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ORIGINAL ARTICLE

Ultrasonographic and Hysteroscopic Assessment of Uterine Cavity After Myomectomy

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Abstract

Background: **Growth of the uterus's smooth muscles and connective tissue is known as uterine fibroids. They are viewed as the most widely recognized harmless growth of the pelvis. Moderate a medical procedure stays the primary methodology for the board of uterine myomas. Myomectomy is viewed as a significant choice for women who want future childbearing or essentially need to protect their uterus.**

Objective: **The goal of this review was to assess the uterine cavity using hysteroscopic and ultrasonographic devices.**

Patients and methods: **A planned (observation) logical plan was used in this review. Our research included 50 patients chosen from the short-term gynecological facility (Al-Hussien and Sayed Galal Hospital at Al-Azhar University).**

Results: **The aim of the review was to assess the uterine hole using hysteroscopic and ultrasonographic devices. This research included 50 patients chosen from the short-term gynecological facility (Al-Hussien and Sayed Galal Hospital at Al-Azhar University), with similar incorporation and rejection standards.**

Conclusion: **From our review, we could reason that hysteroscopy further enhances the results of 3−4D ultrasound imaging. It is not as of now accessible in all units, and its utilization has huge ramifications regarding cost and preparing. Saline implantation then again might be embraced effectively utilizing different devoted frameworks or changes of promptly accessible less-expensive catheters, for example, intrauterine insemination catheter.**

Keywords: 3−4D ultrasound, Hysteroscopic myomectomy, Uterine cavity, Uterine fibroids

1. Introduction

Uterine fibroids are benign neoplasms sharing identical smooth muscle filaments with myometrium. Fibroids can cause various side effects relying upon their size and area inside the uterus. Family history is a key variable. Moreover, fibroids are more common in African women than other races. Estrogen will in general animate the development of fibroids much of the time. Fibroids happen in around 70−80% of all women when they are the age of 50 years.[1]

Ultrasound is the easiest and least expensive method for imaging the fibroids.

There are numerous approaches to deal with trouble-causing fibroids like myomectomy and hysterectomy. GnRH analogs cause a hypoestrogenic condition and are administered for 3−6 months. These drugs may be used to contract large leiomyomas before surgery.[2] Recently, other modalities have emerged like cryosurgery,[3] uterine artery embolization,[3] and high-intensity focused ultrasound.[2]

Direct visualization of the uterine cavity is allowed through hysteroscopy.[4]

Sonographic diagnosis of various endometrial diseases has been significantly enhanced by the introduction of sonohysterography (SHG). Becker et al.[5] showed that SHG is a crucial complement to transvaginal sonography and offers more information, particularly before therapeutic approaches for myomas. The goal of this study was to assess the uterine cavity after myomectomy using hysteroscopy and ultrasonography.

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2. Patients and methods

A total of 50 patients from the short-term gynecological institution were included in this research (Al-Hussien and Sayed Galal Hospital at Al-Azhar University). A planned (observational) logical plan was utilized in this review.

Inclusion criteria were as follows: according to segment information, women mentioned in this research should be in their postfeminine period and patient age around 30 years.

Exclusion criteria were as follows: pregnancy demonstrated or intriguing, presence of any uterine abnormality, history of past uterine medical procedure, IUCD should be avoided, and any uterine procedures as D and C.

2.1. Methods

SHG timing included the main period of the feminine cycle.

Educated informed assent regarding every patient ought to be taken.

Hysteroscopy: point-by-point hysteroscopy assessment was done under broad sedation, searching for gross endometrial injuries, polyps, and unusual vascular examples.

It was finished for all cases utilizing unbending all encompassing kind with a persistent water system and pull sheath with an external sheath of 5.5 mm and a 30° front slanted focal point (Germany's Circon Acmi).

2.2. Statistical analysis

Recorded information was examined using the Statistical Package for the Social Sciences, variant 23.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative information was represented as median±SD. Subjective information was represented as recurrence and rate.

3. Results

The following tables and statistics show the results of the current evaluation. We suggested using hysteroscopy and ultrasonography to evaluate the uterine cavity following a myomectomy in our evaluation. With the same consideration and rejection criteria, 50 patients from the short-term gynecological facility (Al-Hussien and Sayed Galal Hospital at Al-Azhar University) were included in this research (Table 1).

The age range among patients was 25–40, with median age of 28.27 ± 5.37 years. The BMI ranged from 22 to 33, with median BMI of 27.50 ± 4.23 (Table 2).

Table 1. Distribution of demographic data within the research group.

Demographic characteristics	Total ($N = 50$)
Age (years)	
Ranges	25–40
Median ± SD	28.27 ± 5.37
BMI	
Ranges	22–33
Median ± SD	27.50 ± 4.23

A total of 37 (74%) patients had primary infertility and 13 (26%) patients had secondary infertility (Table 3 and Fig. 1).

The average marriage lasted 8.07 ± 4.63 years, but it might have been as long as 13 years (Table 4).

The average number of prior abortions was 3 + 2, ranging from 0 to 5 (Table 5).

The patients' parities ranged from 0 to 3, with a median parity of 2 + 1 (Table 6).

Regarding fibroids, there was a highly significant relation ($P < 0.001$) between the conclusion of

Table 2. Distribution of infertility types within the research group.

Infertility type	*n* (%)
Primary	37 (74.0)
Secondary	13 (26.0)
Over all	50 (100.0)

Table 3. Marriage duration in 'years' is reported for the research group.

Marriage duration 'years'	Total ($N = 50$)
Ranging +	1.8–13
Median ± SD	8.07 ± 4.63

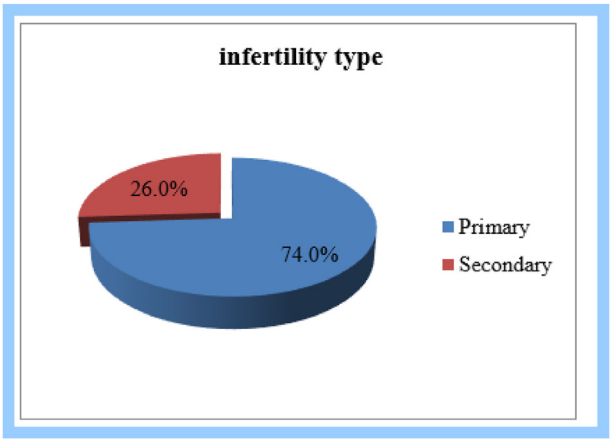

Fig. 1. Distribution of infertility types in a pie chart for the research group.

Table 4. Within the research group, the descriptive number of prior abortions.

Previous abortions number	Total ($N = 50$)
Ranging	0–5
Median±SD	3 ± 2

Table 5. Distribution of parity within the research group.

Parity	Total ($N = 50$)
Ranges	0–3
Median ± SD	2 ± 1

Table 6. Relationship between hysteroscopy and 4D ultrasound.

4D ultrasonography	Hysteroscopy [*n* (%)]				Total
	Fibroid	Polyp	IUA	Normal	
Fibroid	28 (56%	0	0	1 (2)	29
Polyp	0	5 (10)	0	1 (2)	6
IUA	0	0	1 (2)	0	1
Normal	2 (4)	3 (6)	1 (2)	8 (16)	14
Total	30 (60)	8 (16)	2 (4)	10 (20)	50
χ^2 test	73.196				
P value	<0.001				

uterine pathology by 4D ultrasound and the finding by hysteroscopy as conclusive determination (Table 7).

Table 8 demonstrated that 4D ultrasound had better accuracy values than 3D ultrasound, which was followed by 2D ultrasound, which had the lowest accuracy values across all borders (Figs. 2 and 3).

Table 7. In comparison to the gold standard hysteroscopic examination, the sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of both 2D ultrasound and 3D ultrasound and 4D ultrasound are determined.

Ultrasonography	Sensitivity	Specificity	PPV	NPV	Accuracy
2D U/S	75.0%	60.0%	88.2%	37.5%	72.0%
3D U/S	87.5%	80.0%	94.6%	61.5%	86.0%
4D U/S	90.0%	80.0%	94.7%	66.7%	88.0%

NPV, negative predictive value; PPV, positive predictive value; US, ultrasound.

Table 8. Draw a comparison between the various diagnostic techniques (2D, 3D, and 4D ultrasounds against hysteroscopy for fibroids).

Fibroids	Sensitivity	Specificity	PPV	NPV	Accuracy
2D U/S	86.2%	87.5%	96.2%	63.6%	86.5%
3D U/S	93.3%	88.9%	96.6%	80.0%	92.3%
4D U/S	96.7%	88.9%	96.7%	88.9%	94.9%

NPV, negative predictive value; PPV, positive predictive value; US, ultrasound.

4. Discussion

Expanding the uterine cavity with saline or another other medium may be necessary for the best imaging of the endometrium and myometrium in order to separate the uterine walls. X-beam hysterosalpingography is the only imaging modality for evaluating the uterus. Methods such as SHG, which entails expanding the uterine hole with liquid during transvaginal ultrasound, have a role in assessment of endometrial abnormalities.[6]

Actually, 3D ultrasound is enough for diagnosis of endometrial lesion rather than X-beam.[7]

This method permits synchronized detailed evaluation of the myometrium, endometrium, and uterine lesion.[8]

Transvaginal 3–4D ultrasound provides us with an additional coronal view so it used to assess endometrial abnormalities.[9]

In our analysis, the 2D ultrasound had an overall sensitivity of 86.2%, specificity of 87.5%, negative predictive value (NPV) of 63.6%, and positive predictive value (PPV) of 96.2%. 2D ultrasound had an overall accuracy of 86.5% when compared with 3D ultrasound, which has higher sensitivity (93.3%), specificity (88.9%), NPV (80%), and PPV (96.6%), but accuracy was lower (92%).

The overall 3D ultrasound sensitivity was 93.6%, with a specificity of 88.9%, an NPV of 80%, and a PPV of 96%. 3D ultrasound have an overall accuracy of 92.3%. This was less when compared with hysteroscopy, which had 100% sensitivity, 100% specificity, 100% NPV, 100% PPV, and 100% accuracy. This makes sense given that hysteroscopy provides a more accurate assessment of an intracavitary sore.

In our research, 2D ultrasound had 98.39% accuracy in identifying submucous fibroid and had 97.5% sensitivity, 100% specificity, 95.65% NPV, and 100% PPV. In contrast to 3D ultrasound, which showed 100% sensitivity, 100% specificity, 100% PPV, 100% NPV, and 100% accuracy in identifying submucous myomata, 2D SHG had 87.5% sensitivity, 100% specificity, 100% PPV, 81.48% NPV, and 91.94% accuracy.

With a specificity of 88.9%, 88.9% NPV, and 96.7% PPV, the overall sensitivity of 4D ultrasound was 96.7%. 4D ultrasound had an overall accuracy of 92.3%, being less accurate when compared with hysteroscopy, with 100% sensitivity, 100% specificity, 100% NPV, 100% PPV, and 100% accuracy. This makes sense given the greater accuracy of hysteroscopy in determining the severity of intracavitary pathology (submucous fibroids).

These outcomes are similar to the findings of Sylvestre et al.[10] One intrauterine sore was noted on

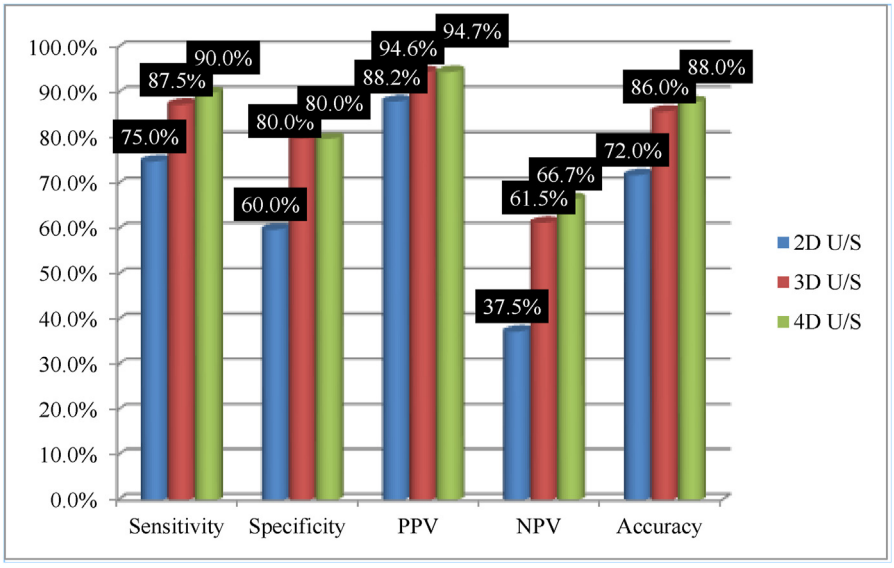

Fig. 2. Comparisons between the diagnostic performance of ultrasound and hysteroscopy are made.

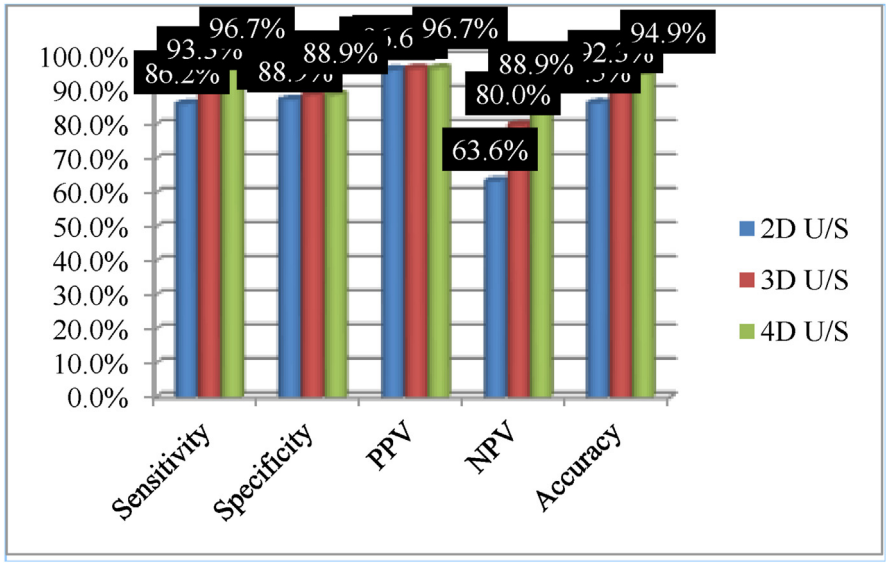

Fig. 3. Draw a comparison between the various diagnostic techniques (2D, 3D, and 4D ultrasounds against hysteroscopy for fibroids).

100 subfertile individuals during transvaginal two-layered sonography or hysterosalpingography. Saline mixture sonography exhibited a 98% awareness rate and a 95% PPV when used in combination with two-layered sonography separately in 60 patients who had hysteroscopy. The focus clearly demonstrates how simple differentiation tools may improve the specificity and accuracy of two-layered sonography. This was often due to uterine lesions, such as leiomyomas, being appropriately limited to intramural lesions rather than submucosal lesions.

Ayida and her companions considered standard two-layered and three-layered uterine pit examinations as well as two-layered checking using saline differentiation medium. In four out of 10 women, 2D examination found anomalies in their cavities (three had fibroids, and one had thick, hyperechoic endometrium). These were confirmed by 3D filtering, which also revealed an additional abnormality that resembled a uterine septum. Five out of 10 abnormalities were evaluated during the 2D examination with saline infusion (one with an endometrial polyp, three with fibroids, and one with a uterine septum).

These outcomes are equivalent to the results of Bartkowiak et al.,[11] who examined 23 patients, and

hysteroscopy revealed the existence of 16 endometrial polyps. The researchers compared two-layered sonography, routine imaging with and without saline differentiation, and three-layer sonography. A slightly unfavorable specificity of only 69.5% in a standard two-layered sonogram suggested the existence of polyps in 23 cases. Using two-layered sonography in conjunction with a saline solution increased this to 94.1%, with just 17 individuals later being identified as having polyps. With an specificity of 88.8%, three-layered sonography worked almost too well in identifying the presence of polyps in 18 individuals.

As regular saline cannot enter the uterine cavity when it is completely darkened, SHG, like HSG, is only useful in cases with fractional intrauterine grips. When transvaginal ultrasound results are average but there is still a lot of clinical uncertainty about IUAs, SHG is beneficial.[12]

Three-layered ultrasound is useful in diagnosis of intracavitary lesions and assurance of their area, which aids careful preparation. In the instances of connecting grips, the level of depression reduction is precisely evaluated. Additionally, this procedure is valuable for separation between little polyps and grips.[13]

In our review, the most reliable demonstrative and remedial device was hysteroscopy.

4.1. Conclusion

From our study, we could reason that hysteroscopy further enhances the results of 3–4D ultrasound imaging. It is not at present accessible in all units, and its utilization has critical ramifications regarding cost and preparing.

We really do prescribe 3–4D ultrasound if accessible to be performed regularly for all pathological lesions of the uterus, before laparoscopy and hysteroscopy to save the patient from doing any serious procedures, and before myomectomy to determine the exact site and size myoma.

All women with submucosal fibroids of types 0 and 1 should be provided gynecological myomectomy.

Conflict of interest

Hysteroscopy is considered the golden standard of diagnosis and treatment of the cavity of Uterine Myoma.

Acknowledgment

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