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Uterine leiomyomas: a demographical and clinico-pathological exploration in a rustic setup of Tamil Nadu: a comprehensive study

Sankar R.[1], Kulandaivel A.[2], Krishnaswamy B.[3*], Viswanathan P.[4]

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[1] R. Gowri Sankar, Assistant Professor, Department of Pathology, Vinayaka Missions Kirupananda Variyar Medical College and Hospital, Salem, Tamil Nadu, India.

[2] Anbu Lenin Kulandaivel, Associate Professor, Department of Pathology, Vinayaka Missions Kirupananda Variyar Medical College and Hospital, Salem, Tamil Nadu, India.

[3*] B. Krishnaswamy, Professor and Head, Department of Pathology, Rajah Muthiah Medical College and Hospital, Chidambaram, Tamil Nadu, India.

[4] P. Viswanathan, Retired Professor, Department of Pathology, Rajah Muthiah Medical College and Hospital, Chidambaram, Tamil Nadu, India.

Aim: The aim of this study is to evaluate the prevalence of uterine leiomyomas in a rural setup of Tamil Nadu and also to analyse its plethora among the various neoplastic lesions of female genital tract as well as the various demographical and clinico-pathological spectrum of the same. **Material and Methods:** A twenty-five years retrospective study was conducted in the Department of Pathology in a rural teaching institute, Rajah Muthiah Medical College and Hospital, in Chidambaram. **Result:** 1200 cases were studied in the study period among the total two thousand and twenty-two female genital tract neoplastic lesions that were received in the department during the twenty-five-year period. The most common age group affected was 5th decade. The most common clinical presentation was menstrual disturbances among which menorrhagia was the commonest symptom. Taking into account the number of leiomyomas present in a uterus, single leiomyomas outnumbered multiple ones by a vast margin and taking the anatomical location of leiomyoma in a uterus into consideration, intramural leiomyoma stood well ahead of submucosal and subserosal leiomyomas.

Conclusion: Almost 2/3rd of the total female genital tract neoplastic lesions received from the inception of college to December 2012 were Uterine leiomyomas there by making it the most common neoplasm of female genital tract reported in our hospital in a rural setup for a total period of twenty five years starting from the inception of college until December 2012.

Keywords: Intramural, Leiomyoma, Menorrhagia, Voluminous study, Rural Tamil Nadu

Corresponding Author

B. Krishnaswamy, Professor and Head, Department of Pathology, Rajah Muthiah Medical College and Hospital, Chidambaram, Tamil Nadu, India.
Email: drbkrishnaswamy2014@gmail.com

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Introduction

Benign tumour of the muscular uterine wall is known by various names such as Leiomyomata/ myxoma/ fibroid [1]. Most of them are detected in middle aged women and are uncommon in women less than thirty years of age [2]. The overall incidence is between 4% and 11%, but it rises to nearly 40% in women over the age of fifty years. Clinically apparent lesions are less common in parous and premenstrual women [3].

The symptomatology may vary based on the location mainly [2]. It ranges from asymptomatic to various menstrual disturbances and even urinary difficulties. They are known to shrink after menopause and it is associated with fibrosis and reduction in individual tumour cells [4, 5]. The frequency does not decrease after menopause [2]. The normal myometrium of leiomyoma containing uterus expresses high level of oestrogen receptors, a fact that may be related to their pathogenesis [6]. The ovarian follicular hormone acts upon myometrium and results in cellular metaplasia with subsequent development of uterine fibroids [7].

Symptomatic leiomyomas need urgent attention by myomectomy in younger females whereas hysterectomy still remains the traditional modality of treatment [8, 9]. The intent of this voluminous study is to estimate the prevalence of uterine leiomyomas, among the hysterectomy specimens received in a rural population setup in the State of Tamil Nadu. This study also analyses the leiomyomas in context to various individual characteristics like age, location, number, clinical presentation as well as some combined parameters that include location and number, location and clinical presentation. To the best of the author's apprehension such an extensive study involving a rural population in the state have not been done previously. Hence it is being presented as an account of its rarity.

Material and Methods

Study place: The study is conducted in Department of Pathology, Rajah Muthiah Medical College and Hospital, Chidambaram.

Study type: This is a retrospective study.

Study duration: The study duration was for twenty-five years from January 1988 to December 2012.

Inclusion criteria: A total of 1200 hysterectomy specimens diagnosed clinically as uterine leiomyomas that were received in Department of Pathology.

Exclusion criteria: Hysterectomy specimens with other female genital tract conditions were excluded.

Study conduct: The study was a retrospective study from January 1988 to December 2012. The relevant clinical data were retrieved from histopathological requisition forms and clinical records.

Sample size: A total of 1200 hysterectomy specimens received in the Department of Pathology, Rajah Muthiah Medical College and Hospital were included.

All the specimens were fixed in 10% formalin and a detailed examination by two independent Pathologists was done with reference to number, location and combination of fibroids.

Statistical analysis: Data's were collected and analysed.

Results

A total of 1200 histopathologically proven leiomyoma cases were studied. In the above said period, a total of 2022 neoplastic lesions of female genital tract were received in the Department of Pathology, RMMCH. Majority were benign lesions (1419 cases, 70.2%) (Table-1). Leiomyoma was the most common benign tumor accounting for 84.6% among the benign lesions (Table-2) and 59.3% among all the neoplastic lesions.

Table-1: Total benign vs malignant lesions

Total number of female genital tract neoplastic lesions	Benign lesions	Malignant lesions
2022	1419 (70.2%)	603 (29.8%)

Table-2: Uterine Leiomyoma vs Other benign lesions

Total number of benign lesions	Uterine leiomyomas	Other benign lesions
1419	1200 (84.6%)	219 (15.4%)

The age group of the patients were divided into five groups and the highest incidence was found in the 5th decade followed closely by 4th decade (Table-3). The youngest and oldest patient was 19 and 75 years respectively.

In the present study 61% of the patients presented with menstrual disturbances with menorrhagia being the most common symptom.

Table-3: Leiomyomas: age distribution

Age in years	Total no. of cases	Percentage %
20 & below	01	0.08
21-30	84	7.00
31-40	518	43.20
41-50	530	44.20
51 & above	67	5.52

In the present study, majority were intramural leiomyoma (73.07%) followed by subserosal (14.75%) and submucosal (12.16) leiomyoma (Table-4). The five-year interval study showed a gradual decline in intramural leiomyoma while submucosal and subserosal were slightly increasing as the years passed by (Table-5).

Table-4: Fibroids - location

S. No	Type of leiomyoma	Total no. of cases	Percentage %
1	Intramural	877	73.09
2	Submucosal	146	12.16
3	Subserosal	177	14.75

Table-5: Fibroids - Location (5 Year Interval)

5-year period	Intramural		Submucosal		Subserosal	
	Total no. of cases	%	Total no. of cases	%	Total no. of cases	%
1987-1992	88	81.4	08	7.4	12	11.2
1993-1997	103	75.2	12	8.8	22	16
1998-2002	211	72.2	38	13.0	43	14.8
2003-2007	157	74.4	26	12.3	28	13.3
2008-2012	318	70.4	62	13.7	72	15.9

The present study showed 902 cases having only one leiomyoma while 298 cases were found to have more than one leiomyoma among which majority were within single anatomical location while some were seen in combination with other anatomical locations (Table-6). The most common combination seen was intramural with subserosal followed by intramural with submucosal. The number of leiomyomas in context to the location was shown in Table-7.

Table-6: Leiomyomas – solitary vs multiple

S. No	Number of fibroids	Total no. of cases	Percentage %
1	Single	902	75.20
2	Multiple	298	24.80

Table-7: Leiomyomas-location and number

	Single		Multiple	
	Total no. of cases	%	Total no. of cases	%
Intramural	633	72.2	244	27.8
Submucosal	127	87.0	19	13.0
Subserosal	142	80.2	35	19.8

Gross Images

Figure-1: Intramural leiomyoma

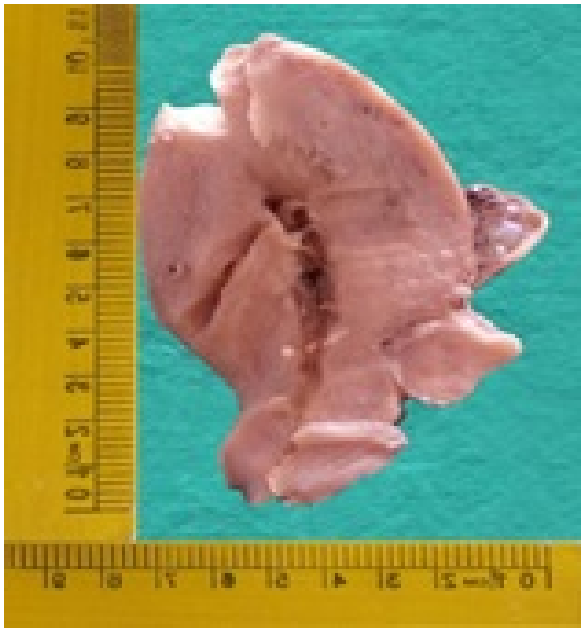

Figure-2: Subserosal leiomyoma

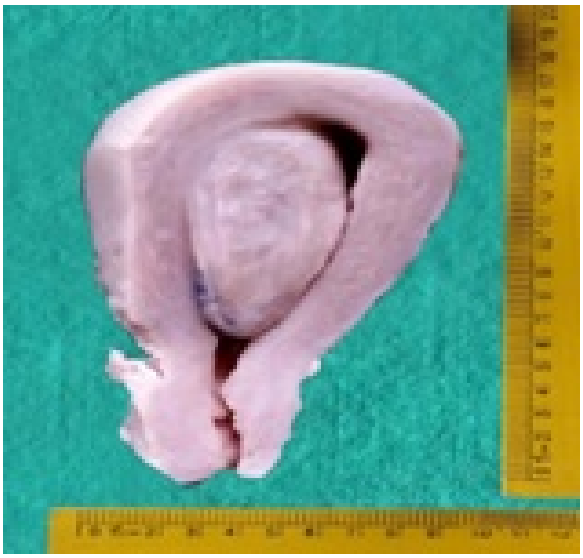

Figure-3: Submucosal leiomyoma

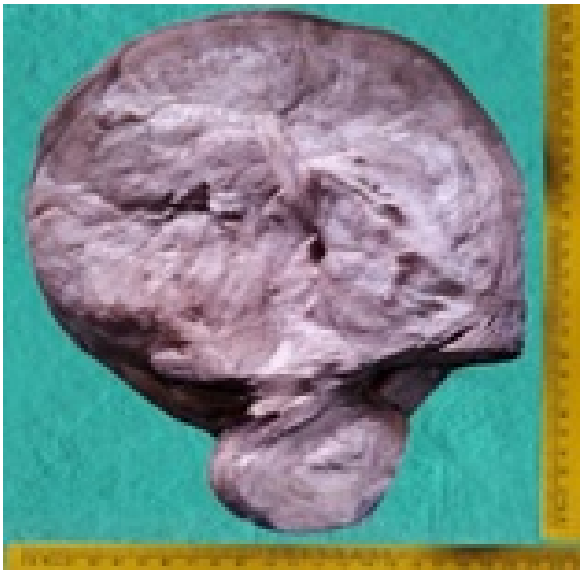

Figure-4: Intramural and Subserosal

Discussion

Hysterectomy, one of the major gynaecological surgery, was first performed in the year 1843 in England by Charles Clay [10]. Inspite of the availability of medical and conservative management, hysterectomy remains the second most frequently performed obstetric surgery after caesarean section in many parts of the world [11]. The commonest indication for hysterectomy is Leiomyoma [12]. Leiomyoma is a benign neoplasm composed of smooth muscle cells in a variable amount of fibrous stroma [13].

Leiomyomas are encountered frequently in multiparous women between third and fourth decades of life [14]. The National Institute of Environmental Health Sciences (NIEHS) uterine fibroid study provided data on the cumulative incidence of fibroids and documented that black women are more likely than white women to have uterine fibroids [15]. Inspite of Uterine Leiomyomas being highly prevalent and also having an enormous impact on the healthcare system and the economy, there is no effective medical treatment available to eliminate fibroids. This is due in part to the fact that very little is known about their pathophysiology [16]. Studies using glucose-6-phosphate dehydrogenase isoenzyme suggest that each apparently arise from a single cell within the myometrium [17]. Recent studies have confirmed that the different cell types contained in fibroids are all clonally derived from a parental cell with implied multipotent stem cell properties [18]. Although the initial event is believed to be smooth muscle cell proliferation, it is thought that a complex signalling system is also necessary. Thus, there are at least two components in the development of fibroids: the transformation of normal myocytes into abnormal myocytes and their growth into clinically apparent tumors [19]. Chromosome shattering and reassembly resembling chromothripsis (a single genomic event that results in focal losses and rearrangements in multiple genomic regions) is a major cause of chromosomal abnormalities in uterine leiomyomas.

There is also evidence that multiple separate tumors could be seeded from a single lineage of uterine leiomyoma cells [20]. The tendency of leiomyomata to arise during reproductive life, to grow during pregnancy, and to regress post-menopausally nevertheless implicates estrogen as one factor in the pathogenesis of the tumor [21]. Not only estrogen even progesterone seems to contribute a lot to promote the growth through increased proliferation of leiomyoma cells, increased deposition of extra cellular matrix and cell hypertrophy. Intriguingly, recent data have demonstrated that cells with stem cell-like properties are found within leiomyoma, and that these cells enhance estrogen plus progesterone-dependent growth of leiomyoma tumors [22]. Tumors from the same woman can grow at different rates and the growth rates are not influenced by tumor size, location, body mass index, or parity which shows that the size of the fibroid does not predict the growth rate.

Sometimes uterine fibroids can undergo spontaneous regression [23].

Fibroids increase in size during pregnancy and the maximum increase occur before the 10th week of gestation [24]. Submucosal leiomyomas are a possible cause of infertility and are highly amenable to surgical treatment and subsequent restoration of fertility [25]. In the present study the lesions were most commonly seen in 41-50 years age group (44.20%) which is comparable with studies by Rosario Pinto (44.7%), [26] Usha et al (48.95 %), [27] Ramesh (49.37) [28] and Mangala gowri [29] (Table-8). The most common clinical presentation in the present study was menstrual disturbances (61%) and its comparable with Poddar (55.9%), [30] Bhaskar Reddy (59%) [31] and Chhabra et al (63%) [32] (Table-9).

Table-8: Leiomyomas-age incidence.

Age	Rosario Pinto 1968	Usha Et Al. 1992	Ramesh 1999	Mangala Gowri	Present Study
20 & Below	-	-	-	-	0.08
21-30	14.92	10.53	10.50	4.6	7.00
31-40	44.7	48.95	49.37	41.3	43.20
41-50	41.3	37.95	34.08	49	44.20
51 & Above	4.6	3.09	06.06	5.1	5.52

Table-9: Leiomyomas - clinical presentation.

Symptoms	Poddar 1957	Bhaskar Reddy 1963	Chhabra Et Al 1993	Present Study
Menstrual Disturbances	55.9	59	63	61
Disharge Pv	10.0	9.5	13	06
Mass Abdomen	31.5	27.5	23	20
Pain Abdomen	32.5	25	-	11
Urinary Symptoms	-	-	10	02

The commonest location of fibroid in the present study was intramural (73.09) and it is comparable with Rosario Pinto (73.5%), Usha et al (77.17%) and Maitri (60%) [33] (Table-10).The number of leiomyomas occurring as a single mass was more common in the present study (75.29%) and it's comparable to Rosario Pinto (56.1%) and Mangala gowri (71.1%) (Table-11) but in contrast to a study by Begum S et al [34] whose study had majority of multiple leiomyomas. When present as multiple leiomyomas, most of them were located within a single anatomical location but some of them were present as a combination with Intramural and subserosal being the most common one in the Present study.

Limitations: As this study is a retrospective study starting from 1988, the complete details could not be retrieved as well as patients could not be followed up. Also, some of the slides and blocks were very old to take a good section that appears clear under a microscope as well as to be clicked by the camera.

Table-10: Leiomyoma - types

	Intramural	Submucosal	Subserosal
Rosario Pinto 1968	73.5	25.7	0.8
Usha Et Al. 1992	77.17	17.39	5.43
Maitri	60.6	9.1	5.1
Present Study	73.09	12.16	14.75

Table-11: Leiomyoma – solitary vs multiple

Number of Fibroids	Rosario Pinto	Mangala Gowri	Present Study
Single	56.1	71	75.20
Multiple	43.9	29	24.80

Conclusion

The incidence of leiomyoma was very high in the fourth decade and fifth decade which together contributed 1048 cases (87.40%) of the entire study population thereby indicating its common occurrence in late reproductive years and perimenopausal years. Thus, the epidemiological trend seems to be rather not changed a lot mainly in context to age group and incidence. The youngest and the oldest patient in this study were 19 and 75 years respectively.

Most common clinical presentation was menorrhagia and majority of them were intramurally located. Single leiomyomas outnumbered multiple ones by a vast margin and among multiple leiomyoma most of them were within single anatomical location. Although uterine leiomyomas are almost never associated with mortality, it still remains as one of the important causes of morbidity in women. Also, most of the cases may remain asymptomatic especially when they are small in size.

These are some of the challenges present before us especially in a rural setup like the present study population where females are the most neglected persons particularly with their illnesses rarely being given an attention. If uterine leiomyomas were detected in time and properly managed, extensive and complicated procedures and their adverse consequences could well be avoided.

Hence a large-scale study like this will help to know the demographical and clincopathological trends in the locality and thereby add to the existing volume of knowledge regarding uterine leiomyomas.

What does this study add to existing knowledge?

This extensive study casts light on the gamut of female genital tract neoplasms with special context to uterine leiomyomas presenting in a rural teaching hospital in Tamil Nadu. It also revealed how widespread the uterine leiomyomas were in the rural parts in and around the teaching institute.

Author's Contribution

Dr. Gowri Sankar Ramalingam: Contributed in collecting the data, compiling it and preparing the manuscript. **Dr. Anbu Lenin Kulandaivel:** Author helped in editing the manuscript and final review.

Dr. B. Krishnaswamy & **Dr. P. Viswanathan:** Authors contributed by helping in retrieving some data's and approving the final version. All the four authors read and approve the final version of the manuscript.

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