

Descriptive Study on Ultrasonographic Assessment of Groin Swelling

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Abstract

Original Research Article

Introduction: Abnormalities in the groin can be variable. Therefore, the differential diagnosis of groin masses is important, although clinically, differential diagnosis is difficult because the abnormalities have similar clinical appearances. Ultrasonography is considered the imaging modality of choice for patients with suspected groin abnormalities. Aim: to study ultrasonographic assessment of groin swellings. **Material and Methods:** This was a descriptive type of cross sectional study, conducted at tertiary care teaching hospital of medical college of western Maharashtra. Total 80 patients of groin swelling were studied after obtaining their written informed consent. Patients of all ages, irrespective of genders, who had incidental groin swelling, were included in the study. **Results:** The mean age of all participants was 44.25 ± 24.18 years. Out of 80 patients 91.25% (73) was male and 8.75% (07) were female patients. In our study out of 80 groin swellings, most common swelling diagnosed by USG was inguinal hernia (64). Other groin swelling were of undescended testis (09), pseudoaneurysm of femoral artery (02), inguinal lymphadenopathy (02), encysted hydrocele of spermatic cord (01), hydrocele of the canal of Nuck (01) and funicular hydrocele (01). **Conclusion:** Present study conclude that the ultrasonography can be used to in the assessment of groin swelling to differentiate lesion.

Keywords: Ultrasonography, Groin, Swelling, Inguinal Hernia.

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INTRODUCTION

Ultrasonography (USG) is an effective and established technique in diagnostic imaging. It is further continuing to expand with the development of newer clinical application and with advancement of ultrasound technology. Ultrasonography is considered the imaging modality of choice for the patients with suspected groin abnormalities [1]. Groin abnormalities can be caused by various diseases having a similar clinical presentation and clinical findings may be nonspecific in many cases, thus making the differentiation of pathology involved difficult or even impossible [2]. The main pathologic conditions manifesting as masses in the groin fall into five major groups as follows: congenital abnormalities (cysts, undescended testis), non-congenital (acquired) hernias (inguinal and femoral hernias), vascular conditions, (hematoma, pseudoaneurysm, varicocele), infections or inflammatory conditions, inguinal lymphadenopathy and neoplasms[3].

In cases in which the exact nature of a palpable mass in the groin is sometimes difficult to establish, and clinical diagnosis is obscured by obesity, previous surgery, radiation or trauma or in cases in which a herniated sac protrudes between muscle layers, ultrasonography can play an important role in the

assessment of the correct diagnosis[2]. High resolution, real time ultrasound imaging is accurate for distinguishing between solid and cystic lesion [1]. Ultrasonography can distinguish between inguinal hernias and other inguinal canal masses such as undescended testis or varicoeles.⁴In addition, ultrasonography may play important role in distinguishing between benign and malignant cause of inguinal lymphadenopathy [1]. Ultrasound offers the benefit of being non-invasive whilst allowing dynamic examination of the groin [5].

Groin swelling/lesion can be caused by different array of conditions involving different anatomical structures and having varied clinical presentation. This makes definitive diagnosis difficult for even the most experienced clinician. Ultrasonography can be invaluable in both localizing and characterizing otherwise uncertain groin pathology. With this background, present study was conducted at tertiary care teaching hospital with aim to ascertain the role of ultrasonography in the assessment of groin swellings.

MATERIALS AND METHODS

Institutional Ethics Committee (IEC) permission was obtained before commencement of study. This was a descriptive type of cross sectional study, conducted at tertiary care teaching hospital of medical college of western Maharashtra. Hospital has a state of art infrastructure to provide comprehensive health care services to the people of its catchment area. Present study was conducted in the ultrasonography section of the department of radiology over the period of two years. Total 80 patients of groin swelling were studied after obtaining their written informed consent. Patients of all ages, irrespective of genders, who had incidental groin swelling, were included in the study. Those who were not willing to participate had only scrotal swelling was excluded from the study. In present study Siemens Acuson X500 ultrasonogram, 5-10 MHz Linear Array Transducer was used. Color and Power Doppler sonography was performed with optimized parameters.

In every patients history relevant to present study was obtained followed by clinical examination was performed. Examination of the groin in both men and women is performed with patient standing and the physician seated on a stool facing the patient [6]. The groin area was examined in oblique position with patient first at rest followed by active coughing to look for any bulge or an abdominal motion. In suspected groin hernias, the '3 finger' test was applied to differentiate between various types of groin hernias. The coughing test was used to distinguish between direct and indirect inguinal hernias. The patient was then asked to take supine position for ultrasound examination and change in the size of the swelling, if any, was observed. The results of the clinical examination were documented.

Statistical analysis

Data coding and entry was done in Microsoft Excel spread sheets and descriptive and inferential statistical analysis was done by using SPSS version 21 (Statistical Package for Social Sciences) software. The raw data was compiled, classified, presented in a tabulated manner to bring out important details. Quantitative and qualitative data were presented using mean, standard deviation, range and proportion, frequency count respectively. Chi square test was used to find out association and 5% level of significance considered significant ($P < 0.05$)

RESULTS

In present study 80 patients with groin swelling were studied. The mean age of all participants was 44.25 ± 24.18 years. Age wise distribution of patients has shown in table no 01. The maximum number of patients was seen in the age group of 61-70 years (23.75%) and least affected age was 81-90 years (01.25%). In present study male preponderance was

noted. (Graph 01) Out of 80 patients 91.25% (73) were male and 08.75% (07) were female patients. Swelling (71.55%) was reported as most common symptom by participants, followed by swelling with pain (20.0%) and pain only (08.75%) were the least reported symptoms. In present study, 51.25% (41) patients has groin swelling on right side while 42.25% (33) had lesion of their left side. Six (07.5%) groin swelling were bilateral.

Spectrum of diagnosis of groin swelling by ultrasonography has shown in graph no 02. Out of 80 groin swellings, most common swelling diagnosed by USG was inguinal hernia (80%) and next to it was undescended testis (11.25%). Out of 64 groin swelling 48.44% (31) and 42.19% (27) were on the right and left side respectively. Bilateral inguinal hernias found to be in 06 (09.37%) patients, so overall 70 groins with inguinal hernia were found. Distribution of the inguinal hernias according to their type and laterality has shown in table no 02. Out of 45 cases of indirect inguinal hernias 42 were unilateral and 03 were bilateral while in direct inguinal hernias 22 cases were bilateral and 03 cases were unilateral. The statistical significant association was found between type of inguinal hernia and age of the patients. (Chi-square test $\chi^2: 19.88$ d.f:8, $P: 0.01$, Significant) In present study, out of 45 cases of indirect inguinal hernias, 28 contain omentum and 17 cases had bowel loop in their hernial sac; while out of 25 cases of direct hernias; omentum and bowel loop detected in 15 and 10 hernial sac respectively. (Graph no 03) Out of 70 inguinal hernias 84.28% (59) were uncomplicated and 15.72% (11) were complicated inguinal hernias. Incarceration (06) was most common type of complication found in inguinal hernias while strangulation (04.29%) and obstruction (02.89%) were other type complication.

Next common groin swelling detected by ultrasonography was undescended testis. In the present study 09 (11.25%) patients diagnosed with undescended testis. All nine patients in the study group had unilateral undescended testis, majority of them (66.67%) on right side. Two patients with pseudoaneurysm of femoral artery were noted in the study group. Both patients were male with age 70 years and 52 years respectively. In present study 02 patient of inguinal lymphadenopathy were detected.

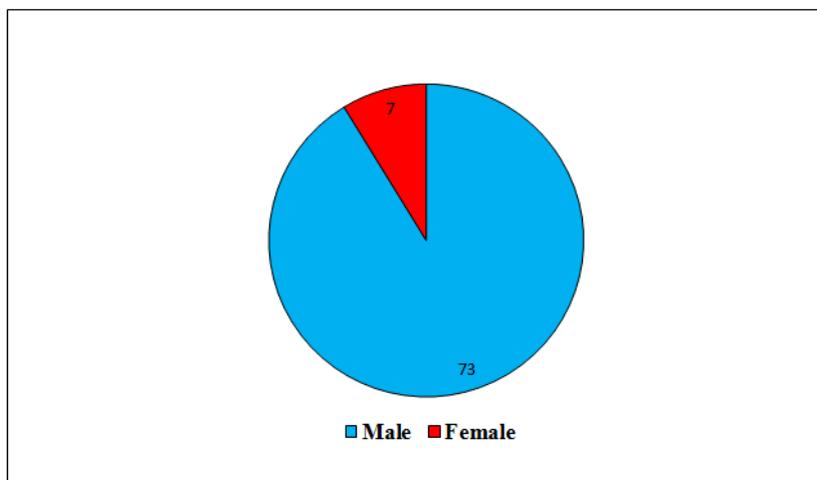
The first patient was a 66 years old male who was a known case of Non-Hodgkin's Lymphoma. The Second patient was a 69 year old male who presented with palpable, tender masses in the left groin. Eighteen year old male patient who presented with swelling associated with mild pain, on ultrasonography it was diagnosed encysted hydrocele of spermatic cord. In the present study swelling in the right groin region of a 12 years female patient, was diagnosed as hydrocele of canal of Nuck on USG. A fluctuant swelling in right

groin of 62 years male were detected as funicular hydrocele on ultrasonography.

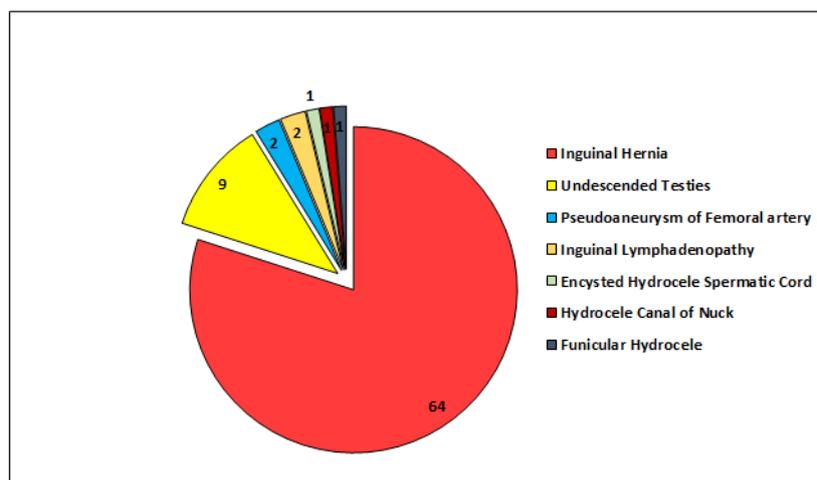
Table-01: Age wise distribution of the participants (n=80)

Sr. No.	Age groups (Yrs.)	No of patients (%)
1.	01-10	10 (12.5%)
2.	11-20	07 (08.75%)
3.	21-30	10 (12.5%)
4.	31-40	06 (07.5%)
5.	41-50	08 (08.75%)
6.	51-60	11 (13.75%)
7.	61-70	19 (23.75%)
8.	71-80	08 (10.00%)
9.	81-90	01 (01.25%)
	Total	80 (100%)

Mean ± SD: 44.25 ± 24.15 Yrs.



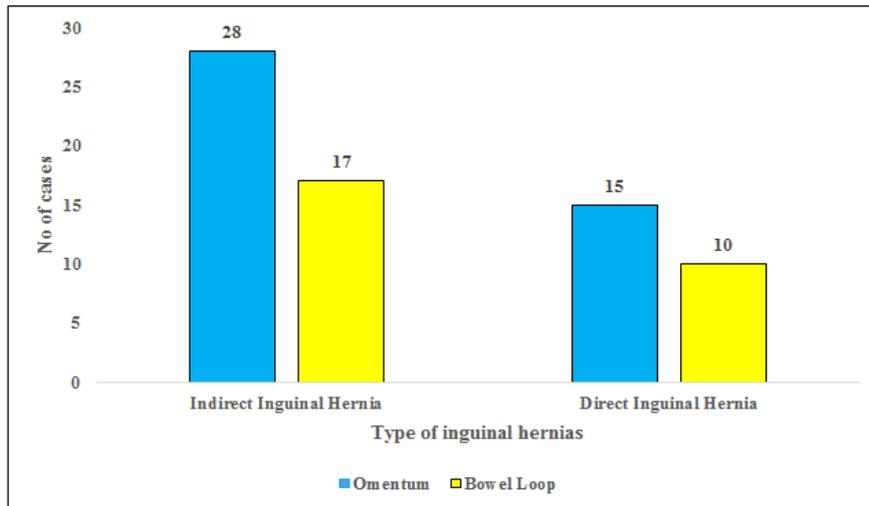
Graph-01: Gender wise distribution of the patients



Graph-02: Spectrum of diagnosis by Ultrasonography

Table-02: Distribution of inguinal hernias according to type and locality

Sr. No.	Type of Inguinal Hernia	Laterality		Total
		Unilateral	Bilateral	
01	Indirect Inguinal Hernia	42	03	45 (64.28%)
02	Direct inguinal Hernia	22	03	25 (35.71)
	Total	64	06	70(100%)



Graph-03: Distribution of hernial sac content of indirect and direct inguinal hernias

DISCUSSION

A total of 80 patients of groin swelling who have undergone ultrasonography investigation were included in the study. The minimum and maximum age of the participants was 01 years and 83 years respectively. A male predominance was noted in the study participants with 73 (91.25%) male and 07 (8.75%) were female patients. In our study out of 80 groin swellings, most common swelling diagnosed by USG was inguinal hernia (64). Other groin swelling were of undescended testis (09), pseudoaneurysm of femoral artery (02), inguinal lymphadenopathy (02), encysted hydrocele of spermatic cord (01), hydrocele of the canal of Nuck (01) and funicular hydrocele (01). There were 64 patients with 70 hernias including 06 bilateral hernias in the study group. In comprised of 58 males and 06 females, in the age range of 1 years to 83 years. The age ranges reported in other studies were Korenkov M *et al.* [7] (20-84 years.), Bradley M *et al.* [8] (28-90 years) and Kraft BM *et al.* [9] reported 20-92 age range. In present study about 80% of patients were in the age range of 21-83 years. The incidence of inguinal hernias in the present study predominantly seen in males (90%). Bradley M *et al.*[8] and Kraft BM *et al.* [9] reported male incidence 89.3% and 92% respectively. The male predominance can be attributed to more amount of physical work done by males. In present study incidence of indirect inguinal hernias found to be more than direct type of hernia. In present study most of the hernias had omentum had omentum as the content. Study conducted by Yang DM [10] also reported similar findings.

In the present study 09 patients were diagnosed with undescended testis. All nine patients in the study group had unilateral undescended testis, majority of them (66.67%) on right side. These findings correlated with description of undescended testis given by Yang DM *et al.* [10] and Van den Berg JC *et al.* [11]. Burgu B *et al.*[12] reported that in his study 70%

undescended testis were on right side while 30% were on left side. In our study two patient of pseudoaneurysm of common femoral artery were found. Both patients were males with age of 70 years and 52 years. Two patients were found to have inguinal lymphadenopathy. The first patient was 66 years old male, diagnosed case of Non-Hodgkin's Lymphoma. Somewhat similar findings reported Krishna RP *et al.* [13] for malignant lymphadenopathy. In present study one case of each; encysted hydrocele of the spermatic cord, hydrocele of the canal of Nuck and Funicular hydrocele were detected on ultrasound examination.

CONCLUSION

Present study concludes that the ultrasonography can be used to in the assessment of groin swelling to differentiate lesion.

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