



UTERINE LEIOMYOMAS AND ASSOCIATED DEGENERATIONS – A ONE YEAR STUDY

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ABSTRACT

Leiomyomas are the most common benign tumors seen clinically in 20-30% of women over 30 years of age and are hormone responsive. These tumors are found at different locations in the uterus and present with different clinical symptoms. Various degenerative changes are common in them.

Methods: This is a descriptive study conducted in the department of Pathology in NRI Institute of Medical Sciences, Sangivalasa to estimate the incidence of leiomyomas and associated degenerative changes along with pattern of endometrium and other associated pathologies of cervix and myometrium.

Results: Out of 82 hysterectomy specimens, 48 cases showed Leiomyomas. Leiomyomas were most common in multiparous women in the 41-50 years age group. Menorrhagia was the most common symptom seen in 33(68.75%) cases followed by dysmenorrhea in 7(14.58%) cases. 28(58.33%) cases showed multiple fibroids and 20(41.66%) showed single fibroids. The most common location was intramural with 38(79.16%) cases. 13 cases showed degenerative changes with the commonest degeneration being Hyaline degeneration in 8 (16.66%) cases. Cystic change was seen in 2 cases (4.16%), myxoid change in 2(4.16%) cases and calcareous change were seen in 1(2.08%) cases. The most common endometrial pattern was proliferative phase, seen in 24 cases (50%). The other uterine pathologies associated with leiomyoma were, chronic cervicitis in 30(62.5%) cases and adenomyosis, seen in 8(16.66%) cases.

Conclusion: Leiomyomas are the most common benign tumors of the myometrium. Degenerative changes occurring in them cause diagnostic difficulties which can only be confirmed histologically.

KEYWORDS : Benign tumor, uterus, degenerations, variants

INTRODUCTION:

The uterus is the principal organ of reproduction in the female genital tract. It is made up of the cervix, endometrium and myometrium covered by the serosa. The myometrium is made up of thick smooth muscle. Various tumors both malignant and benign occur in the myometrium. Leiomyomas are the most common benign tumors seen clinically in 20-30% of women over 30 years of age and are less common below 30 years.¹ Leiomyomas are hormone responsive, accounting for their presence in the reproductive age group and not before menarche. These tumors are variously termed as leiomyoma, myoma, fibroleiomyoma, leiomyofibroma and fibroids in literature. Matthew Baille first described myomas in 1793.²

The size of the leiomyomas varies from very small to huge dimensions. They are found at various locations in the uterus-Submucous, Intramural and Subserous. Two-thirds of the women have multiple leiomyomas.

Clinical presentation depends on size and location and they present as menorrhagia, dysmenorrhoea, lower abdominal pain, mass per abdomen, infertility and abortion.³ Classical leiomyomas are well circumscribed, firm, grey white bulging masses that can be easily separated from the surrounding myometrium. Cut section shows a whorled appearance. Microscopy shows smooth muscle cells arranged in interlacing fascicles. As the fibroids enlarge they outgrow their blood supply and this leads to various types of degenerations like hyaline, cystic, red, calcareous or

sarcomatous. This study is undertaken to evaluate histopathological features of leiomyoma, various degenerations seen and other pathologies associated with it.

MATERIALS AND METHODS:

This is a retrospective descriptive study undertaken in the department of pathology in NRI Institute of Medical Sciences, Sangivalasa in a period of one year from April 2021 to March 2022. The clinical and pathological data was collected from the records.

INCLUSION CRITERIA:

All hysterectomy specimens which showed fibroids were included.

EXCLUSION CRITERIA:

Specimens that did not include fibroids were excluded. The specimens received in the department of pathology after proper fixation in 10% formalin, were grossed and described in detail. Representative sections were given and processed using the automatic Histokinette. Blocks were made of the processed tissue and sections were cut and stained using hematoxylin and eosin.

RESULTS:

Of 82 hysterectomy specimens received in the department of pathology, there were 48 cases of leiomyoma. Leiomyomas were most common in the 41-50 years age group with 28 cases (58.33%) followed by 31-40 years age group with 15 cases (31.25%).

Table 1: Incidence of Leiomyoma based on age

Age Group	Number of cases	Percentage %
31-40	15	31.25%
41-50	28	58.33%
51-60	04	8.33%
>61	01	2.08%
TOTAL	48	100

Menorrhagia, dysmenorrhea, pain abdomen, polymenorrhea, mass per abdomen and back pain were the presenting symptoms. Menorrhagia was the most common symptom seen in 33(68.75%) cases followed by dysmenorrhea in 7(14.58%) cases.

Table 2: Chief complaints in patients with uterine leiomyoma

Chief complaints	Number of cases	Percentage
Menorrhagia	33	68.75%
Dysmenorrhoea	07	14.58%
Pain Abdomen	03	6.25%
Mass Per Abdomen	02	4.16%
Polymenorrhea	02	4.16%
Back Pain	01	2.08%
Total	48	100%

38 cases of leiomyomas were observed in multiparous women, 3 in nulliparous women and 7 cases in a primipara.

Out of 48 cases, 28(58.33%) cases showed multiple fibroids and 20(41.66%) showed single fibroids. The size of the fibroids ranged from 0.8cm to as large as 14x11x10cms. The most common location was intramural with 38(79.16%) cases, 3(6.25%) cases of subserosal fibroids and 6 (12.5%) cases showed both intramural and subserosal fibroids. One case showed submucosal, intramural and subserosal fibroids.

Table 3: Leiomyoma based on position (n= 48)

Position of leiomyoma	Number of cases	Percentage %
Intramural	38	79.16%
Subserosal	03	6.25%
Intramural+Submucous + Subserosal	01	2.08%
Intramural +Subserosal	06	12.5%
Total	48	100%

13 cases showed degenerative changes with the commonest degeneration being hyaline degeneration in 8(16.66%) cases. Cystic change was seen in 2 cases (4.16%), myxoid change in 2(4.16%) cases and calcareous change were seen in 1(2.08%) cases. All the cases with degenerative changes were seen in age group above 45 years except, one case in a 38-year-old.

Table 4: Degenerative changes in Leiomyomas (n=48)

Degenerative changes	Number of cases	Percentage %
Hyaline change	08	16.66%
Myxoid change	02	4.16%
Calcifications	01	2.08%
Cystic degeneration	02	4.16%
No Degeneration	35	72.91%

The most common endometrial pattern was proliferative phase, seen in 24 cases (50%) followed by secretory endometrium seen in 14 cases (29.1%).

Table 5: Histopathological pattern of endometrium in uterine leiomyoma(n=48)

Endometrial pattern	Number of cases	Percentage %
Proliferative Endometrium	24	50%
Secretory Endometrium	14	29.1%
Atrophic Endometrium	02	4.1%
Disordered Proliferative Endometrium	02	4.1%

Endometrial hyperplasia	03	6.25%
Endometrial Polyp	02	4.1%
Chronic endometritis	01	2.08%
Total cases	48	100%

The other uterine pathologies associated with Leiomyoma, were chronic cervicitis in 30(62.5%) cases, Adenomyosis, seen in 8(16.66%) cases, endocervical polyp in 3(6.25%) cases and 1(2.08%) case each of cervical and broad ligament fibroid.

Table 6: Various pathologies associated with leiomyoma

Uterine pathology	Number of cases	Percentage %
Chronic Cervicitis	30	62.5%
Adenomyosis	08	16.66%
Endocervical Polyps	03	6.25%
Cervical Fibroid	1	2.08%
Broad ligament fibroid	01	2.08%
No Pathology	05	10.41%
Total	48	100%

DISCUSSION:

Leiomyomas are the most common benign tumors arising in the uterus. It is one of the most common reasons for hysterectomy in hospitals. Typical leiomyomas are easily recognized on imaging, but atypical presentation caused by degenerative changes can cause diagnostic confusion.⁴As leiomyomas enlarge, they may outgrow their blood supply, resulting in various types of degenerations hyaline, myxomatous, cystic or red degeneration.

The most common age group showing uterine fibroids was 41-50 years in this study and similar to other studies done by Khan et al⁷, Saraf et al⁶, Vijayasankar et al⁷, Lahori et al⁸ and Gowri et al⁹. In a study done by Geethamala et al¹⁰ leiomyomas were more common in the 31 -50 years age group. In a study done by Kaushal et al¹¹ leiomyomas were found in the 50 – 60 years age group. Leiomyomas were more common in multiparous women compared with nulliparous women in different studies similar to that in our study.

Menorrhagia in 33 cases(68.75%) followed by dysmenorrhoea in 7 cases(14.58%)was the most common clinical presentation symptom in our study and in studies done by Khan et al⁵, Vijaya Sankar et al⁷,Kaushal et al¹¹with menorrhagia in 30%, 54.08% and 41.84% respectively and dysmenorrhoea in 19.16%, 41.84% and 18.3% respectively. Menorrhagia followed by pain abdomen were the most common clinical presentation in studies done by,Lahori et al⁸ and Gowri et al³and Geethamala et al¹⁰with menorrhagia in, 37.97%, 49.03%, 49.36%respectively followed by pain abdomen in 18.99%, 30.5% and 30.6%, respectively.

Intramural fibroids were the most common location in our study at 79.16%followed by subserosal at 6.25%. Intramural location was also the most common in various studies done by Khan et al⁵, Kaushal et al¹¹, Lahori et al⁸ Vijaya Sankar et al⁷ Gowri et al³with 67.50%,58.7%, 56.86%. 62.24% and 48% intramural leiomyomas respectively.

In our study one case of cervical fibroid and one broad ligament fibroid were seen. Cervical fibroids were seen in studies done by Saraf et al⁶ with one case and 5 cases in a study done by Gowri et al⁹. Broad ligament fibroids were seen in 3 cases in a study done by Gowri et al⁹

Single leiomyoma was more common than multiple leiomyomas in studies done by Khan et al⁵with 82.5%, Vijayasankar et al⁷with 86.73%), Lahori et al⁸with 56.96% and M Gowri et al⁹ with 71% but in our study multiple leiomyomas were more common with 58.33% and single leiomyoma at 41.66%.

Degenerative changes in leiomyomas occur due to

inadequate blood supply and depends on rapidity of growth and vascular insufficiency.⁷ Hyaline degeneration is the most common (63%) form of degeneration while the others occur less frequently, such as myxomatous changes (13%), calcification (8%), mucoid changes (6%), cystic degeneration (4%), red degeneration (3%), and fatty changes (3%).³(Table 7)

Table 7: Comparison of Degenerative changes seen in leiomyomas in various studies

Studies	Hyaline	Myxoid	Calcification	Cystic	Others*
Geethamala et al ¹⁰	160 (19.51%)	33 (4.03%)	8(0.98%)	41(5%)	21 (2,57%)
Kokila et al ¹²	44(6.34%)	4(0.62%)	12 (1.73%)	-	10 (1.43%)
Saraf et al ⁶	21(8.7%)	2(0.8%)	1(0.4%)	4(1.8%)	1(0.4%)
Gowri et al ⁹	44(16.9%)	4(1.6%)	1(0.4%)	9(3.5%)	3(1.2%)
Lahori et al ⁸	5(6.33%)	3(3.8%)	3(3.8%)	3(3.8%)	2(2.53%)
Kaushal et al ¹¹	22(20.2%)	4(3.7%)	2(1.8%)	5(4.6%)	1(0.9%)
Vijayasankar et al ⁷	29(29.9%)	19 (19.38%)	-	1 (1.02%)	8(8.16%)
Najma Khan et al ⁵	15(12.5%)	4(3.33%)	1(0.83%)	2 (1.66%)	-
Present Study	8(16.66%)	2(4.16%)	1(2.08%)	2 (4.16%)	-

*Other changes include red degeneration, Fatty change and hydropic change

Degenerative changes were seen in 13 cases in our study. Hyaline change was seen in 8(16.66%) cases in our study and was the most common degeneration similar to other studies. Hyaline change is not visible grossly but appears as eosinophilic bands extracellularly. (Fig 1&2)



Figure 1: Gross image of leiomyoma showing multiple fibroids with the largest one showing central degenerative change.

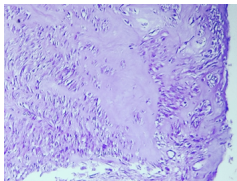


Figure 2: Microphotograph showing hyaline change with extracellular eosinophilic material on H&E (400 x)

Cystic degeneration was seen in 2 cases in our study. Hydropic degeneration is characterized by accumulation of oedema fluid with associated collagen deposition presenting with various patterns. Leiomyomas with hydropic change do not have thick smooth muscle cells fascicles but a delicate filigree pattern with oedema fluid as extracellular material. Cystic degeneration is a sequel of oedema with an incidence of 4%^{13,14}(Figure 3 & 4)



Figure 3: Gross image of uterus showing leiomyoma with area of cystic degeneration.

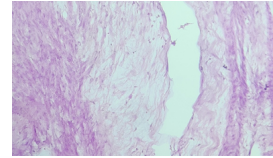


Figure 4: Microphotograph showing an area of edema and cystic degeneration on H&E 400x

Myxoid change was seen in 2 cases in our study and this is visible on gross examination by the presence of gelatinous intratumoral foci. Here fascicles of smooth muscle are separated by myxoid matrix. (Figure 5)

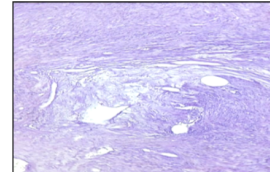


Figure 5: Microphotograph showing myxoid change in Leiomyoma on H&E 100x

We have encountered an interesting case of calcified fibroid. A 45-year-old nulliparous postmenopausal woman presented with pain at the lower abdomen for the past one year, stress urinary incontinence & altered bowel habits for the past 10 days. Pervaginal examination revealed palpable mass of 20 weeks size. On abdominal ultrasound, there was a large calcified mass measuring approximately 11 cms noted in the right iliac fossa.

MRI Imaging showed a large well encapsulated mixed intense lesion. So the radiological differential diagnosis was calcified adnexal tumor- dermoid cyst/fibroid.

Post hysterectomy we received a bulky and hard hysterectomy specimen measuring 15x13x7 cms. Our senior technician had to use bone saw to cut open the specimen. On cut surface an intramural circumscribed calcified tumor measuring 12x11x7 cms was noted along with a smaller fibroid of 2.5x1 cms. Endometrium and cervix were unremarkable. Representative bits were taken for processing after decalcification.

Calcified degeneration comprised 2.08% in our study and was relatively rare in other studies also with Kaushal et al with 2 cases (1.8%), Geethamala et al with 8cases (0.98%), Khan et al with 1case(0.8%), Lahori et al with 3 cases(3.8%) and Saraf et al with 1 case(0.4%).Calcified leiomyoma is more common in postmenopausal women.¹⁵⁻¹⁷Usually, leiomyomas regress after menopause because of lack of estrogen stimulation. However, it has been suggested that estrone, insulin-like growth factor, and epidermal growth factor stimulate the growth of leiomyoma in postmenopausal age group. With time the blood supply of the myoma might reduce, and the fibroid becomes ischemic. Calcium is first deposited in the peripheral region of the leiomyoma and as the degeneration changes progress, the leiomyoma may become totally calcified. When the entire leiomyoma is calcified it has been termed Womb Stone.¹⁷In our case, the entire fibroid was calcified accompanied by another small intramural fibroid. (Figure 6 &7)



Figure 6: Gross image of totally calcified large Leiomyoma and adjacent smaller one (arrow).

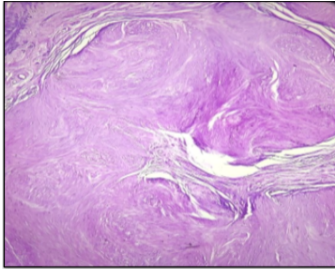


Figure7: Microphotograph showing basophilic staining in a calcified fibroid on H&E 100 x.

Such degenerations cause diagnostic difficulties radiologically and differential diagnosis include calcified adnexal tumor, Dermoid cyst with calcification, a large bladder calculi and rarely calcified parasite.^{4,15}

The most common endometrial pattern seen in our study was proliferative endometrium with 24(50%) cases concurrent with studies done by Khan et al⁵, Vijayasankar et al⁷, Kaushal et al¹¹, Geethamala et al, Gowri et al⁹ with 61.66%, 63.26% 70.6%. 50.7% and 46.3% cases of proliferative endometrium respectively. Secretory endometrium was seen in 14 cases (29.1%) in our study in comparison to studies done by Gowri et al (13.9%), Vijayasankar et al⁷ (21.43%), Geethamala et al¹⁰ (17.57%), Kaushal et al¹¹ (13.8%) and Khan et al⁵ (23.33%). Hyperplasia of endometrium was seen in 3(6.25%) cases in comparison to studies done by Gowri et al⁹ (22.8%), Geethamala et al¹⁰ (22.7%), Kaushal et al¹¹ (3.7%), Khan et al⁵ (2.5%). Atrophic endometrium was seen in 2(4.1%) cases in our study in comparison to the studies done by Khan et al⁵ (8.33%), Kaushal et al¹¹ (10.1%), Geethamala et al¹⁰ (3.79%), Gowri et al⁹ (5.1%). Atrophic endometrial changes are not only due to pressure effects but also due to postmenopausal hormone insufficiency. Disordered proliferative phase was seen in 2(4.1%) cases similar to a study done by Khan et al⁵ (4.16%). Chronic endometritis was seen in 1(2.08%) case and also seen in a study done by Gowri et al. Benign endometrial polyps were seen in 2 cases (4.1%).

The other uterine pathologies were chronic cervicitis and adenomyosis. Chronic cervicitis was seen in 62.5% cases in our study similar to studies done by Khan et al⁵, with 70.83%, Vijayasankar et al⁷ with 70.41% and Kaushal et al¹¹ with 77.1%. Adenomyosis was observed in 16.66% cases, similar to studies done by Vijayasankar et al⁷ with 17.35%, Geethamala et al³ with 29.1%, Kaushal et al¹¹ with 9.2% and Khan et al⁵ with 11.6%. Combination of these lesions is due to unopposed oestrogen and entrapment of glands within hypertrophied myometrium.⁹

CONCLUSION:

Leiomyomas are the most common benign tumor of the myometrium and common in the perimenopausal age group presenting with menorrhagia and dysmenorrhoea. Intramural leiomyoma is the most common location. Various degenerations occur in these tumors with hyaline degeneration being the commonest. Sometimes degenerations may cause diagnostic difficulties on imaging mimicking malignancy. Histopathological examination only can confirm a diagnosis.

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