

**LEIOMYOMAS IN HYSTERECTOMY SPECIMENS: A CLINICOHISTOPATHOLOGICAL STUDY**Shahida Riyaz<sup>1</sup>, Ila Sharma<sup>2</sup><sup>1</sup>Assistant Professor, Department of Pathology, Government Medical College, Kota, Rajasthan.<sup>2</sup>Assistant Professor, Department of Pathology, Government Medical College, Kota, Rajasthan.**ABSTRACT****BACKGROUND**

Uterine leiomyomas are the most common uterine neoplasms. They occur in as many as 75% of uteri. All women of reproductive age group are vulnerable and may experience clinical features like pain, abnormal uterine bleeding, abdominal mass and infertility or pregnancy complications, rendering knowledge of their pathogenesis and morphology essential. This study was undertaken to perform histopathological evaluation of leiomyomas.

**MATERIALS AND METHODS**

4223 hysterectomy specimens were examined for presence of leiomyomas and detailed histomorphological analysis was done for specimens with leiomyomas.

**RESULTS**

Leiomyomas were seen in 1590 (37.65%) specimens. Age of patients ranged from 22-80 years with most cases (54.53%) in 41-50 years age group and average age of 44.09 years. The most common clinical complaints were menorrhagia (45.97%), abdominal pain (18.99%), dysmenorrhea (11.95%) and abdominal mass (7.99%). Fibroid was unitary in 52.01% and multiple in 47.99% specimens. They were mostly located intramurally (80.25%). Degenerative changes like hyalinization (13.33%), hydropic degeneration (5.22%), myxoid change (2.14%), haemorrhage (1.01%), calcification (0.94%) and red degeneration were observed. Few cases of cellular, symplastic, neurilemmoma like and epithelioid variants, lipoleiomyoma, angioleiomyoma, mitotically active leiomyoma, dissecting leiomyoma and leiomyoma with hyaline globules were seen. One case was leiomyosarcoma on histopathology. Adenomyosis occurred concurrently with leiomyoma in 31.07% cases.

**CONCLUSION**

Leiomyomas are usually present intramurally. More than half occur singly. Secondary degenerative changes and occasionally variants of leiomyoma may be encountered. Cellular, mitotically active and symplastic variants need to be differentiated from leiomyosarcoma. Adenomyosis and leiomyoma are found to coexist frequently.

**KEYWORDS**

Hysterectomy, Histopathology, Leiomyoma, Fibroid.

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**BACKGROUND**

Uterine leiomyomas or fibroids are the most common uterine neoplasms, noted clinically in 20-30% of women over 30 years of age, but by conducting systematic search they may be found in as many as 75% of uteri.<sup>1,2</sup> Usually leiomyomas are tumours of reproductive age group, detected most commonly in middle aged women in perimenopausal period.<sup>3</sup> Their growth and maintenance is affected by hormonal milieu, suggested by the increased expression of oestrogen and progesterone receptors and occasional observation of increase in size during pregnancy and oestrogen therapy.<sup>4,5</sup> For the same reason, some leiomyomas appear to shrink after menopause.

Leiomyomas are usually asymptomatic. Clinical features most commonly seen are pain, abdominal mass and abnormal uterine bleeding depending on their size and location. They may lead to infertility or pregnancy complications like spontaneous abortion, premature rupture of membranes, dystocia and post-partum haemorrhage.<sup>6</sup> The spectrum and severity of symptoms often depends on the size, location, and number of tumours in the uterus. Diagnosis is usually by imaging.<sup>7</sup> Treatment is usually by myomectomy in younger females and hysterectomy in elderly.<sup>8</sup>

In hysterectomy specimen, they are seen grossly as spherical, firm masses, frequently multiple, with grey white cut surface showing whorled trabeculae. On microscopy, whorled anastomosing fascicles of uniform fusiform smooth muscle cells having blunt elongated nuclei with fine chromatin and indistinct cell borders are seen. Degenerative changes are common, manifesting as hyaline degeneration, hydropic change, mucoid degeneration or dystrophic calcification. Many subtypes of leiomyoma are identified, and they may mimic malignancy in the degree of cytologic

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atypia, mitotic index and relationship to surrounding normal structures. Adenomyosis and leiomyomas commonly coexist in the same uterus, simultaneous incidence reported in 15 and 57% cases.<sup>9</sup> This study was undertaken to perform histopathological evaluation of leiomyoma and its variants along with clinicopathological correlation.

**MATERIALS AND METHODS**

The present study was conducted retrospectively in the Department of Pathology, Government Medical College, Kota, Rajasthan, India by collecting relevant data of all hysterectomy specimens submitted in GMC Kota over a period of 3 years from January 2014 to December 2016. A total of 4223 hysterectomy specimens with or without salpingo-oophorectomy were subjected to examination, along with their clinical data.

On receipt of surgical specimen, they were fixed in 10% neutral buffered formalin for 24-48 hours. A detailed gross examination of the specimens was performed in which well circumscribed, grey to tan spherical lesions with whorled appearance was considered as fibroid and details related to its location, number, and secondary changes were noted. Multiple sections were taken from representative sites, processed and made into paraffin blocks from which slides stained with haematoxylin and eosin (H & E) were prepared. A detailed microscopic histopathological examination was undertaken. Histopathological changes in leiomyoma in terms of secondary changes, variants, cellularity, nuclear atypia, mitosis, and coagulative necrosis were studied. Diagnosis of adenomyosis was considered when endometrial gland and stroma were noted at least one low power field away from endomyometrial junction.

**RESULTS**

Four thousand two hundred and twenty-three hysterectomy specimens with or without salpingo-oophorectomy were analysed for presence of leiomyomas of which 1590 specimens (37.65%) had leiomyomas. Further evaluation was done for specimens which had leiomyomas. Out of these 1053 (66.23%) specimens were hysterectomy with bilateral adnexa, 357 (22.45%) were hysterectomy alone and 180 (11.32%) were hysterectomy with unilateral adnexa. Age of patients ranged from 22-80 years. Average age of patients at the time of hysterectomy was 44.09 years with most cases (54.53%) being in the age group of 41-50 years. The most common clinical complaint was menorrhagia (45.97%), followed by abdominal pain (18.99%), dysmenorrhea (11.95%) and abdominal mass (7.99%) while clinical data were unavailable for 15.09% cases. On gross examination, single fibroid was found in 52.01% specimens and more than one fibroid per uterus were seen in 47.99%. Most of these were located intramurally, 80.25% while 24.34% were subserosal and 4.27% were submucosal. Extrauterine locations were also observed though infrequently, with 13 (0.82%) cases of cervical fibroid and 2 (0.13%) cases of broad ligament fibroid (Figure 1a).



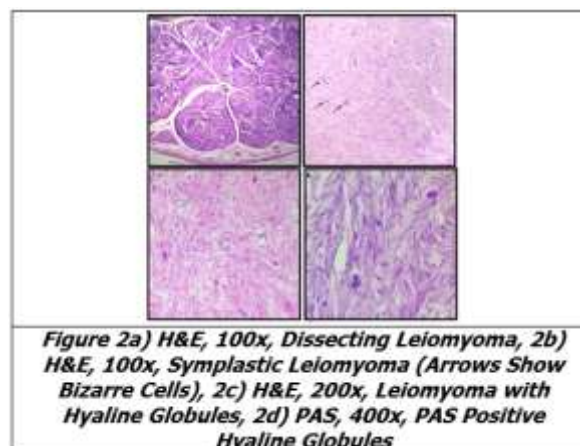
**Figure 1a) Gross Specimen Showing Broad Ligament Fibroid, 1b) Gross Specimen Showing Cut Surface of Cotyledonoid Dissecting Leiomyoma**

On microscopy, most leiomyomas resembled the typical appearance with whorled fascicles of uniform spindle cells with blunt ended bland nuclei. Degenerative changes such as hyaline degeneration was observed in 212 cases, hydropic or cystic degeneration in 83 cases, myxoid change in 34 cases, haemorrhage in 16 cases, calcification in 15 cases and red degeneration in 4 cases. (Table 1)

Secondary Changes	Number	Percentage
Absent	1356	85.28%
Hyaline Degeneration	212	13.33%
Hydropic Degeneration	83	5.22%
Myxoid Degeneration	34	2.14%
Haemorrhage	16	1.01%
Calcification	15	0.94%
Red Degeneration	4	0.25%

**Table 1. Secondary Changes in Leiomyoma**

Variants and abnormal forms of leiomyoma were seen in a few cases (Table 2), cellular leiomyoma being the most common with 18 cases. Symplastic leiomyomas (Figure 2b) were next in frequency with 7 cases while 4 cases of neurilemmoma like leiomyoma, 3 cases each of lipoleiomyoma and epithelioid leiomyoma, 2 cases of angioleiomyoma and 1 case each of mitotically active leiomyoma, dissecting leiomyoma (Figure 1b, 2a) and leiomyoma with hyaline globules (Figure 2c, 2d) were seen. One case excised as fibroid uterus was found to be Leiomyosarcoma on histopathology. Adenomyosis was observed concurrently with leiomyoma in 494 cases (31.07%).



**Figure 2a) H&E, 100x, Dissecting Leiomyoma, 2b) H&E, 100x, Symplastic Leiomyoma (Arrows Show Bizarre Cells), 2c) H&E, 200x, Leiomyoma with Hyaline Globules, 2d) PAS, 400x, PAS Positive Hyaline Globules**

Variant	Number	Percentage
Cellular Leiomyoma	18	1.13
Symplastic	7	0.44
Neurilemmoma Like (Palisaded)	4	0.25
Epithelioid Leiomyoma	3	0.19
Lipoleiomyoma	3	0.19
Angioleiomyoma	2	0.13
Dissecting Leiomyoma	1	0.06
Leiomyoma With Hyaline Globules	1	0.06
Mitotically Active Leiomyoma	1	0.06
Leiomyosarcoma	1	0.06

**Table 2. Variants and Abnormal Forms of Leiomyoma**

### Abbreviations and Symbols

et al - and others

WHO - World Health Organization

H&E - Haematoxylin and Eosin

PAS - Periodic Acid Schiff

### DISCUSSION

Leiomyomas are one of the most common pathologies found in uterus, with or without symptoms. In our study, 37.65% of uteri excised for any complaint had leiomyomas. Leiomyomas are common in women of reproductive age group. In our study age of patients ranged from 22-80 years with more than half the cases (54.53%) seen in perimenopausal age group of 41-50 years. Comparable incidence in this age group ranging from 46.5 to 61.84% was seen by Abraham and Saldanha,<sup>10</sup> Lahori et al,<sup>11</sup> Geethamala et al<sup>12</sup> and Kaur et al.<sup>13</sup>

The specimen obtained was most commonly uterocervix with bilateral adnexa (66.23%), while only uterocervix was obtained in 22.45% cases and uterocervix with one sided adnexa was excised in 11.32% cases. Comparable data was seen in study of Geethamala et al<sup>12</sup> with abdominal hysterectomies in 80.24% and vaginal hysterectomies in 19.76%.

Leiomyomas are mostly asymptomatic but when symptomatic, most common clinical manifestation is menorrhagia due to increased vascularity, endometrial surface and altered uterine contractility which was chief complaint in 45.97% cases in our study and studies of Geethamala et al<sup>12</sup> 49.36%, Kaur et al<sup>13</sup> 51.54%, Abraham and Saldanha<sup>10</sup> 40%. It is followed by pain abdomen possibly due to degenerative changes in leiomyomas, seen in 19.23% cases in our study, similar to Lahori et al.<sup>11</sup> In our study leiomyomas in uterus were singly seen in 52.01% uteri and multiple fibroids were seen in 48.99% uteri. Similar occurrence was also seen by Lahori et al<sup>11</sup> (56.96%), while Geethamala et al<sup>12</sup> had a higher incidence (70.9%) of unitary fibroids. Most of the fibroids were intramural fibroids (80.25%) as observed universally by other studies as well. In our study subserosal fibroids were 24.34% and submucosal fibroids were 4.27%. Extrauterine occurrence of cervical fibroids was seen in 0.82% cases while it was 2-8%

in similar studies by Dayal et al,<sup>14</sup> Kulkarni et al<sup>15</sup> and Geethamala et al.<sup>12</sup> Two cases in our study had broad ligament fibroids which can sometimes be confused with ovarian mass.

The degenerative changes in leiomyomas occur due to inadequate blood supply which may result in hyalinisation most commonly, followed by hydropic change, myxoid change, haemorrhage or calcification. In our study 234 (14.72%) cases showed secondary degenerative changes, of which hyaline degeneration was predominant (13.33%). Comparable results were seen by Geethamala et al (19.51%)<sup>12</sup> and Lahori et al (6.33%).<sup>11</sup> It was followed by hydropic degeneration (5.22%) similar to results obtained by Geethamala et al<sup>12</sup> and Lahori et al.<sup>11</sup> Other degenerative changes were myxoid degeneration (2.14%), haemorrhage (1.01%) and calcification (0.94%). Red degeneration occurs predominantly during pregnancy<sup>12,16,17</sup> and was found in 4 cases in our study (0.25%).

Dual pathology of adenomyosis and leiomyomas were noted in 31.07% of patients in present study similar to studies by Geethamala et al (29.1%),<sup>12</sup> Gowri et al (29%)<sup>18</sup> and Kaur et al (27.69%).<sup>13</sup> However studies by Lahori et al (19.23%)<sup>11</sup> and Kulkarni et al (16%)<sup>15</sup> show lower incidence. Coexistence of these lesions may be due to unopposed estrogenic stimulation.

Cellular leiomyomas are defined by WHO as leiomyomas having significantly high cellularity compared to surrounding myometrium. They lack tumour necrosis, atypia and mitotic figures.<sup>19</sup> Their incidence is usually <5%,<sup>1</sup> in the present study we encountered 18 cases (1.13%) of this entity.

Atypical/symplastic leiomyomas have bizarre hyperchromatic nuclei (moderate / severe atypia) and multinucleated tumour cells but no coagulative necrosis or increased mitotic activity.<sup>19</sup> In our study, 7 cases (0.44%) were found.

One case of mitotically active leiomyoma was observed in our study. Leiomyomas are defined as mitotically active when 5-15 mitoses are found per 10 HPF with mild to no atypia.<sup>1</sup> The above forms need to be differentiated from leiomyosarcoma. In present study, one case turned out to be leiomyosarcoma on microscopy.

Other variants include palisaded leiomyoma which is characterized by degree of nuclear palisading such as to simulate neurilemmoma,<sup>20</sup> we found 4 cases of this variant. Epithelioid leiomyoma with clear polygonal cells was seen in 3 cases.

Lipoleiomyoma contains an admixture of smooth muscle and adipose tissue. Their incidence ranges from 0.03-0.2%.<sup>10,21</sup> This is similar to incidence in our study accounting to 0.19%. In contrast, higher frequency of 0.7% was found by Abraham and Saldanha.<sup>10</sup>

A diagnosis of Angioleiomyoma was made in 2 cases. Cotyledonoid dissecting leiomyoma (CDL), also termed Sternberg tumour,<sup>22</sup> is a variant of uterine leiomyoma with distinctive grape-like gross appearance of an exophytic mass resembling placental tissue with about 43 reported cases in literature.<sup>23</sup> One case (0.06%) of this rare entity was found in our study.

Smooth surfaced hyaline globules are rarely found in leiomyomas and may represent multistep degenerative phenomenon affecting individual smooth muscle cells mostly in paucicellular GI leiomyomas.<sup>24</sup> Uterine leiomyoma with hyaline globules was seen in one case (0.06%) in our study.

### CONCLUSION

Leiomyomas are smooth muscle tumours most commonly seen in uterus, where they occur during reproductive years of female remaining mostly asymptomatic, but complaints like menorrhagia and pain abdomen can be experienced leading to surgical treatment by hysterectomy or myomectomy. We detected more than half to occur singly. They were present intramurally in 80.25% cases. Rarer forms like broad ligament fibroid were also seen, which can be confused for ovarian tumours. On microscopy, secondary degenerative changes, most commonly hyalinization, were found and occasionally variants of leiomyoma were seen. Cellular, mitotically active and symplastic variants need to be differentiated from leiomyosarcoma. Adenomyosis and leiomyoma were found to coexist in many cases.

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