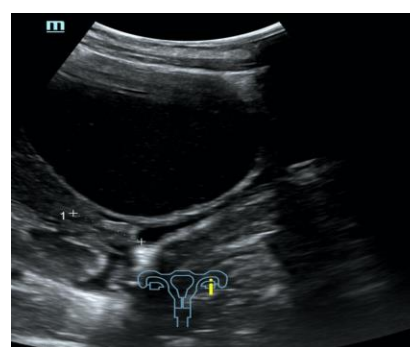
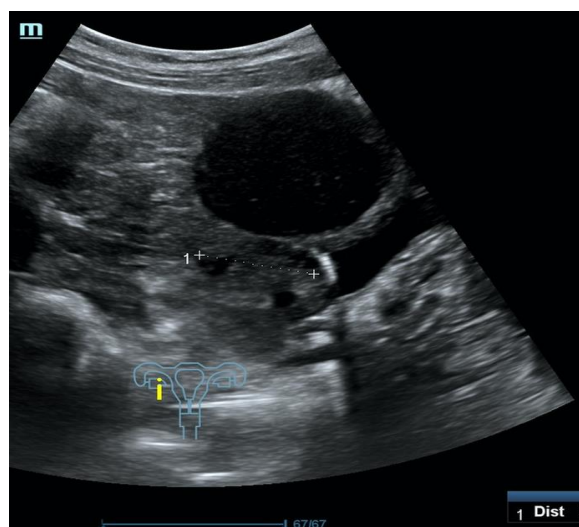
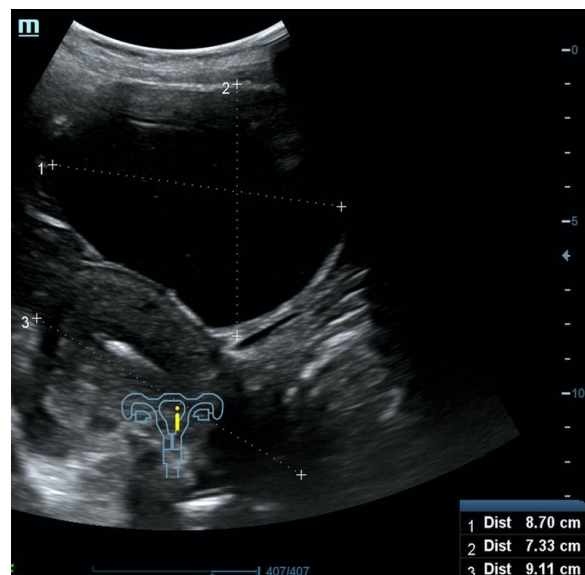
Case description: 36-year-old female patient, no pre-existing illnesses, no previous operations on the abdomen, two previous pregnancies and following vaginal deliveries, regular check-ups with gynecologist without previously noted abnormalities.

According to the patient first symptoms such as cramps and feeling of pressure in the lower and middle abdomen and the inability to stand for extended periods of time, due to severe back pain in thoracic and lumbar region, presented approximately two months before the diagnostic laparoscopy.

One month before the procedure, the patient was admitted to the orthopaedic department of a different hospital with severe back pain, during which a CT-scan was administered which revealed a large cyst in the abdomen of unclear origin.

A follow-up appointment was made with her gynecologist who suggested a diagnostic laparoscopy assuming the anechoic round

structure, in close proximity to the inconspicuous ovaries, could be a paraovarian cyst (see ultrasound pictures 1,2 and 3 below).



Ultrasound
view
Picture 1-3

When entering the abdomen at laparoscopy the pelvis was predominated by an approximately 10 cm in diameter round structure. When initiating

Trendelenburg position the previously mentioned structure relocated to the middle to upper abdomen.



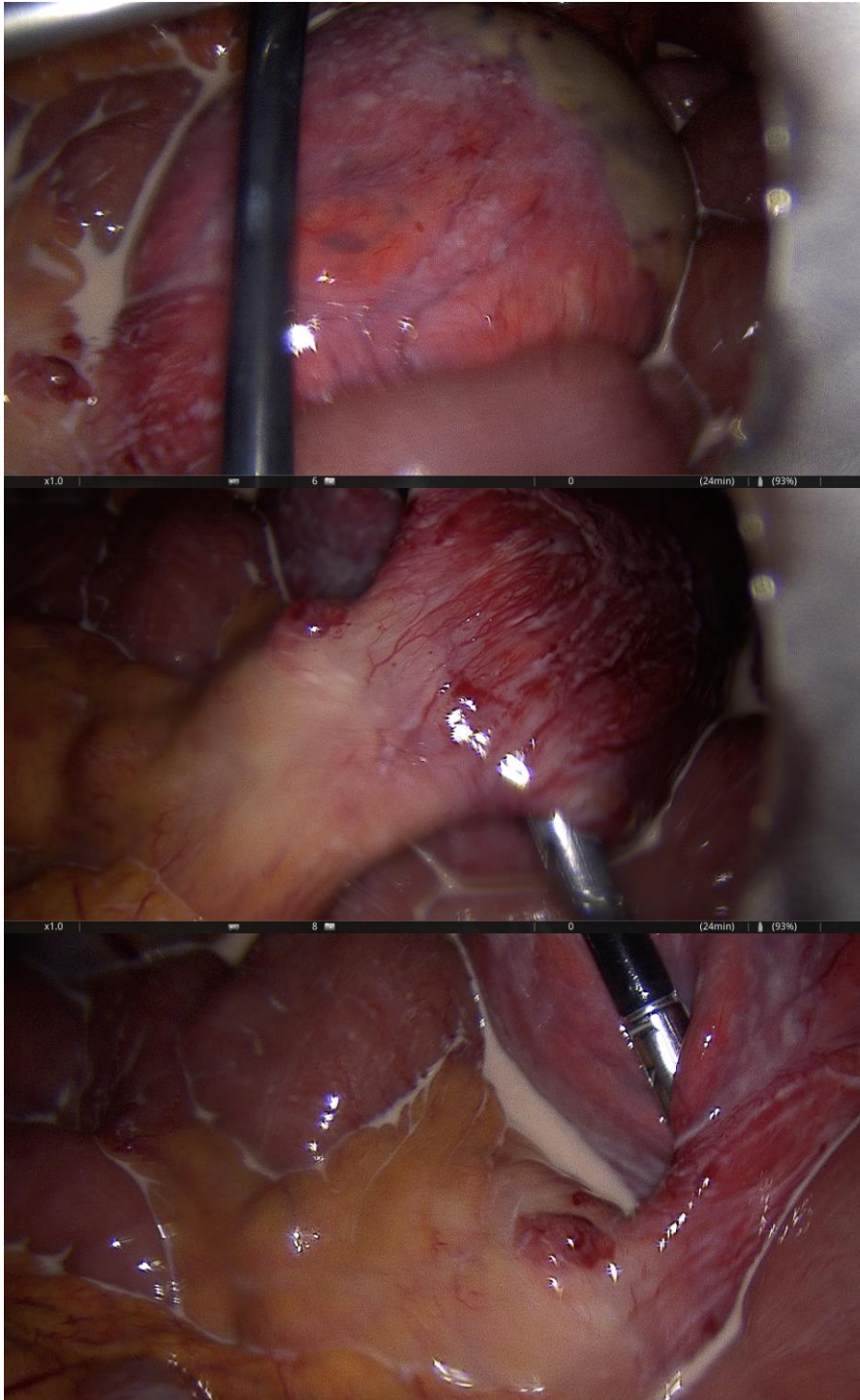
Picture 4: First sighting when entering the abdomen laparoscopically

The described structure was vulnerable to touch by surgical instruments. A milky low-viscous fluid was released (see picture 7 below) and upon close inspection it became clear the cyst was connected

to the mesentery of the small bowel. The small connection (see picture 6) was ligated and cut via endoscopic stapler. The cyst was removed via endoscopic plastic bag. The pathological exam confirmed clinical diagnosis.

The postoperative period concluded without any complications and the abdominal surgical drain which had been inserted into the abdomen as precautionary measure was removed on day two after surgery and the patient was discharged.

Discussion: Despite literature indicating that chylous cysts are a condition more frequently associated with male patients and also more commonly diagnosed in the fifth decade of life, there are many similarities when comparing the presented patient who is a female in her thirties with other case reports. (3), (4), (5) Therefore chylous cysts should be added to the list of differential diagnoses that need to be considered in the gynecological field when treating patients with abdominal cysts of unknown origin.



Pictures 5,6 & 7: First one showing the whole extend of the cyst, middle one showing the connection between the chylous cyst and the mesentery go the smaller intestine and the lower one showing the milky-fatty fluid which erupted from the cyst

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Use of perioperative micro-colpo-hysteroscopy to evaluate margins of loop excision

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Abstract

The author recalls how microcolpohysteroscopy is a technique more than forty years old that allows to observe the cells of the uterine cervix "in vivo", without the need to carry out a bi-opsy and send it to the laboratory for a diagnosis. For many years he has been using pre-operative microcolpohysteroscopy to precisely establish the margins of the lesion to be re-moved, and obtain a minimally invasive surgery. Two cases are presented in which a peri-operative microcolpohysteroscopy is performed on the surgical cone, to evaluate - in the operating room - whether the excision was adequate and did not leave residual lesions on the uterine cervix. Histology on the removed cervical cones confirms (after a few days) the peri-operative diagnosis, thus demonstrating the effectiveness of using this method for a tailor-made surgical excision.

Key words: Microcolpohysteroscopy; Cervical Pathology; HSIL; LEEP; Conization; Uterine Surgery

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Introduction

The Micro-colpo-hysteroscope by Storz GmbH was created in 1980 based on a design by Dr. Jacques Hamou 1 and put on sale in July 1981. The instrument, over the years, has undergone some modifications to make it more manageable, and has the characteristics of a hysteroscope, a colposcope and a microscope capable of magnification up to a maximum (currently) of 80x. (Fig. 1) Several studies have highlighted how it is possible to observe preneoplastic lesions induced by the Human Papilloma Virus (HPV) on the uterine cervix, and their possible extension within the cervical canal 2, 3, 4 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 .

Unfortunately, the method practiced by a few specialists around the world did not have the diffusion it deserved. The main reason lay in the fact that the micro-colpo-hysteroscopic diagnosis requires the skills of the cytologist (able to recognize and diagnose the cells of the uterine cervix) and the gynecologist (who - unlike the cytologist in the laboratory - sees and visits the patient in his own office).

Following the limited diffusion and consequently the reduced amount of instruments sold, the manufacturing company ceased production of the Hamou micro-colpo-hysteroscope type I, and subsequently of the type II, replacing both with a reduced caliber instrument (2.5 mm) which makes seeing the cells slightly more difficult. This inconvenience can be overcome by using an endoscopic camera equipped with a zoom, which allows a visual increase on the screen such as to allow a vision comparable to that of the old models.

Currently, the distribution of the Hamou type III micro-colpo-hysteroscope is not widespread throughout the world, and this

explains the difficulty in purchasing it for those gynecologists interested in using it in their clinical practice.

For those who own a Micro-colpo-hysteroscope, or have the opportunity to purchase one, I remind of the standard procedure for obtaining an excellent view of the cells directly "in vivo" on the patient.

In addition to the Hamou micro-colpo-hysteroscope, it is necessary to have 5% Lugol's solution and Waterman's blue ink, the only elective vital dye for the squamous epithelium of the uterine cervix.

After having exposed the uterine cervix with a common vaginal speculum, as if carrying out a cytological sample, the epithelial surface must be cleaned of mucus with a cotton ball soaked in physiological solution (never use acetic acid as it would cause edema of the mucosa and would prevent subsequent observation of the cells!)

We then proceed with a close observation without any staining, and - after the application of Lugol's solution - the same procedure will be repeated to observe any iodo-weak areas.

Obviously, these will be the areas where the cellular elements will be evaluated most carefully.

The application of Waterman's Blue ink (able to color only the elements of the squamous epithelium or those of squamous metaplasia, leaving the cylindrical cells colorless), allows the subsequent observation of the cells in contact.

This means that by placing the distal lens in contact with the epithelium, and acting on the knob for correct focusing, we have the possibility of seeing the same images as the cytologist when observing a slide, but with

the enormous advantage of knowing the location and extent, in case of cytopathic alterations induced by the human papillomavirus

Material and methods:

We report two cases recently sent to our attention, in which a micro-colpohysteroscopic diagnosis of High-Grade Intraepithelial Lesion (HSIL) was made, and subsequently subjected to surgical removal with loop.

Case #1: 26-year-old patient, with cytological diagnosis of ASCUS, and positivity for HPV 51 and 53. The Microcolpohysteroscopy highlights the presence of a High Grade Intraepithelial Lesion (HSIL), not detected by the cytological examination, and therefore we suggest excision with loop of the pathological areas (Fig. 2)

Case #2: 30-year-old patient, suffering from multiple sclerosis diagnosed at the age of 17, currently being treated with Mavenclad® (cladribine: chemotherapy and immunosuppressant drug used for the treatment of hairy cell leukemia and relapsing-remitting multiple sclerosis) after months of treatment with Cortisone. Indication for Microcolpohysteroscopy was cytological diagnosis of LSIL and positivity for HPV 31 and 51. The exam highlights a High-Grade lesion (HSIL) and excision of the pathological areas is suggested (Fig. 3) Few weeks later both patients are placed in the operating room, under general anesthesia with Propofol®; genitals are disinfected and the location and extent of the alterations attributable to HSIL are checked once again. After the examination, we proceed with local infiltration with epinephrine diluted 1:200,000 for preventive hemostatic

purposes, and a loop of the appropriate size is chosen (not too small nor too large), to carry out a tailor-made excision. Immediately after the excision, micro-colpohysteroscopy is repeated on the margins of the uterine cervix, and on the removed cervical cone, to verify that they are free from the disease (Fig. 4) Once the presence of external and internal margins free from the disease has been ascertained, it is possible to proceed with the coagulation of the bleeding vascular nozzles, without having to repeat a deeper or wider excision (Fig. 5)

Results:

Both patients underwent a "tailor-made" excision of the pathological areas, so as to avoid the risk of excessively wide or deep, or insufficient removals, with the risk of leaving residual HSIL areas on the cervix. The histological examination provided by the laboratory fully confirmed both the diagnosis (HSIL = CIN 2) and the accuracy of the excision, reporting the disease-free margins (Fig. 6)

Discussion:

Microcolpohysteroscopy has for years been used almost exclusively as a diagnostic investigation to confirm or exclude the presence of a preneoplastic lesion on the uterine cervix, and to identify its margins so as to send this precious information to the surgeon who will have to perform the excisional surgery. This article proposes to use the technique in the operating room, immediately before and immediately after the use of the electric loop to remove the pathological tissue, and to verify its effectiveness.

Excisional treatment of high-grade cervical lesions is normally carried out using an electric loop whose dimensions depend on

the exocervical extension of the pathological areas observed on the exo-cervix using conventional colposcopy.

Unfortunately, this procedure can have two drawbacks: the macroscopic observation of the external limits of the observed lesion cannot have the same accuracy as the microscopic vision, capable of establishing the external limits of the cellular alterations to be removed, and secondly the colposcopic observation does not accurately determine the endocervical extent of the lesion.

As a consequence, it is not uncommon to obtain an incomplete excision of the pathological tissue, with the risk of having to repeat the treatment again due to the persistence of the disease.^{17,18}

On the contrary, especially in initial high-grade lesions, standardized excisional treatment can remove an excessive amount of tissue, and this is not desirable in young subjects with the desire to become pregnant.


Personalization of treatment is the solution to the problem. Immediately before choosing the size and shape of the loop, an accurate micro-colpo-hysteroscopy is carried out, with the patient on the operating bed. Once the external and endocervical margins have been established, the loop is chosen. The excision takes place with a decisive and progressive passage of the loop in an antero-posterior or lateral-lateral direction, depending on one's habits, and immediately after the removal of the fragment of cervix, a new microcolpohysteroscopic check is carried out on the margins of the residual cervix, and on the removed piece, applying Waterman's blue solution again, to be able to observe the cells. If pathological cellular elements are observed on the margins of the uterine cervix

or of the removed cervical cone, it will be possible to proceed with a slight enlargement of the excision, thus avoiding learning of the incomplete excision only following the histology report, having to repeat a new hospitalization for the patient to complete the surgical treatment.

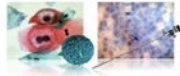
While the advantages of this method appear evident, the only disadvantage is linked to the difficulty of acquiring the instrument or learning the technique, which unfortunately is still reserved for a few specialists today.

Conclusion:

The use of preoperative micro-colpo-hysteroscopy to precisely identify the tissue to be removed allows for a "therapeutic" conization to be obtained, enormously reducing the risk of carrying out an incomplete or excessive excision. Furthermore, the immediately postoperative micro-colpo-hysteroscopic control on the margins of the uterine cervix allows an immediate evaluation of the total removal thus reducing the risk of persistence of the lesion.

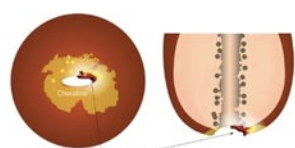


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Diagnostica e Terapia Endoscopica
in Ginecologia



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Name of the patient: _____ Date: _____
 Sent by Dr: _____ LMP: _____
 Indication: **ASCUS HPV 51 & 53** Date of birth: _____



**Focal area of CIN 2
on squamous metaplasia**

Squamo-columnar junction:
Type I: entirely endocervical
Type II: Partially endocervical
Type III: entirely endocervical

Normal microcolposcopy aspects

Mature original squamous epithelium Yes No

Atrophic squamous epithelium Yes No

Cylindrical epithelium Yes No

Squamous metaplasia Yes No

Nabothian cyst Yes No

Glandular orifices or crypts Yes No

Deciduous gravidarum Yes No

Squamo-columnar junction

Non-specific aspects

Polipo Yes No

Cheratosi Yes No

Abnormal microcolposcopy aspects

VCE (Viral Cytopathic Effects) Yes No

CIN 1 or structured condyloma Yes No

Yes No

Invasive Carcinoma Yes No

Lesion localized to the 1st quadrant Yes No

Lesion localized to the 2nd quadrant Yes No

Lesion localized to the 3rd quadrant Yes No

Lesion localized to the 4th quadrant Yes No

Size of the Lesion

Diagnosis: **High Grade focal Lesion, associated with HPV (= CIN 2 on superficial squamous metaplasia?)**

Suggestions: **Excision of pathological areas**

dott. Luigi Montevocchi

CYTOHISTOLOGICAL REPORT

■ Acceptance No _____
 ■ Report Date _____
 ■ Date of birth _____
 ■ Surgery Date _____

■ Patient: _____
 ■ Doctor: Dott. Montevocchi
 ■ Clinic: Ars Medica
 ■ Department: Ricoveri

Material received marked as:


Cone of uterine cervix

Macro - Microscopic findings

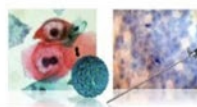
We receive a cervical cone measuring 1.5x1x0.5 cm

Diagnosis:

Sections of uterine cervix with a high-grade intraepithelial lesion, with moderate dysplasia (HSIL-CIN2).
 Surgical excision margins free from disease
 Immunohistochemical staining performed: p16+


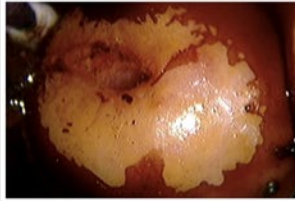


Dott. Luigi Montevocchi
Diagnostica e Terapia Endoscopica
in Ginecologia

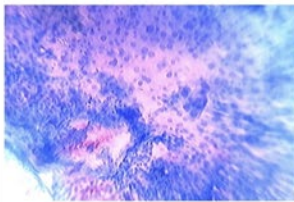
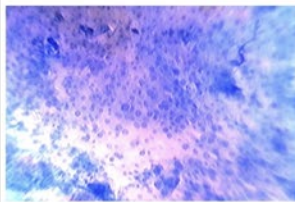


IMMAGINI

Name of the patient: _____ Date: _____
 Sent by Dr: _____ LMP: _____
 Indication: **ASCUS HPV 51 & 53** Date of birth: _____

Uterine cervix without preparation... ...and after Lugol's application

At 150x focal area of HSIL on superficial squamous metaplasia... ...The same, on the anterior lip

Diagnosis: **High Grade focal Lesion, associated with HPV (= CIN 2 on superficial squamous metaplasia?)**

dott. Luigi Montevocchi

CYTOHISTOLOGICAL REPORT

■ Acceptance No _____
 ■ Report Date _____
 ■ Date of birth _____
 ■ Surgery Date _____

■ Patient: _____
 ■ Doctor: Dott. Montevocchi
 ■ Clinic: Ars Medica
 ■ Department: Ricoveri

Material received marked as:

Cone of uterine cervix

Macro - Microscopic findings

We receive a cervical cone measuring 1.5x1.5x0.6 cm

Diagnosis:

Sections of uterine cervix with a high-grade intraepithelial lesion (HSIL-CIN2) of the superficial epithelium
 Present foci of Low Grade Squamous Intraepithelial Lesion with koilocytotic aspects.
 Surgical excision margins free from disease

Dott. Luigi Montevicchi
 Diagnosta e Terapeuta Endoscopico
 in Ginecologia

MICROCOLPOSCOPIA

Name of the patient _____ Date _____
 Sent by Dr _____ LMP _____
 Indication **LSIL - HPV 31, 51** Date of birth _____

■ Area periorificiale di HSIL (= CIN 2 su metaplasia squamosa)
 ■ LSIL

Squamo-columnar junction:
 Type I: Entirely endocervical
 Type II: Partially endocervical
 Type III: Entirely ectocervical

Normal microcolposcopy aspects

Mature original squamous epithelium yes No
 Atrophic squamous epithelium yes No
 Cylindrical epithelium yes No
 Squamous metaplasia yes No
 Nabothian cyst yes No
 Glandular orifices or crypts yes No
 Deciduous gravidarum yes No
 Squamo-columnar junction

Abnormal microcolposcopy aspects

VCE (Viral Cytopathic Effects)
 CIN 1 or structured condyloma yes No
 Invasive Carcinoma yes No
 Lesion localized to the 1st quadrant yes No
 Lesion localized to the 2nd quadrant yes No
 Lesion localized to the 3rd quadrant yes No
 Lesion localized to the 4th quadrant yes No

Size of the Lesion

Non-specific aspects

Polipo yes No
 Cheratosi yes No

Diagnosis **High Grade focal Lesion, associated with HPV (= CIN 2 on superficial squamous metaplasia?)**

Suggestions **Excision of pathological areas**

dott. Luigi Montevicchi

Dott. Luigi Montevicchi
 Diagnosta e Terapeuta Endoscopico
 in Ginecologia

IMMAGINI

Name of the patient _____ Date _____
 Sent by Dr _____ LMP _____
 Indication **LSIL - HPV 31, 51** Date of birth _____

Uterine cervix without preparation...
 ...and after Lugol's application

At 150x focal area of HSIL on superficial squamous metaplasia...
 ...The same, on the posterior junction, about 6 mm inside the cervical canal

Diagnosis **High Grade focal Lesion, associated with HPV (= CIN 2 on superficial squamous metaplasia?)**

dott. Luigi Montevicchi

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Torsion of a subserosal leiomyoma: a rare cause of acute abdomen. (Case report)

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Affiliation: 1 Department of Obstetrics and Gynecology, HMS Al Garhoud Private Hospital, Dubai, UAE

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Abstract

Torsion of a pedunculated subserosal uterine leiomyoma is a rare cause of acute abdominal pain and is a surgical emergency. Early surgical intervention is mandatory to avoid life-threatening complications. The history and clinical picture are usually not specific; therefore, it is imperative to rule out more common causes of acute abdomen and to have a high index of suspicion for torsion of a uterine leiomyoma, especially the subserosal type. We report a case of acute abdomen due to torsion of a pedunculated subserosal leiomyoma in a 46-year-old female patient. The patient presented with acute abdominal pain which, through imaging, was claimed as either a torsion of a pedunculated subserosal uterine fibroid or adnexal torsion due to a left ovarian cyst. The diagnosis of the former was confirmed by laparoscopic evaluation, where a myomectomy of a large, pedunculated subserosal leiomyoma was performed, along with subsequent histopathological examination.

Key words: Uterine Leiomyoma, Torsion, Acute Abdomen, Laparoscopy, Myomectomy

Corresponding author: Wael Hosni

DOI: 10.36205/trocar5.2024006

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Introduction:

Uterine leiomyomas, also known as uterine fibroids, are the most common benign tumors in women of reproductive age. They arise from the smooth muscle lining of the uterus, namely the myometrium. According to their anatomical location, uterine leiomyomas are subclassified into submucosal, intramural or sub-serosal leiomyomas [1]. Not all leiomyomas cause symptoms, but when they do, symptoms can include abnormal uterine bleeding, pelvic pain, dysmenorrhea, pressure symptoms, low back pain and abdominal distension [2]. The symptoms are usually chronic in nature; however, acute presentations do occur. Acute-onset severe abdominal pain has been linked to complications such as red degeneration or spontaneous infarction of uterine fibroids. Another rare but possible cause of acute presentations is torsion of a pedunculated sub-serosal leiomyoma. This can manifest with acute abdominal pain and necessitates an emergency surgical intervention. Any delay in diagnosis can lead to ischemia, necrosis, and subsequent peritonitis [3].

Case report:

A 46-year-old nulliparous woman presented to our emergency department with severe lower abdominal pain. The pain started 2 days earlier, but it was gradually increasing. The pain was associated with nausea but not

vomiting. There was also a complaint of dysuria without hematuria. Her menses was regular, and she did not report abnormal vaginal bleeding, changes in bowel movement, fever or chills. On clinical examination, guarding and tenderness in the lower abdomen were noted. Laboratory investigations revealed leukocytosis (WBC $12.2 \times 10^3/\mu\text{L}$), elevated CRP (120 mg/L), ketonuria (ketones +++) and a negative pregnancy test.

Several imaging studies were conducted on an urgent basis. An abdominal X-ray was unremarkable. A subsequent ultrasound (US) of the abdomen and pelvis revealed multiple uterine fibroids and a large left adnexal mass with some fluid collection in the pouch of Douglas. The blood supply to both ovaries was intact on Doppler ultrasound. Finally, a computed tomography (CT) scan of the abdomen and pelvis confirmed the presence of multiple uterine fibroids and also showed a para-uterine hypodense lesion measuring 7.0 x 5.5 cm in close proximity to the left adnexa. This large left adnexal mass was undifferentiated. A provisional diagnosis of torsion of a pedunculated sub-serosal uterine fibroid or left ovarian cyst leading to episodes of torsion-detorsion of the adnexa was formulated. Other possible causes of acute abdominal pain including diverticulitis, appendicitis or intestinal obstruction were ruled out. A decision to perform an urgent

laparoscopic intervention was taken. The procedure revealed an enlarged uterus with a large necrotic, gangrenous, pedunculated sub-serosal fibroid [Figure 1]. The necrotic fibroid was in close proximity to the left adnexa. Multiple other smaller sub-serosal fibroids were noted. Both adnexa, namely the ovaries and fallopian tubes and their appendages, were normal in size and shape. No adhesions were detected. The urinary bladder, bowel, and organs in the upper abdomen were normal. The base of the necrotic fibroid was identified, and torsion of

its pedicle was confirmed [Figure 2]. The fibroid was detached from the uterus via bipolar coagulation of the pedicle along with subsequent cutting with scissors. Laparoscopic contained bag morcellation was performed and the fibroid was subsequently removed from the abdominal cavity and sent for histopathological examination. The histopathology showed a typical appearance of a leiomyoma with wide areas of infarction, complying with the clinical diagnosis of torsion, and no evidence of atypia.

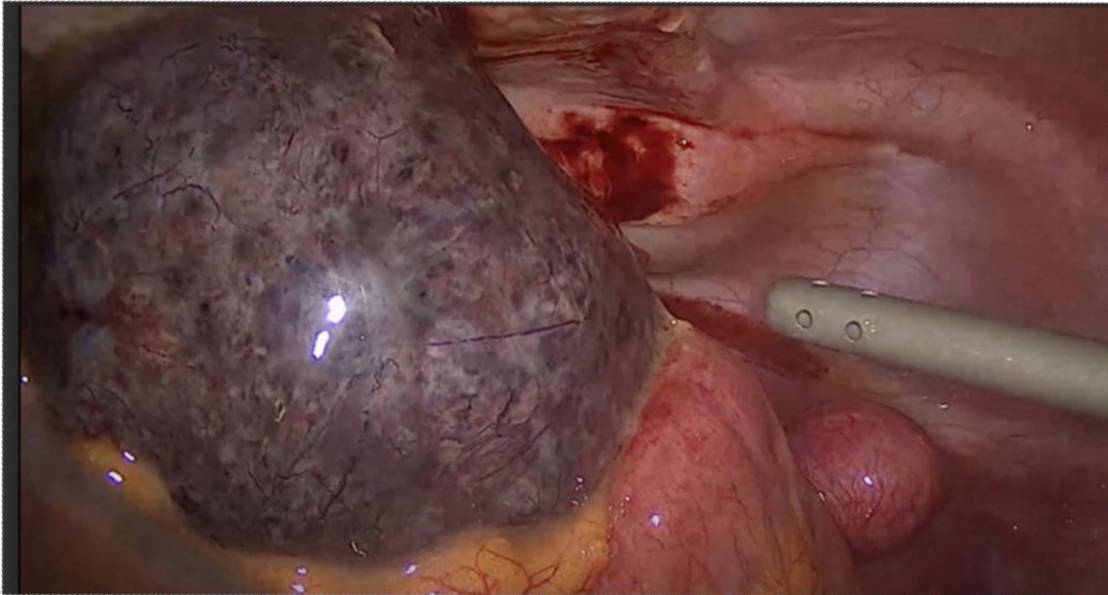


Figure 1. Intraoperative picture of necrotic gangrenous uterine fibroid



Figure 2. Intraoperative picture of torsion of a pedunculated uterine fibroid

Discussion:

Uterine leiomyomas are the most common gynecological tumors in women of childbearing age. They usually present with chronic symptoms, which may include lower abdominal pain, abdominal distension, abnormal uterine bleeding, low back pain, dysmenorrhea and pelvic pressure symptoms. Torsion of a pedunculated subserosal leiomyoma is a rare presentation that occurs acutely [4]. Pain arising from leiomyomas is often attributed to acute degeneration. However, this type of pain is self-limiting and responsive to analgesics unlike fibroid torsion [5]. In our case, the

patient had reported severe pain prior to admission. The pain was not responsive to the over-the-counter analgesics she had been taking.

The clinical presentation differs with respect to the extent of the angular rotation of the pedicle and the rapidity at which it arises. If the rotation is incomplete and episodic with autonomous untwisting, the symptoms may be periodic or persistent and may even withdraw spontaneously. Complete torsion, however, impedes the circulation. It initially involves the venous flow, resulting in edema and congestion, and subsequently the arterial supply, leading to hemorrhagic necrosis,

gangrene and acute abdominal pain [6]. In our case, the fibroid was completely gangrenous as evidenced by the gross picture and histopathological assessment. Moreover, reaching this differential is very challenging preoperatively, and a delay in diagnosing this surgical emergency or a misdiagnosis with the more common fibroid degeneration can lead to life-threatening complications including peritonitis and sepsis [7]. History and clinical examination do not provide conclusive clues to the diagnosis, and most clinicians rely heavily on imaging modalities to reach diagnosis and exclude differentials [8]. In most cases, reaching a diagnosis may still be challenging preoperatively, and the diagnosis may only be made at the time of surgery.

The first-line imaging technique is pelvic ultrasonography due to its accessibility and cost-effectiveness. Color Doppler can question the presence of possible torsion of a pedunculated sub-serosal leiomyoma if decreased blood flow through the pedicle is confirmed. The pedicle, however, can sometimes be thin or not seen at all, which limits the efficacy of ultrasound as an investigating tool for this diagnosis. CT with contrast enhancement is a suitable modality, particularly in assessing abdominal pain in emergency departments. The typical CT findings on torsion of a pedunculated subserosal leiomyoma may include lack of central contrast enhancement with an

enhancing rim, producing the 'dark fan sign', interval changes in size, and congestion of the vascular pedicle at the site of torsion. Moreover, CT imaging reliably rules out other differentials of abdominal pain. Consequently, the role of CT scan might be deemed the primary diagnostic utility to accurately diagnose this cause of acute abdomen while eliminating other potential alternatives. MRI with contrast enhancement is known for its higher sensitivity and specificity in assessing uterine fibroids; however, it is a time-consuming technique that requires a stable patient. This may be challenging when patients are in severe pain. Therefore, it may be impractical to implement this imaging modality in the emergency department. An MRI scan that marks the presence of a necrotic leiomyoma that is sub-serosal and has an intervening pedicle likely warrants the diagnosis of torsion [3,4].

The conventional management of torsion of a pedunculated sub-serosal fibroid is surgical intervention which involves myomectomy or even hysterectomy. However, the modality differs depending on the age of the patient, the condition of the uterus and whether she wishes to retain her fertility afterward. Generally, myomectomy, whether laparoscopic by laparotomy, is the method of choice in women of childbearing age [9]. Laparoscopic myomectomy has proven to have more favorable outcomes with regards

to blood loss, postoperative pain and overall complications compared to laparotomy [10].

Conclusion:

Even though this condition is extremely rare, every clinician has to bear in mind that torsion of a pedunculated sub-serosal uterine fibroid can be a potential cause of acute abdominal pain that requires immediate surgery. The available imaging modalities may be helpful in confirming the diagnosis and ruling out other causes of acute abdomen. Lastly, it is imperative to differentiate between pain that is attributed to acute degeneration and pain resulting from torsion. Once torsion of a pedunculated fibroid is suspected, prompt surgical intervention should be considered.

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Laparoscopic Repair of Caesarean Scar Defect using Indocyanine Green (Video Case report)

54

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Objective:

To show how the use of indocyanine green would allow to identify and facilitate the resection of the isthmocele by laparoscopy.

Design:

Stepwise demonstration of the technique with narrated video footage.

Setting:

Every year around the world, between 20% and 35% of births occur via Caesarean section, and in most regions of the globe caesarean rates continue to grow [1-3].

Isthmocele was first described in 1961 by Poidevin, as an anatomical dehiscence in the uterine scar area, mainly identified through imaging techniques like transvaginal ultrasound with or without fluid injection, hysterosalpingography, magnetic resonance imaging, and hysteroscopy [2, 4]. Reported prevalence varies from 24–70% with transvaginal sonography and 56–84% with sonohysterography [5]. Although most are asymptomatic, isthmocele should be suspected in women with spotting, dysmenorrhea, pelvic pain, and a history of infertility [6, 7]. Moreover, it could be associated with pregnancy complications, such as preterm delivery, uterine rupture, caesarean scar pregnancy, and abnormally adherent placenta [3]. Surgery is indicated in case of failure or contraindications to medical treatment. Currently, laparoscopic resection of the defect is the mainstay therapy method in patients with residual myometrium less than 3 mm and a desire to conceive [4, 8, 9]. Multiple strategies have been postulated to identify the isthmocele, such as the concomitant use of hysteroscopy, Foley

catheter, or some dyes [3, 9, 10]. Indocyanine green is a dye used in medicine since the mid-1950s for various applications, due its extensive safety margin and near-infrared fluorescent optical advantage [11, 12]. Based on the ability of a dye to emit a fluorescent signal when excited with a light source at a specific wavelength and the highest tissue penetration depth, in this article, we propose the use of indocyanine green to identify the area to be resected in the laparoscopic treatment of Isthmocele.

Patient:

A 41-year-old patient with a history of two previous cesarean deliveries presented a history of abnormal uterine bleeding and chronic pelvic pain that did not respond to medical treatment. The patient referred to desire for future fertility. Ultrasonography reveals residual myometrium of 2 mm, therefore, surgical treatment is decided. The patient underwent laparoscopic excision of Isthmocele using indocyanine green to locate and resect the defect.

Intervention:

Laparoscopic repair of the Isthmocele was performed. Key strategies were: (1) Under laparoscopic vision, insertion of a uterine cannula into the uterine cavity reaching uterine Isthmus (3-4 cm from external cervical orifice). Through the uterine cannula 3 cc (7,5 mg) of indocyanine green dye without dilution was instilled and 3 minutes after, the uterine cannula was moved until achieving uterus fundus; (2) Careful dissection of the uterovesical peritoneal fold for mobilize bladder from the lower uterine segment; (3) Identification of the Isthmocele site with the use of near-infrared fluorescence imaging; (4) Resection of the defect is resected with monopolar scissors; (5) Placement of a uterine manipulator into the cervix to avoid the closure of the uterine canal to facilitate suturing; (6) Reapproaching of the edges with the use of a single layer of interrupted 2-0 Vycril sutures.

Conclusion:

Laparoscopic surgical treatment of Isthmocele is a good alternative in patients

with symptoms who do not respond to medical treatment, with wishes for fertility, and who present a residual myometrium of less than 3 mm. We propose using indocyanine green since it allows the evaluation and identification of the area to be resected without needing another procedure.

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10.36205/trocar5.2024005	Use of perioperative micro-colpo-hysteroscopy to evaluate margins of loop excision
10.36205/trocar5.2024006	Torsion of a subserosal leiomyoma: a rare cause of acute abdomen. (Case report)
10.36205/trocar5.vid24001	Laparoscopic Repair of Caesarean Scar Defect using Indocyanine Green