

The Incidence of Uterine Leiomyoma and Leiomyosarcoma at Tripoli Medical Center-Libya.

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ABSTRACT

Uterine fibroids (or leiomyomas), on the one hand, are common benign (noncancerous) smooth muscle tumors arise from the muscular part of the uterus and considered one of the major causes of abnormal uterine bleeding in women of reproductive age group even though the main reason is not yet known exactly. On the other hand, the leiomyosarcomas or LMS (cancerous), which are rapidly growing, are malignant tumors arise in post-menopausal women and often detected as an incidental finding in hysterectomy specimens. In this study, the incidence of uterine smooth muscle tumors (leiomyosarcoma and leiomyoma) in the Libyan woman and their distribution among the different age groups (from 11 to 80 years old), their type, location and the way of therapy was investigated. The study was conducted at Diagnostic Histopathology Laboratory in Tripoli Medical Center (TMC) Hospital, involving 1952 cases covering the period of twelve years (from January 2002 to December 2013).

The obtained results indicated that the leiomyoma cases were much higher than leiomyosarcoma cases, which represented 99.28% compared to 0.71%. Moreover, the prevalence of leiomyoma cases reached the top value on the year 2008 with 24.6%. Additionally, sharp increase in the incidence of leiomyoma cases was observed in the age group between 30 and 50 years old with more than 40%. Similarly, the highest number of leiomyosarcoma cases was detected in the median ages of women (from 30s to 50s) compared to the other age groups.

The obtained differences in the incidence trend of the analyzed cases and their different age/ year distributions are highly expected to reveal possible differences in their risk factors. Accordingly, additional investigations for the reasons behind such differences are required and recommended. This large variation in the incidence of occurrence of both types of uterine tumors and their sharp increase at a particular age group is not fully clear, however further investigation will be carried out based on this survey.

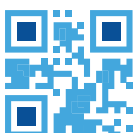
Keywords - Uterine fibroid; Leiomyoma; Leiomyosarcoma; hysterectomy specimens; post-menopausal.

INTRODUCTION

The terms uterine fibroids, myoma or leiomyoma are synonymous and classified as the most common benign tumors of the female reproductive tract with high prevalence value up to 70%. The peak incidences occur among women in their 40s and 50s.^{1,2} present as a mass with abnormal bleeding, in addition, it can often be multiple, with variation in size and located in the myometrium, subserosa, or submucosa. The main reason of such tumors is not clear yet, however, a vast variety of reasons and risk factors have been noticed and reported.^{1,3} Some hypotheses contribute this to genetic, diet or environmental factors. Another assumption indicated that hormones are the strongest factor; as it can be explained by the absence of leiomyoma in the teenage years compared to the menopausal age. Moreover, many studies have shown that estrogen hormone is considered as the major promoter of fibroid growth; nevertheless, other

hormones, such as progesterone can play a role in producing a high level of Transforming Growth Factor Beta (TGF- β).⁴

Different treatment options exist, ranging from simple monitoring or conservative therapy - where the fibroids have no obvious symptoms to medical and surgical therapy. Medical management is only used for a short-term therapy, whereas surgical treatment includes removal of fibroid from the wall of the uterus (myomectomy) or removal of a woman uterus (hysterectomy).⁵ Leiomyosarcoma, on the other hand, is a malignant change in a leiomyoma or uterine fibroid and basically originates from smooth muscle of the uterus. It is considered an infrequent and rare tumor in contrast to leiomyoma that accounts for 2% to 5% of all uterine malignancies.^{3,6} Leiomyosarcoma is more prevalent in relatively young patients aged 40–55 and carcinosarcoma appears at more advanced ages. Interestingly, many case reports have showed that the majority of incidences are at



the age of above 3 years old.³ Moreover, an epidemiological study by Yael Naaman et al. (2011) has revealed that sarcomas were more prevalent in women of Ashkenazi origin (50–70%) than in those of Sephardic descent (20–25%).² Similar results and foundation were reported by Schwartz et al. (1985).⁷ However, a previous study conducted by Arrastia et al. (1997) indicated that African-American origin is known to be a risk factor for sarcoma of different ages.⁸

In our research the age distribution for the study cases will be investigated, compared and discussed later in the discussion part. The treatment of such cases usually includes one of the following surgeries: adjuvant radiotherapy or chemotherapy.^{2, 3} The aim of the present study is screening and assessment of the incidence of fibroid tumors and sarcoma in Libyan women. The survey was conducted at Diagnostic Histopathology Laboratory in Tripoli Medical Center (TMC) Hospital. 1952 cases were analyzed covering the period from January 2002 to December 2013. The study was directed towards issues of prime importance; to identify the different percentage of leiomyoma and leiomyosarcoma, type and location of uterine fibroid tumor, patient's age, and the way of therapy.

MATERIALS AND METHODS

Fibroid tumors specimen (myomectomy and hysterectomy), which this study analysed, were processed and diagnosed at the Diagnostic Histopathology Laboratory in Tripoli Medical Center (TMC) Hospital, Tripoli - Libya. Gross examination and sections of the specimen into thin slices had been done in a hood. 10% of formalin (Neutral Buffered Formalin) was used as a fixative for all specimens.

Tissue Processing Machine was used to dehydrate the tissue by using ethanol alcohols. The processed tissue then embedded and blocked by using a hot paraplast (Bio-Optica), and subsequently the tissue blocks were cut into a thin section (from 1.5 to 3 μm) using a microtome machine (leica). Eventually, the thin sections were stained using Hematoxylin and Eosin (Bio-Optica) and examined under the microscope.

Data records for the total 1952 cases that confirmed uterine fibroid tumors were analysed in this study in order to identify the different percentages of leiomyoma

and leiomyosarcoma. The current research broadened its focus to encompass the analysis of histological reports, type of uterine fibroid tumor, patient's age, location of fibroid tumors in a uterine and the type of therapy.

RESULTS

In this study two fibroid tumors (leiomyoma and leiomyosarcoma) were analysed to determine the incidence of leiomyoma and leiomyosarcoma in patient's age. 1952 cases of fibroid tumors were collected from the Diagnostic Histopathology Laboratory at TMC in Libya and screened during the time period of 2002 to 2013. Data showed that the level cases of leiomyoma were greater than leiomyosarcoma during the twelve years of screening. Out of 1952 fibroid tumor cases; 1938 were diagnosed with leiomyoma and 14 other cases were diagnosed as having leiomyosarcoma, which represent 99.28% and 0.71 % respectively

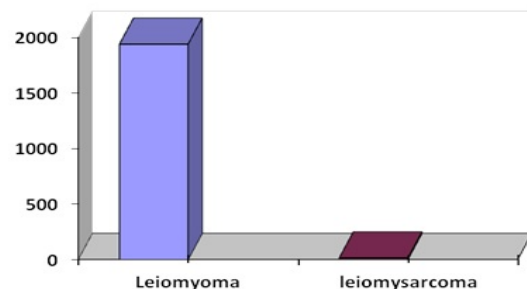


Figure 1: The total number of leiomyoma and leiomyosarcoma cases.

Additionally, the incidences increased steadily until reached the top value in 2008 and then started to decline. The highest number of leiomyoma cases (Figure 2) was in the years of 2008 and 2009 (with 245 cases and 232 cases respectively) which represented 24.61%, whereas the lowest number of such cases was in 2011 and 2013 (with 97 cases and 84 cases respectively) which represented 9.33%. The distribution of the leiomyoma cases during the analyzed years were as following: about 106 cases (5.46%) in 2002, 131 cases (6.75%) in 2003, 154 cases (7.94%) in 2004, 204 cases (10.52%) in 2005, 160 cases (8.25%) in 2006, 217 cases (11.19%) in 2007, 245 cases (12.65%) in 2008, 232 cases (11.97%) in 2009, 158 cases (8.15%) in 2010, 97 cases (5.0%) in 2011, 149 cases (7.68%) in 2012, and 84 cases (4.33%) in 2013 (Figure 2).

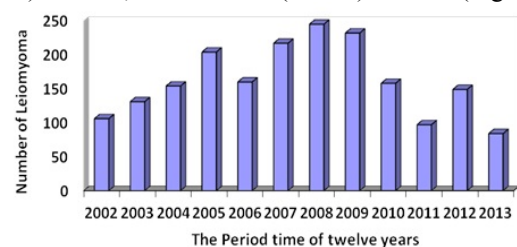
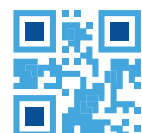


Figure 2: The number of leiomyoma cases during the analysed years (2002-2013).



As the data indicated, the incidence of leiomyoma increased gradually until it reached the top value of cases in 2008 and then started to decline. Moreover, the distribution of the leiomyoma cases of patients aged between 11 and 81 was studied (Figure 3). Only 3 cases (0.15%) of leiomyoma were diagnosed from 11 to 20 years old, while 177 cases (9.13%) were aged between 21 and 30, 820 cases (42.31%) between 31 and 40 years of age, 757 cases (39.06%) between 41 and 50 of age, and 146 cases (7.53%) were diagnosed between 51 and 60 years old. In an older age, ranging from 61 to 70 about 25 cases (1.28%) were diagnosed, 8 cases (0.41%) between 71 and 80, and only 2 cases (0.1%) at the age of 81 and above (Figure 3). The obtained data indicated that most cases of leiomyoma were diagnosed at the median age from 31 to 50, whereas leiomyomas are rare under the age of 20 and over 71. Thus, leiomyoma cases showed sharp increase in women between 30 and 50 years old.

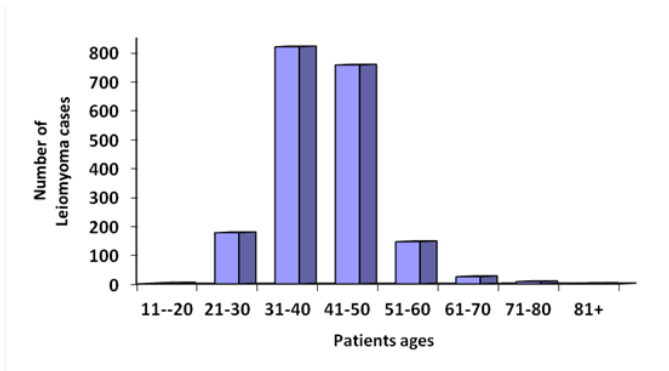


Figure 3: The distribution of patient age and number of leiomyoma cases.

When fibroid tumors detected in uterus, the most frequent operative technique used to treat this disorder is hysterectomy or myomectomy. The former is a surgical removal of the entire uterus and the latter is a surgical procedure in which individual fibroids are removed as discussed previously. This study revealed that the majority of patients had myomectomy to treat fibroid tumor;(1894 patients) in sharp contrast to 44 patients who had hysterectomy, which represented 97.72% and 2.27% respectively.

Additionally, location of fibroid tumors in uterus classifies leiomyomas into different types (Intramural leiomyomas, Submucous leiomyomas and Subserouse leiomyomas). Intramural leiomyomas located within the uterine wall, Submucous leiomyomas develop from myometrial cells just below the endometrium or located under the uterine mucosa, whereas Subserouse leiomyomas are located just under the uterine serosa or develop on the outer surface of the uterus and continue to grow outwards giving the uterus a knobby appearance. Most leiomyomas span more than one anatomic location and therefore, multiple leiomyomas are diagnosed as fibroid tumors. This study showed that the most cases of leiomyoma were multiple leiomyomas (244

cases) and the second highest leiomyoma cases were intramural leiomyomas (142 cases), whereas 64 cases were submucous leiomyomas and 28 cases were subserouse leiomyomas (Table 1).

Table 1: Number of leiomyoma cases with their locations.

Leiomyoma variants	Number of cases
multiple	244
intramural	142
submucous	64
subserouse	28

Upon screening the different variants of leiomyoma, the distributed cases were diagnosed as following: Cellular leiomyoma 58 cases, Red degeneration 19 cases, Bizarre .3 cases, Mitotically active leiomyoma 12 cases, Hydopic degeneration 2 cases, Angioleiomyoma 2 cases, Leiomyolipoma 2 cases, and Myxoid 1 case. The rest 1350 cases were diagnosed as leiomyoma and were not identified with one of the specific variants. In this study, leiomyosarcoma was also evaluated. As mentioned earlier, leiomyosarcoma is a malignant smooth muscle tumor of the uterus. Transformation of leiomyomas to leiomyosarcomas is extremely rare. Many researchers showed that leiomyosarcomas are found in approximately 0.1% of women with leiomyomas.⁹ According to the findings of the current study, out of 1952 fibroid tumor cases;1938 cases were leiomyomas and 14 cases were leiomyosarcomas during the twelve years from 2002 to 2013.

This large variation represented a high percentage reached to 99.28% and 0.71% for leiomyoma and leiomyosarcoma respectively. As mentioned and discussed above, most cases of leiomyoma were detected in women in their 31s and 50s. Similarly, leiomyosarcoma data also showed that the most cases of leiomyosarcomas were detected in women who were at the median age ranged from 31to 50 (Figure 4). Out of 14 cases of women with leiomyosarcomas, 4 cases of them were aged between 31 and 40, 6 cases were between 41 and 50 years old, 3 other cases of diagnosed LMS were at the age of 51 and 60, and only one case was detected in a woman aged between 61 and 70 (Figure 4). As presented in Figure 4, the highest number of cases with leiomyosarcoma was detected in women in their 30s and 50s. 4 LMS cases of women aged between 31 and 40, 6 other cases were from 41to 50 years old, and the age of 3 cases with LMS was ranged from 61 to 70.



The findings in Figure 4 also demonstrated no leiomyosarcoma cases neither of women aged between 11 and 30 nor of those at the age of 71 and over.

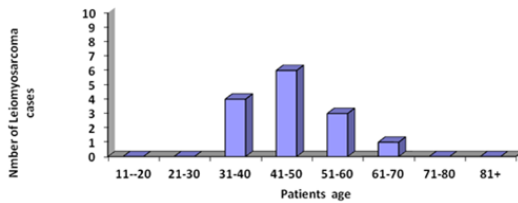


Figure 4: Distribution of the leiomyosarcoma cases in relation to patients' age.

DISCUSSION

As the results indicated, the incidence of uterine smooth muscle tumors - leiomyoma cases were much higher than the leiomyosarcoma ones in the studied Libyan women. The occurrence of leiomyoma reached the top value in 2008 with 24.6% compared to the other study period. Additionally, sharp increase in the incidence of leiomyoma was observed in the age group between 30 and 50 with more than 40% compared to the other age groups. The same trend was observed for leiomyosarcoma cases, where most of the cases detected were in the median-age women in their 30s and 50s. This large variation in the analysed cases and their different age and year distributions are not well known and most likely to be related to the possible differences in their risk factors. Consequently, supplementary exploration for the potential reasons behind such differences are required and recommended.

CONCLUSION

1952 cases of fibroid tumor were analysed and the cases were reported as leiomyoma with 99.28%, compared to leiomyosarcoma during the study period of twelve years. The highest percentage of leiomyoma cases was observed during the year of 2008. Interestingly, the age group between 30 and 50 showed the highest profile of all examined cases.

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