

Characterization of Fibroid Masses Using Computed Tomography

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Abstract: The objective of this study is to characterize the Fibroid masses by using Computed Tomography .Study depend on practical scanning, of 100 patients of uterine fibroid from different area in Khartoum state, with different age, distribution the data was collected of study found that the most common affected related age was between (29-39) years old (44) Patients 44% .Most common related clinical finding was uterine bleeding. In terms of the location of fibroids in the uterus, the intramural fibroids had the greatest percentage (67%), the subserosal was (16%) and the submucosal fibroids was (12%) Pedunculated and Interligamentous was very rare in Khartoum state which is that means the intramural fibroids are the most common type with a high incidence rate.

Keywords: Fibroid masses, fibroid type, uterus, computer tomography.

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I. Introduction

Fibroids are the most frequent seen tumors of the female reproductive system. Fibroids, also known as uterine myomas, leiomyomas, or fibromas are firm, compact tumors that are made of smooth muscle cells and fibrous connective tissue that develop in the uterus. It is estimated that between 20 to 50 percent of women of reproductive age have fibroids, although not all are diagnosed. Some estimates state that up to 30 to 77 % of women will develop fibroids sometime during their childbearing years, although only about one-third of these fibroids are large enough to be detected by a health care provider during a physical examination. In more than 99 percent of fibroid cases, the tumors are benign (non-cancerous). Leiomyomas occur in 20% to 30% of premenopausal women. In the USA it is known that women of African descent more often have fibroids with an earlier onset, bigger tumors and earlier symptoms than caucasian or Asian women [2] Symptoms will depend on the number of tumors you have as well as their location and size. For instance, submucosal fibroids may cause heavy menstrual bleeding and trouble conceiving, heavy bleeding between or during your periods that includes blood clots, pain in the pelvis or lower back, increased menstrual cramping, increased urination, pain during intercourse, menstruation that lasts longer than usual, pressure or fullness in your lower abdomen, swelling or enlargement of the abdomen [3] and will depend on the number of tumors you have as well as their location and size [4]. These tumors are not associated with cancer and do not increase a woman's risk for uterine cancer. They may range in size, from the size of a pea to the size of a softball or small grapefruit. Women are at greater risk for developing fibroids if they have one or more of the following risk factors pregnancy, a family history of fibroids, age of 30 or older, a high body weight. Uterine fibroids grow under the influence of the hormone estrogen and are most often seen after the menarche, and tend to shrink after the menopause. Typically the patient is nulliparous or of low parity and they are more commonly seen in women of African ancestry [5] The estrogen receptors are present in the myomatous (fibroid) tissue, at a greater extent than in normal myometrium, as well as in the case of progesterone receptors the action favoring the development of myomas by estrogen is demonstrated by the absence of myomas before puberty and by the significant reduction in volume with menopause almost constantly [6]

Computer tomography characteristics of uterine fibroid:

CT is not the investigation of choice for the characterization of pelvic masses. Uterine fibroids are often seen incidentally on CT scans performed for other reasons. The typical finding is a bulky, irregular uterus or a mass in continuity with the uterus. Degenerate fibroids may appear complex and contain areas of fluid attenuation. Calcification is seen in approximately 4% of fibroids and is typically dense and amorphous. However, calcification can also be confined to the periphery of the fibroid, when it is thought to be secondary to thrombosed veins from previous red degeneration [7]. Uterine Enlargement with Contour Deformity an enlarged uterus and a deformed uterine contour are the most common CT findings of leiomyomas. Leiomyomas usually

have a uniformly solid consistency, with attenuation values similar to those of uninvolved uterus. Although uterine enlargement may be a prominent feature, minimal uterine enlargement is difficult to diagnose with CT therefore uterine size alone is not a useful criterion for the differential diagnosis of leiomyoma. Alterations in contour or lobulations are identified more often in the uterine fundus; however, such changes may be seen in the body or in the lower segment of the uterus. Leiomyomas can also occur as an intracavitary mass obliterating the uterine cavity. Leiomyomas can be small or giant homogeneous or inhomogeneous, pelvic or abdomen pelvic masses [8].

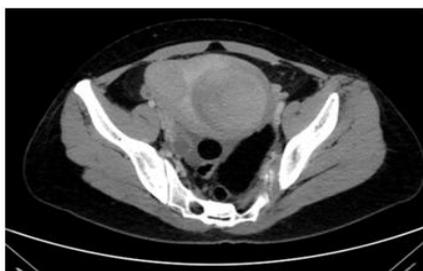


Figure 1: Axial CT scan of pelvic shows bulky uterus with two intramural fibroid (9x7.5cm) with heterogeneous enhancement



Figure2: Axial CT scan of pelvic shows intramural fibroid (6.0x5.2cm) with enlarge uterus

II. Materials and Methods

Material:Equipment: Data collection sheets. Two computer tomography machines of complete capabilities (GE optima 16 slice – 120-140 Kvp, 350 Mas, Toshiba 16 slice with – 120 Kvp, 350 Mas, Philips 64 slice with – 120 Kvp, 350 Mas)

Method:The study done during the period from 8 Saturday September 2018 to 31Thursday January 2019.The design used in this study was a descriptive analytical cross-sectional study.

Inclusion criteria in the case: Sudanese female patients underwent CT pelvis for evaluation of fibroid masses.

Exclusion criteria in the case: Patients who are not Sudanese, not in the determined period or in other hospitals Sudan.

Sample size and type: The data of this study collected from the 100 objects, of them was selected from CT pelvic images with patient who only have fibroid masses, the case included patient's age (18 – 60) years old.

Methods of data collection and technique: Using the data collecting sheet to collect the data

Variables of data collection: The data of this study collected using the following variables: Patient gender, History of disease, Sign and symptoms and demographic characteristic.

Methods of data analysis:The data analyzed using SPSS program.

Ethical approval:Ethical approval has been granted from the hospital and the department of radiology this did not include or disclose any [ID] information concerning the patient. Informed consent was obtained from all individual participants; included in the study.

III. Result

Table1: The frequency distribution of the age groups in Fibroid masses the majority was between 29-39 years

Age group	Frequency	Percent
18-28 years	24	24%
29 – 39 years	44	44%
40 – 50 years	22	22%
Above 50 years	10	10%
Total	100	100.0

Table2: Distribution of marital state among testing group

State	Frequency	Percent
Married	72	72%
Single	28	28%
Total	100	100.0

Table3: Distribution of body mass index among testing group

BMI	Frequency	Percent
Normal	23	23%
Obese	50	50%

over weight	27	27%
Total	100	100.0

Table4: Distribution vaginal bleeding among testing group

Groups	Frequency	Percent
No	28	28%
Yes	72	72%
Total	100	100.0

Table5: Distribution of Uterine size among testing group

Groups	Frequency	Percent
Enlarge	86	86%
Normal	14	14%
Total	100	100.0

Table6: Distribution of Fibroid type among testing group

Groups	Frequency	Percent
cervical fibroids	5	5%
Intramural fibroids	67	67%
Sub mucosal fibroids	12	12%
Sub serosal fibroids	16	16%
Total	100	100.0

Table7: Distribution Sizes of Fibroid with weight

	Weight	number size of fibroid (cm)
Mean	74.49	4.74
Mode	60	4
Std. Deviation	13.86	1.15
Minimum	52	3
Maximum	148	9.7
Total	100	100.0

Table8: Correlation between number size of Fibroid and size of uterus

			size of uterus		Total
			Enlarge	normal	
Number	Small	Count	54	10	64
		% within number	84.4%	15.6%	100.0%
	middle	Count	30	3	33
		% within number	90.9%	9.1%	100.0%
	Large	Count	2	1	3
		% within number	66.7%	33.3%	100.0%
Total	Count	86	14	100	
	% within number	86.0%	14.0%	100.0%	

Chi-Square = 1.732a P value = .421

Table9: Correlation between size of uterus and vaginal bleeding

			Vaginal bleeding		Total
			No	yes	
size of uterus	enlarge	Count	24	62	86
		%	27.9%	72.1%	100.0%
	normal	Count	4	10	14
		%	28.6%	71.4%	100.0%
Total	Count	28	72	100	
	%	28.0%	72.0%	100.0%	

Chi-Square =.003a P value = .959

Table10: Correlation between size of uterus and type of Fibroid

			type of Fibroid according to its location				Total
			cervical fibroids	intramural fibroids	Sub mucosal fibroids	Subserosal fibroids	
size of uterus	Enlarge	Count	5	53	12	16	86
		%	5.8%	61.6%	14.0%	18.6%	100.0%
	Normal	Count	0	14	0	0	14
		%	0.0%	100.0%	0.0%	0.0%	100.0%
Total		Count	5	67	12	16	100
		%	5.0%	67.0%	12.0%	16.0%	100.0%

Chi-Square =8.018a P value = .046*

Table11:Correlation between type of Fibroid and age

			Age				Total
			1.00	2.00	3.00	4.00	
type of fibroid according to its location	cervical fibroids	Count	1	1	2	1	5
		%	20.0%	20.0%	40.0%	20.0%	100.0%
	intramural fibroids	Count	16	32	13	6	67
		%	23.9%	47.8%	19.4%	9.0%	100.0%
	Sub mucosal fibroids	Count	2	6	3	1	12
		%	16.7%	50.0%	25.0%	8.3%	100.0%
	Subserosal fibroids	Count	5	5	4	2	16
		%	31.3%	31.3%	25.0%	12.5%	100.0%
Total		Count	24	44	22	10	100
		%	24.0%	44.0%	22.0%	10.0%	100.0%

Table12: Correlation between types of Fibroid and vaginal bleeding

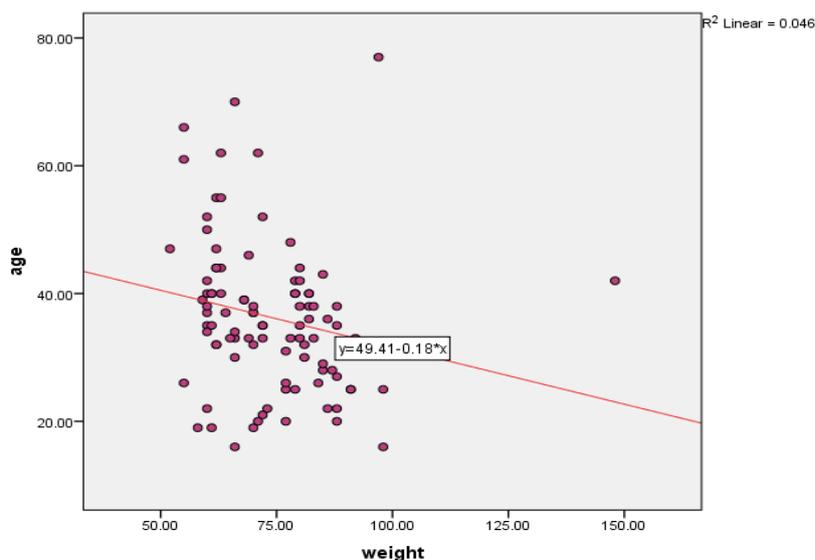
			Vaginal bleeding		Total
			No	Yes	
type of fibroid according to it location	cervical fibroids	Count	2	3	5
		%	40.0%	60.0%	100.0%
	intramural fibroids	Count	19	48	67
		%	28.4%	71.6%	100.0%
	Sub mucosal fibroids	Count	3	9	12
		%	25.0%	75.0%	100.0%
	Subserosal fibroids	Count	4	12	16
		%	25.0%	75.0%	100.0%
Total		Count	28	72	100
		%	28.0%	72.0%	100.0%

Chi-Square = 3.975a P value = .913

Table13: correlation between age, weight and number size of fibroid:

		Age	Weight	number size of fibroid (cm)
Age	Pearson Correlation	1	-.214*	.008
	Sig. (2-tailed)		.033	.936
	N	100	100	100
Weight	Pearson Correlation	-.214*	1	.129
	Sig. (2-tailed)	.033		.201
	N	100	100	100
number size of fibroid (cm)	Pearson Correlation	.008	.129	1
	Sig. (2-tailed)	.936	.201	
	N	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).



P value = .033 R value = -.214

Figure1: Scatter plot chart shows the relation between the age and weight (given by this function; $y = 49.41x - 0.18$).

IV. Discussion

The study done during the period from 8 Saturday September 2018 to 31 Thursday January 2019. The study show that from these features found significant correlation with the age, weight and number size of fibroid this is given by the equation ($y = 49.41x - 0.18$)

V. Conclusion

The main objective of this study was to out the characterization of uterine fibroids among Sudanese women's patient using computer tomography, are common tumors and although benign they can be associated with significant morbidity. Also they may be encountered incidentally when performing imaging for other reasons and are usually easily recognizable. However, degenerate fibroids can have unusual appearances. The study found that the most common age group was (29 – 39) years, clinical finding was vaginal bleeding. And the majority of the fibroids observed among study population were intramural which was (67%) of patients.

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