Section: Obstetrics and Gynaecology

Original Research Article

CLINICAL AND RADIOLOGICAL ASSOCIATIONS WITH ENDOMETRIAL FINDINGS IN FIBROID UTERUS

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ABSTRACT

Background: Uterine leiomyomas are the most common benign tumours of the female genital tract, often presenting with abnormal uterine bleeding, pelvic pressure, pain, and infertility, though many cases remain asymptomatic. Correlating clinical and radiological findings with endometrial histopathology is crucial for risk stratification and management.

Materials and Methods: A cross-sectional study was conducted over 18 months at a tertiary care hospital, including 200 women aged 20–49 years with ultrasound-confirmed fibroid uterus. Clinical details, radiological findings, and endometrial biopsy/histopathology results were analyzed. Statistical tests, including Chi-square and t-test, were applied, with $p< 0.05$ considered significant.

Results: The mean age was 41.7 ± 4.8 years. Comorbidities were present in 60% of patients, most commonly diabetes (38.3%) and anemia (32.5%). The leading symptoms were abdominal pain (67%), pressure symptoms (65%), and dysmenorrhea (60%). Radiologically, most fibroids measured 1–4 cm (59.9%), followed by 5–10 cm (33.5%) and >10 cm (6.6%). Uterine size on bimanual examination significantly correlated with fibroid size on imaging ($p< 0.05$). Medical management was effective in 55% of patients, particularly those with fibroids ≤4 cm, while larger fibroids (≥5 cm) frequently required surgical intervention, with histopathology confirming leiomyoma in 43.5% and adenomyosis in 0.5%.

Conclusion: Fibroid uterus was most prevalent in the perimenopausal age group, with pain and pressure symptoms as dominant complaints. Strong clinical–radiological correlation was observed, and fibroid size was a key determinant of management outcome. While smaller fibroids responded well to medical therapy, larger ones were significantly associated with surgical management. Endometrial biopsy remains essential to exclude atypical pathology, but clinical features and fibroid dimensions primarily guide treatment strategies.

Keywords: Fibroid uterus, leiomyoma, abnormal uterine bleeding, ultrasonography, endometrial biopsy, management outcome.

INTRODUCTION

Uterine leiomyomas are the most common benign tumours of the female genital tract, arising from the smooth muscle of the myometrium.[1-3] Their growth is predominantly hormone dependent, with estrogen and progesterone playing a key role in tumour proliferation.[4-6] The reported incidence is 70% in white women and above 80% in black women by age 50 . The risk is higher in women with early menarche, nulliparity, obesity, and family history of fibroids. In some studies, factors such as multiparity and smoking have been reported with lower incidence of the condition; however, cigarette smoking cannot be considered protective.[7-10]

Clinically, fibroids may present with abnormal uterine bleeding, pelvic pressure, pain, urinary symptoms, or infertility, though up to 50% of women remain asymptomatic.[3,11-12]Imaging

modalities such as ultrasonography and MRI are invaluable in the evaluation of fibroid uterus, with transvaginal sonography showing sensitivity of 90–99% in detection.[7,13] MRI provides additional information on size, vascularity, and relation to endometrium, though biopsy remains the gold standard for assessing endometrial pathology.[13-15] Correlating clinical and radiological findings with endometrial histopathology is essential to identify high-risk patients and guide management. This study was conducted to assess the clinical and radiological associations of fibroid uterus with endometrial biopsy findings, thereby contributing to a better understanding of the disease spectrum and its implications.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology in command hospital (Southern command) & Military hospital Khadki. The research was carried out over a period of 18 months following approval from the Institutional Ethics Committee.

Study Population and Sample Size

A total of 200 patients were included in the study. The study population comprised women attending the Gynaecology Outpatient Department (OPD) who were clinically diagnosed with abnormal uterine bleeding due to leiomyoma according to FIGO 2009 classification and subsequently confirmed by ultrasonography.

Inclusion and Exclusion Criteria

Women in the reproductive age group (20–49 years) with ultrasound-confirmed uterine leiomyoma, whether managed conservatively or surgically, were eligible for inclusion. Patients were excluded if they were younger than 20 years or older than 50 years, had abnormal uterine bleeding not attributable to leiomyoma, were unwilling to participate, or were receiving anti-cancer drugs such as Tamoxifen. Additional exclusion criteria included a family history of hereditary non-polyposis colorectal cancer (HNPCC) or familial carcinoma, postmenopausal status, pregnancy within the last three months, and fibroids located outside the uterus.

Clinical Evaluation

For each patient, demographic details such as age, parity, and menstrual history were documented. Presenting complaints, including menorrhagia, metrorrhagia, dysmenorrhea, infertility, and pelvic pain, were carefully recorded.

Radiological Evaluation

Ultrasonography, either transabdominal or transvaginal depending on clinical indication, was performed to confirm the diagnosis of leiomyoma. Radiological findings including fibroid number, size, and location were noted, along with endometrial thickness and pattern. Magnetic Resonance Imaging (MRI) results were reviewed in selected cases where available for additional assessment.

Endometrial Tissue Sampling

Endometrial samples were obtained from all study participants. In women managed conservatively, pretreatment endometrial biopsy was performed, while in those undergoing hysterectomy, histological evaluation of the resected uterus was carried out to assess the final endometrial findings.

Histopathological Processing

Collected specimens were fixed in 10% neutral buffered formalin, processed routinely, and embedded in paraffin wax. Sections of 4–5 µm thickness were prepared and stained with Hematoxylin and Eosin (H&E). Special stains were used whenever required. Microscopic evaluation was conducted to classify the histological patterns into categories such as proliferative, secretory, disordered proliferative, hyperplasia with or without atypia, atrophic changes, endometritis, malignant lesions (if present), or predominantly hemorrhagic/scanty tissue.

Statistical Analysis

The data were compiled in Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 26. Continuous variables were expressed as mean ± standard deviation (SD) or median, depending on data distribution, whereas categorical variables were summarized as frequencies and percentages. The Kolmogorov–Smirnov test was used to assess normality of data. Quantitative variables were compared between groups using the unpaired *t*-test or Mann–Whitney *U* test as applicable, while qualitative variables were analyzed using the Chi-square test or Fisher's exact test. A *p*-value of <0.05 was considered statistically significant.

RESULTS

In the present study, total of 200 patients fulfilling the inclusion criteria were included. The mean age of the study group was 41.74±4.8yrs.

Table 1: The mean age of patients

	Minimum	Maximum	Mean	SD
AGE(yrs)	28.0	51.0	41.74	4.85

Table 2: Presence of comorbidities among patients

Presence of Comorbidities	Frequency	Percent
Nil	80	40%
Yes	120	60%

Table 3: Types of comorbidities

Comorbidities	Frequency	Percent
DM	46	38.3%
Anemia	39	32.5%
Hypothyroidism	16	13.3%
Depression	2	1.6%
Hypertension	16	13.47%
HIV	1	0.83%

Among the study participants, 60% were associated with comorbidities, of which 38.3% were with diabetes, 32.5% with anaemia, 13.47% with hypertensionand 13.3% with hypothyroidism.

Table 4: Types of Symptoms

Symptoms		Frequency	Percentage
Pain abdomen	Yes	134	67%
	No	66	33%
Dysmenorrhea	Yes	120	60%
	No	80	40%
Frequent menstruation	Yes	82	41%
	No	118	59%
Intermenstrual bleeding	Yes	98	49%
	No	102	51%
Heavy menstrual bleeding	Yes	74	37%
	No	126	63%
Pressure symptoms	Yes	130	65%
	No	70	35%

Patients presented with overlapping symptoms. Most common symptom was pain abdomen in 67% and pressure symptoms in 65% followed by dysmenorrhea in 60%, frequent menstruation in 41%, intermenstrual bleeding in 49%, and heavy menstrual bleeding in 37%.

Table 5: Findings of bimanual examination [size of uterus corresponding to Period of gestation (POG)]

Bimanual examination (size of uterus corresponding to POG)	Count	N %
Normal	69	34.7%
6-8 weeks	69	34.7%
8-12 weeks	41	20.2%
>12 weeks	21	10.4%

On bimanual examination, the 34.7% showed the normal size uterus, 34.7% with size of 6-8 weeks, 20.2% with 8-12weeks size and 10.4% with more than 12 weeks of size.

Table 6: Radiological findings (size of fibroid in cm)

Radiology findings (size of fibroid in cm)	Count	N %
1-4 cm	120	59.9%
5-10 cm	67	33.5%
>10 cm	1	6.6%

Radiologically, study showed 59.9% lesions were 1-4cm, 33.5% with 5-10cm and 6.6% with more than 10cm size.

Table 7: Comparison of radiological findings with bimanual examination findings

Bimanual Examination (size if uterus corresponding to POG)	Radiology						Chi-square (p-value)
	1-4 cm		5-10 cm		>10 cm		
	Count	N %	Count	N %	Count	N %	
Normal size	54	54.0%	1	1.8%	0	0.0%	168.37 (0.01)*
<6 weeks	0	0.0%	0	0.0%	0	0.0%	
6-8 weeks	42	42.0%	16	28.6%	1	9.1%	
8-12 weeks	2	2.0%	33	58.9%	0	0.0%	
>12 Weeks	2	2.0%	6	10.7%	10	90.9%	

The study documented a significant correlation of the bimanual examination (size of uterus corresponding to weeks of POG) and the radiological findings (size of fibroid in cm). ($p<0.05$).

Table 8: Outcome after Management

Patient outcome after management		Count	N %
Surgical Management	Gross and HPE uterine and cervical findings (Surgical management)	87	43.5%
	Adenomyosis (Surgical management)	1	0.5%
Medical management	Asymptomatic (Medical management	19	9.5%
	Not relieved (Medical management)	2	1.0%
	Symptomatically better (Medical management)	91	45.5%

On surgical management (Hysterectomy or Myomectomy), gross and histopathological examination showed uterine leiomyomain 43.5% along with cervical findings of Nabothian cysts and/or inflammation. Adenomyotic uterus was noted in 1% patients. Significant proportion (55%)were satisfied with medical management (9.5% became asymptomatic and 45.5% responded well with partial resolution of symptoms). 1% of patients did not respond to medical management at all, for whom surgical management was considered.

Table 9: Treatment outcome in radiologically assessed fibroid uterus (size in cm)

Treatment outcome	Radiology (Fibroid size in cm)						Chi-square (p-value)
	1-4		5-10		>10		
	Count	N %	Count	N %	Count	N %	
Gross and HPE findings in uterus and cervix (surgical)	33	33.0%	48	85.8%	11	100.0%	55.16 (0.01)*
Adenomyosis (surgical)	0	0.0%	1	1.8%	0	0.0%	
Asymptomatic (medical)	12	12.0%	2	3.6%	0	0.0%	
Not Relieved (medical)	1	1.0%	0	0.0%	0	0.0%	
Symptomatically Better	54	54.0%	5	8.9%	0	0.0%	

The study documented management outcome in patients with radiologically assessed size of fibroid (in cm). The patients with 5-10 cm and more than 10cm lesion were found to have significant gross and histopathological finding after surgical management whereas patients with 1-4cm had the symptomatically better outcome on medical management. ($p<0.05$).

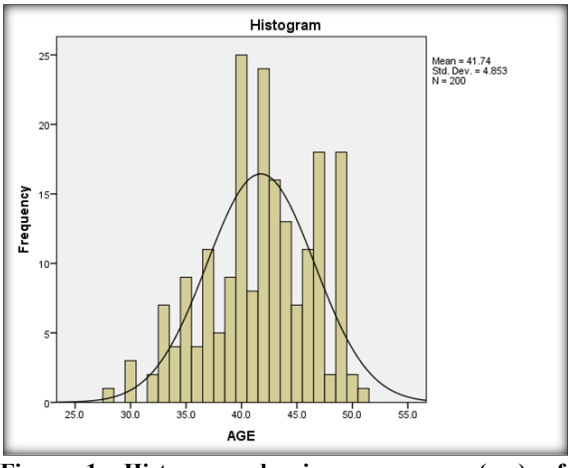

Figure 1: Histogram showing mean age (yrs) of patients

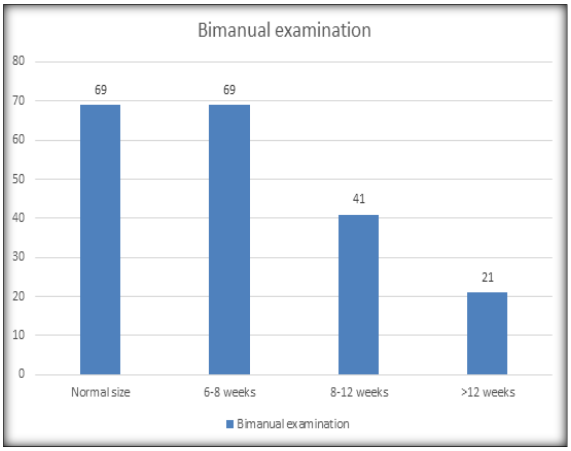

Figure 2: Findings of bimanual examination (uterine size corresponding to POG)

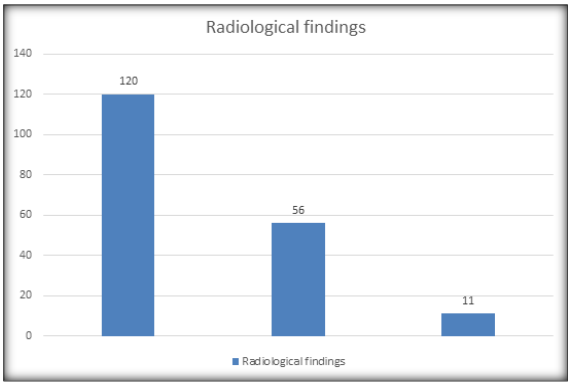

Figure 3: Radiological findings of fibroid uterus (size of fibroid in cm)

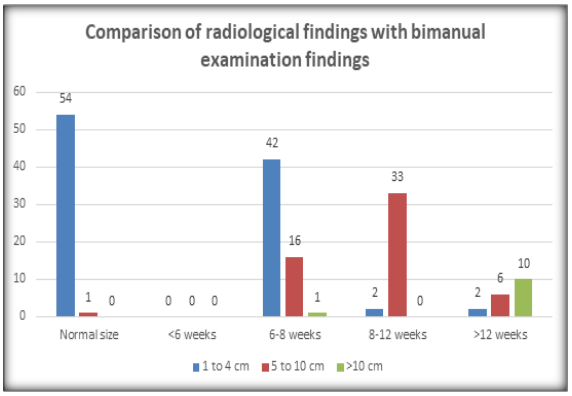

Figure 4: Comparison of radiological findings (fibroid size in cm) with bimanual examination (uterine height corresponding to period of gestation) findings

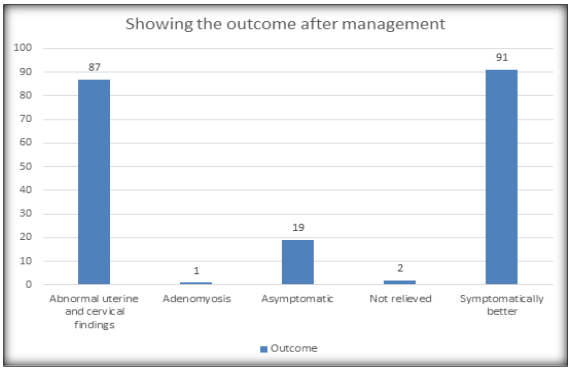

Figure 5: Outcome after management (medical/surgical)

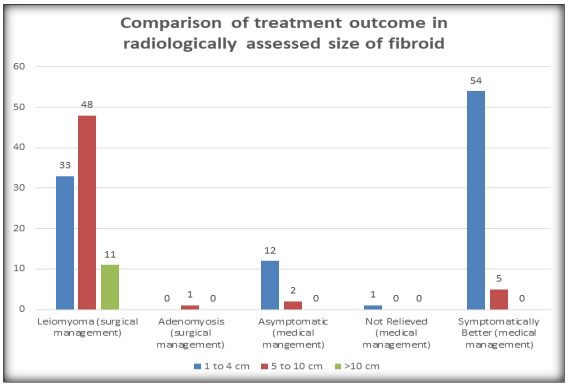

Figure 6: Comparison of treatment outcome in radiologically assessed size of fibroid uterus

DISCUSSION

Fibroid uterus presents with a wide spectrum of symptoms and clinical findings, which influence management decisions. In the present study, the mean age was 41.7 years, consistent with global data indicating peak incidence in the fourth and fifth decades of life.[16]

The majority of patients reported overlapping symptoms. Pain abdomen (67%), pressure symptoms (65%), and dysmenorrhea (60%) were the most frequent complaints, followed by intermenstrual bleeding (49%), frequent menstruation (41%), and heavy menstrual bleeding (37%). These findings are similar to reports by Giuliani E et al,[11] and Kaur et al,[17]who described menorrhagia and pressure symptoms as the dominant presentations in fibroid cases. The slightly higher rate of dysmenorrhea and pain abdomen in our study may be attributable to late presentation and larger fibroid sizes.

Comorbidities were present in 60% of patients, with diabetes (38.3%) and anemia (32.5%) being most common. This highlights the systemic burden of fibroid uterus, as chronic blood loss often contributes to anemia and metabolic disorders are prevalent in this age group.

On clinical and radiological examination, significant correlation was observed between uterine size on bimanual examination and fibroid size on imaging ($p < 0.05$). Most fibroids measured 1–4 cm (59.9%), followed by 5–10 cm (33.5%) and >10 cm (6.6%). The correlation of clinical and radiological findings reinforces the reliability of clinical examination, while confirming the role of imaging in accurate size assessment.

Management outcomes demonstrated that 55% of patients responded well to medical treatment, especially those with smaller fibroids (≤4 cm). Larger fibroids (≥5 cm) were strongly associated with surgical intervention, with hysterectomy or myomectomy specimens confirming leiomyoma in 43.5% and adenomyosis in 0.5% of cases. These findings are consistent with previous studies reporting that surgical management is more likely in larger and symptomatic fibroids, while medical therapy offers effective symptom control in smaller lesions.[17-19]

Our results therefore emphasize that treatment decisions in fibroid uterus should be individualized, taking into account fibroid size, symptom severity, and patient comorbidities. Endometrial biopsy adds diagnostic reassurance by ruling out atypical pathology, but the major determinants of treatment outcome remain clinical presentation and fibroid size.

CONCLUSION

Fibroid uterus in our cohort was most common in the perimenopausal age group, with pain abdomen,

pressure symptoms, and menstrual disturbances being the leading complaints. Clinical uterine size showed a strong correlation with radiological fibroid size, and treatment outcomes were strongly influenced by fibroid dimensions. Smaller fibroids (≤4 cm) responded well to medical management, whereas larger fibroids (≥5 cm) often required surgical intervention. Thus, while endometrial biopsy provides essential information to rule out concurrent endometrial pathology, clinical features, fibroid size, and symptom severity remain the key determinants in guiding management strategies

REFERENCES

1. Jaishree T, Sujatha R, Manjunatha YA. Histomorphological analysis of uterine and cervical lesions in hysterectomy specimens at a tertiary care hospital. IP J Diagnostic PatholOncol. 2019;4(1):72–7.
2. Kapur A, AngomchanuRst, Dey M. Efficacy of use of long-term, low-dose mifepristone for the treatment of fibroids. J ObstetGynecol India. 2016;66:494–8.
3. Barjon K, Mikhail LN. Uterine leiomyomata. 2019;
4. Okolo S. Incidence, aetiology and epidemiology of uterine fibroids. Best Pract Res ClinObstetGynaecol. 2008;22(4):571–88.
5. Townsend DE, Sparkes RS, Baluda MC, McClelland G. Unicellular histogenesis of uterine leiomyomas as determined by electrophoresis by glucose-6-phosphate dehydrogenase. Am J Obstet Gynecol. 1970;107(8):1168–73.
6. Benassayag C, Leroy MJ, Rigourd V, Robert B, Honoré JC, Mignot TM, et al. Estrogen receptors (ERalpha/ERbeta) in normal and pathological growth of the human myometrium: pregnancy and leiomyoma. Am J Physiol. 1999;276(6):E1112-8.
7. Nassr IA, Shakir AM, Falah DA, Rasheed MK. Exploring Multiparity's Influence on Uterine Fibroid Formation: A Cross-Sectional Study. AIMCJ. 2025;2(2):68-79
8. Kim JJ, Kurita T, Bulun SE. Progesterone action in endometrial cancer, endometriosis, uterine fibroids, and breast cancer. Endocr Rev. 2013;34(1):130–62.
9. Sabry M, Halder SK, Allah ASA, Roshdy E, Rajaratnam V, Al-Hendy A. Serum vitamin D3 level inversely correlates with uterine fibroid volume indifferent ethnic groups: a cross-sectional observational study. Int J Womens Health. 2013;5:93–100.
10. Purohit P, Vigneswaran K. Fibroids and Infertility. CurrObstetGynecol Rep. 2016;5:81–8.
11. Giuliani E, As-Sanie S, Marsh EE. Epidemiology and management of uterine fibroids. Int J Gynecol Obstet. 2020;149(1):3–9.
12. Divakar H. Asymptomatic uterine fibroids. Best Pract Res ClinObstetGynaecol. 2008;22(4):643–54.
13. Donnez J, Dolmans M-M. Uterine fibroid management: from the present to the future. Hum Reprod Update. 2016;22(6):665–86.
14. Benetti-Pinto CL, Rosa-E-Silva ACJ de S, Yela DA, SoaresJúnior JM. Abnormal Uterine Bleeding. Rev Bras Ginecol Obstet. 2017;39(7):358–68.
15. Marnach ML, Laughlin-Tommaso SK. Evaluation and Management of Abnormal Uterine Bleeding. Mayo Clin Proc. 2019;94(2):326–35.
16. Baird DD, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyoma in black and white women: ultrasound evidence. Am J Obstet Gynecol. 2003;188(1):100–7.
17. Kaur M, Gupta RK, Kaur SJ, Kaur P. Clinicopathological study of leiomyomas in hysterectomy specimens. Int J Reprod Contraception, Obstet Gynecol. 2018;7(4):1509–15.
18. Patil SG, Bhute SB, Inamdar SA, Acharya NS, Shrivastava DS. Role of diagnostic hysteroscopy in abnormal uterine bleeding and its histopathologic correlation. J GynecolEndosc Surg. 2009;1(2):98–102.
19. Vaidya S, Lakhey M, Vaidya S, Sharma PK, Hirachand S, Lama S, et al. Histopathological pattern of abnormal uterine bleeding in endometrial biopsies. Nepal Med Coll J. 2013;15(1):74–7.