



## Study of the anatomical locations of uterine fibroids in Libyan women in Benghazi using transabdominal ultrasound

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### Keywords:

Anatomical locations  
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### ABSTRACT

**Introduction:** the uterus is a muscular organ with a thick wall located between the rectum and urinary bladder. uterine fibroids are most common growths develop either in or around the uterus. Also, they are considered as common gynecological tumors in women at reproductive age. However, its symptoms were affecting the Women's quality of life. **Aims:** The main aim of this study is to investigate the anatomical locations of uterine fibroids in Libyan women at Benghazi Medical Center (BMC) between Jan. 1st 2023 to Feb. 1st 2024. **Methods:** The current study included 200 patients of uterine fibroids of Libyan women in Benghazi confirmed after investigated at the BMC clinically and ultrasonographically. **Result:** Most of our population were symptomatic fibroids representing 73.8%. The highest frequency was observed in the 36 – 40 years age group. Intramural (34.9%), Submucosal-intramural -intramural (15.1%), and intramural-sub-serosal (21.4%) were the three most frequent anatomical locations of uterine fibroids. **Conclusion:** The present study found that the individual intramural uterine fibroids were the commonest type which produce menorrhagia as a common clinical presentation.

دراسة المواقع التشريحية للأورام الليفية الرحمية لدى النساء الليبيات في بنغازي باستخدام الموجات فوق الصوتية عبر البطن

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### الكلمات المفتاحية

المواقع التشريحية  
غزارة الطمث  
أورام الرحم الليفية

### الملخص

**المقدمة:** الرحم عضو عضلي ذو جدار سميك يقع بين المستقيم والمثانة البولية. أورام الرحم الليفية هي الأورام الأكثر شيوعاً التي تظهر داخل الرحم أو حوله. كما أنها تعتبر من الأورام النسائية الشائعة عند النساء في سن الإنجاب. إلا أن أعراضه كانت تؤثر على نوعية حياة المرأة. **الأهداف:** الهدف الرئيسي من هذه الدراسة هو دراسة المواقع التشريحية لأورام الرحم الليفية لدى النساء الليبيات في مركز بنغازي الطبي (BMC) في الفترة من 1 يناير 2023 إلى 1 فبراير 2024. **الطرق:** شملت الدراسة 200 حالة من حالات أورام الرحم الليفية لنساء ليبيات في بنغازي تم التأكد منها بعد فحصها في مركز BMC سريرياً وتصويرياً بالموجات فوق الصوتية. **النتيجة:** كان لدى معظم الحالات المدرجة في البحث أورام ليفية ذات أعراض تمثل 73.8%. ولوحظت أعلى نسبة حدوث بين الفئة العمرية 36 - 40 سنة. **المواقع التشريحية الأكثر شيوعاً** لأورام الرحم الليفية كانت داخل الجدار (34.9%)، وتحت الغشاء المخاطي داخل الجدار (15.1%)، وداخل الجدار تحت المصلي (21.4%). **الاستنتاج:** كشفت الدراسة الحالية أن أورام الرحم الليفية المفردة هي النوع الأكثر شيوعاً والذي يسبب غزارة الطمث كعرض سريري شائع.

### Introduction

Uterine fibroids, also known as leiomyomas /Myoma /Fibroleiomyoma /Fibromyoma, are non-cancerous mass (benign

uterine neoplasm), that occur in the uterine smooth muscle tissue. They are considered as a common gynecological condition that

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affects women all over the world especially women of middle and later reproductive age group and can cause various health problems such as heavy bleeding during menstrual cycle, pain in the pelvis, and sterility. In fact, fibroids in the uterus are one of the main reasons why hysterectomy is performed in many countries. They are muscular tumors (genetic mutation in the cells of smooth muscle) that develop within the uterine wall. <sup>(1)</sup>

Numerous features are present in uterine fibroids, such as changes in their size, shape in addition to their internal location within the uterus. They can manifest in different regions in respect to the uterine wall depth such as the interior uterine layer (submucosal), the outer surface (sub-serosal), within the uterine muscular wall (intramural), or attached to the uterus via a stalk-like structure (pedunculated). <sup>(2)</sup> They can also differ in number; there can be a single tumor or multiple tumors in uterus. Figure 1 illustrates uterine leiomyomas in an ultrasound image. <sup>(3)</sup> According to federation international of gynecology and obstetrics (FIGO classification) that is used by radiologists and it is classified as follows:

FIGO 0: pedunculated intracavitary (submucosal);

FIGO 1: submucosal and <50% intramural;

FIGO 2:  $\geq 50\%$  intramural;

FIGO 3: contacts endometrium, 100% intramural;

FIGO 4: 100% intramural;

FIGO 5: subserosal  $\geq 50\%$  intramural;

FIGO 6: subserosal <50% intramural;

FIGO 7: subserosal pedunculated;

FIGO 8: other (specify.e.g., cervical, parasitic). <sup>(4)</sup>

According to the size, fibroids can display considerable diversity. They can range from small, pea-sized growths to larger, round masses that measure more than 5 to 6 inches in diameter. As fibroids grow, they may result in distortion external and internal contours of the uterus. In certain instances, fibroids can expand extensively, filling the entire pelvic cavity or abdomen. <sup>(5)</sup>

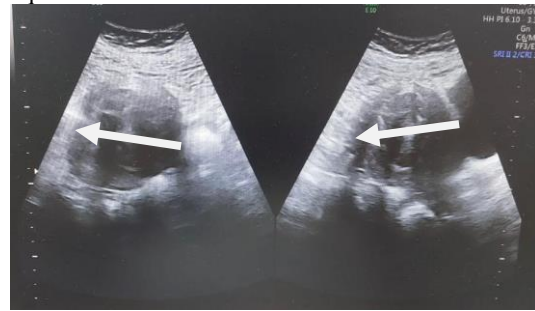
The number of uterine fibroids can also vary from case to case. Some individuals may only have a single fibroid, while others may experience the existence of multiple fibroids, each exhibiting different sizes. Noteworthy is the fact that fibroids can exhibit unpredictable growth patterns. They may remain small for an extended period and then suddenly undergo rapid enlargement, or they may gradually increase in size over a span of several years. <sup>(4)</sup>

The diverse characteristics and behaviors of fibroids highlight the complexity of this condition, making it imperative for healthcare professionals to thoroughly assess and monitor fibroid growth to provide appropriate treatment and management strategies. However, treatment planning is made easier with uterine tumor imaging. Nevertheless, there is currently no accurate imaging technique that can distinguish between smooth muscle benign and malignant tumors with certainty. <sup>(6)</sup>

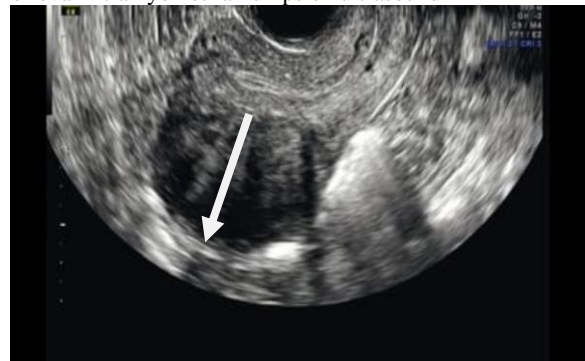
Despite being a common health issue with a significant impact on women's healthiness, the causes and development of fibroids are not well understood. Although certain risk factors such as age, obesity, hypertension, family history, and African-American race have been identified, the exact mechanisms by which they contribute to the development and growth of fibroids are not clear. <sup>(1)</sup> Proposed mechanisms include changes in hormone levels, growth factors, and components of the extracellular matrix <sup>(5)</sup>. According to Flake et al. (2003), the symptoms and progression of fibroids can vary greatly, ranging from no symptoms to severe symptoms that require medical intervention. Therefore, it is crucial to have a deeper comprehension of the radiological and clinical traits of uterine fibroids in order to guarantee a precise diagnosis and suitable treatment <sup>(6)</sup>.

The ultrasound technique is the first-line imaging modality for symptomatic patients with leiomyomas. They appear as uniform, iso/hypoechoic, well-defined, round or oval intramyometrial lumps on ultrasound (Figure 1). Owing to internal deterioration, they could be diverse. Calcifications can be visible centrally as an internal speckled pattern or peripherally as hyperechoic foci with acoustic shadowing. If a lipoleiomyoma is entirely composed of fat (due to adipose metaplasia), interior regions are considered hyperechogenic. <sup>(7)</sup> It might be essential to use additional imaging modalities to

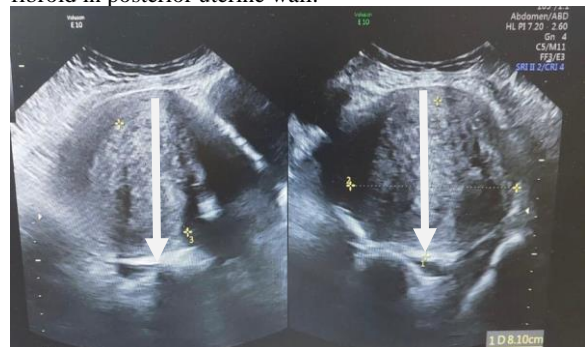
further characterize cystic degeneration, bleeding, or proteolytic liquefaction.



**Figure 1:** appears as uniform, iso/hypoechoic, well-defined, round or oval intramyometrial lumps on ultrasound



**Figure 2** is FIGO 6: subserosal. <50% intramural, Shows intramural fibroid in posterior uterine wall.



**Figure 2:** Shows intramural fibroid located uterine fundus.

#### Materials and Methods:

Transabdominal ultrasound was used in a hospital-based prospective study to locate the anatomical sites of uterine fibroids in Libyan women. All female patients who visited the Benghazi Medical Center's gynecology department were included in this study. The study included patients who were found to have uterine fibroids. Three diagnostic tools were utilized to gather data: the patients were examined in the gynecology department's outpatient clinic, they were interviewed using pre-made forms, and finally, at the radiology department in order to identify the numbers, and locations of the fibroids the transabdominal ultrasound images were done using the Power Vision 6000 Toshiba ultrasound machine, manufactured in Japan. It had a 3.5 MHz probe. The data was analyzed by Statistical Package for Social Sciences software (SPSS) version-16, descriptive statistics was used, the data were coded and transferred to a computer. The results presented tables and figures. Throughout the study period, all patients were kept informed about the procedures and goals of the research, and consents taken from the Patients.

The participants in the study provided written consent. The research received approval from the Benghazi Medical Center Ethics Committee.

#### Results:

In this study, 200 gynecological cases, selected at Benghazi Medical Center, were confirmed to have uterine fibroid by ultrasound screening. In table (1), the majority of patients fell into the 26-45 age group within the study population. The frequency of fibroids among individuals aged 36-40 is notably high, at 34%. This suggests that fibroids are uncommon among younger individuals and

decrease among both older and younger age groups. The following was the classification of fibroids based on symptoms; symptomatic fibroids represent 130 (65%) and it is the dominant compared to asymptomatic which scores 70 (35 %) as displayed in table (2).

**Table 1 shows the frequency distribution of patients by age.**

Age Group	Frequency	Percent
20 – 25	10	5%
26 -30	38	19%
31 -35	45	22,5%
36 -40	68	34%
41 – 45	29	14.5%
46 -50	7	3.5%
51 -55	3	1.5%
Total	200	100%

**Table 2 displays the frequency distribution of patients categorised by the symptoms of uterine fibroids.**

Classification	Frequency	Percent
Asymptomatic	70	35%
Symptomatic	130	65%
Total	200	100 %

Table 3 shows the frequency distribution of patients by number of fibroids mass: single 115 (57.5%) and multiple 85 (42.5%).

The commonest anatomical locations of fibroids are the intramural 65 (32.5%), and sub serosal 42 (21%). Table (4) displays the intramural + subserosal in multiple mass 42 (21%), followed by intramural 28 (14%). In a single fibroids mass of 53 (26.5%), the posterior location of fibroids predominated, with the anterior position coming in second at 19%. Table (5) indicates that the anterior + posterior position was the most common in 41 cases (20.5%) of multiple fibroids, with posterior + fundal 17 cases (8.5%) coming in second.

**Table 3: Patient frequency distribution based on the quantity of uterine fibroids.**

Mass	Frequency	%
Single	115	57.5 %
Multiple	85	42.5%
Total	200	100 %

**Table 4: Patients' frequency distribution based on the anatomical locations of their uterine fibroids**

Types	Frequency	%
Intramural	65	32.5%
Subserosal	42	21%
Submucosal	8	4%
Intramural – intramural	28	14%
intramural _subserosal	42	21%
Subserosal-Subserosal	10	5%
Subserosal+Submucal	5	2.5%
Total	200	100%

**Table 5 shows the frequency distribution of fibroids based on where in the uterine wall they are located.**

Position	Frequency	%
Anterior	38	19
Posterior	53	26.5%
Fundal	21	10.5%
Cervical	3	1.5%
Anterior + Posterior	41	20.5%
Anterior + Fundal	8	4%
Anterior + Cervical	1	0.5%
Anterior + Anterior	3	1.5%
Fundal + Fundal	2	1%
Posterior + Posterior	12	6%
Posterior + Fundal	17	8.5%
Posterior + Cervical	1	0.5%
Total	200	100%

**Discussion**

According to the results of the current study, the age range between (26-45) years had the highest incidence of people with uterine fibroids, followed by the age group between (36-40) years. Uterine fibroids are more common in the late reproductive era and vary in frequency with age. It has been reported that, Variations in study design led to variations in the disease's rate. (8) Additionally, this research demonstrated that the incidence grows gradually

before declining over a 50-year period, which is consistent with the findings of Mohammed et al.'s study. (9)

The current sample's individual uterine fibroids were found in the following anatomical locations: intramural (32.5%), subserosal (21%), and submucosal (8%), as shown in table (1). According to this study, the subserosal and intramural anatomical locations were the most common. These findings are consistent with those reported by Medikare et al., who said that these locations account for the majority (95%) of uterine fibroids. (10)

According to a study conducted in Sudan by Sid Ahmed, 40% of fibroids were detected in the fundal area, 40% throughout the body, and just 20% in the cervix. (11) The study reveals that the posterior location accounts for a higher percentage of fibroids, whereas the fundal position accounts for 10.5%, and the cervical position accounts for just 1.5%. While 57.5 percent of the study group had a single fibroid, 42.5% of the study population had multiple fibroids. Only 2% of fibroid tumours are solitary, while the bulk have multiples. (12) Although the cause for the high prevalence of single fibroids in the current study is unknown, these results are consistent with those of Mahmoud MZ et al., who reported that in their study conducted in Sudan, 8% of the total participants had single fibroids and just 2.7% had multiple fibroids. (13)

**Conclusion:**

The most common types of uterine fibroids affecting women in Libya are those located intramural anatomically in solitary masses. Uterine fibroids are most commonly found anatomically as a single mass (57.5%) intramural, followed by numerous masses (42.5%). The posterior position of fibroids (26.5%) was the most prevalent position with respect to their placement on the uterine wall, followed by the anterior position (19%). Considering that symptomatic fibroids account for 65% of the study group and are associated with several difficulties, clinical concerns should be addressed. Moreover, doing an early assessment will be protective. Additional research is required to examine the anatomical sites of fibroids using alternative diagnostic techniques, such as magnetic resonance imaging (MRI).

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Authors declare no conflicts of interest.

**Author contributions:**

Anisa Mana conceived and collected data; Amal Rahouma designed the study; generated, collected, assembled, analysed and interpreted the data; and Mustafa Karwad contribute in writing, editing, revising the manuscript. All authors drafted, revised, and approved the final version of this manuscript.

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