

Role of high-resolution ultrasound in evaluating and distinguishing the types of inguinal hernia

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Abstract

Background: Ultrasonography has long been established as a tool for diagnosis in the inguinal region and shows good sensitivity and specificity as a noninvasive technique in detecting inguinal hernias.

In addition to all the advantages of conventional ultrasonography, colour Doppler ultrasonography allows evaluation of vascular blood flow and in assessing other complications.

Diagnosing the type of inguinal hernia is important because, evidence suggests that the risk of incarceration in direct inguinal hernia is one tenth of that for indirect inguinal hernia

Aims and objectives

To evaluate the role of high-resolution ultrasound in differentiating the types of inguinal hernias along with surgical correlation

Materials and methods: This study is an prospective study conducted on 64 patients using Philips affinity 50G in department of radio-diagnosis in Alluri Sitarama Raju Academy of Medical Sciences referred with history of swelling in the groin (1st October 2020 to 30th September 2021). Color Doppler and power Doppler sonography were performed with optimized parameters.

Results: The age range of the patients were between 8-79 years with a majority of patients in the age group of 41-

50 years. Indirect inguinal hernia was found to be more common and was found in 73% of the study group. 80% of the inguinal hernias had omentum as its contents while 20% had bowel loops as its contents. On comparing the accuracy of clinical diagnosis and ultrasonography, it was found that ultrasonography had a higher accuracy of 96.5%. Ultrasonography was found to have higher accuracy in diagnosing indirect inguinal hernia.

Conclusion: High resolution ultrasonography is an important first line imaging technique in the investigation of inguinal hernias with a high accuracy in evaluation the type of inguinal hernia. Identifying the type of hernia is particularly useful, as direct hernias are less prone to strangulation than indirect hernias and therefore, it may not be necessary to operate on this type of hernia in elderly patients with other co morbid conditions.

Keywords: Direct inguinal hernia, Indirect inguinal hernia, Complicated and Uncomplicated Inguinal hernias, Bowel, Omentum

Introduction

Ultrasound is an effective and established technique in diagnostic imaging it is further continuing to expand with the development of further clinical applications and with the advancement of ultrasound technology. Colour Doppler ultrasonography allows evaluation of vascular blood flow and in assessing other complications. Diagnosing the type of inguinal hernia is important because, evidence suggests that the risk of incarceration in direct inguinal hernia is one tenth of that for indirect inguinal hernia. The indications for surgical interventions in the treatment of inguinal hernia consists of prevention and relief of incarceration as well as patient relief.

Aims and objectives

To evaluate the role of high-resolution ultrasound in differentiating the types of inguinal hernias along with surgical correlation.

Materials & Methods

This study is a prospective study conducted on 64 patients using Philips affinity 50G in department of Radiodiagnosis in Alluri Sita Rama Raju Institute of Medical Sciences referred with history of swelling in the groin from 1st October to 30th september 2021. Color doppler and power doppler sonography were performed with optimized parameters

Source of data

Patients referred from outpatient department of tertiary care Centre with history of swelling in the groin.

Selection criteria

Inclusion criteria

All patients with mass/swelling in groin region were included in the study

Exclusion criteria

Children below 5 years of age were excluded from the study as they were not able to co-operate with the techniques used such as performing Valsalva maneuvers for dynamic study.

Results

Among the 40 patients, majority of the patients are in the age group of 41-50 years. Majority of the swellings are on the right side. 73% of the hernias are indirect hernias and 27% of the hernias are direct hernias. Omentum as the content is present in 80% of the hernias and bowel as a content is seen in 20% of the cases. Among the cases 36 patients presented as an uncomplicated hernia and 4 patients presented as complicated hernia. On comparing the accuracy of clinical diagnosis and ultrasonography, it was found that ultrasonography had a higher accuracy in

the diagnosis of indirect hernia which is 96.5% and an accuracy of 81.8% in the diagnosis of direct inguinal hernia

Figure1: Distribution of patients according to the ages and sexes.

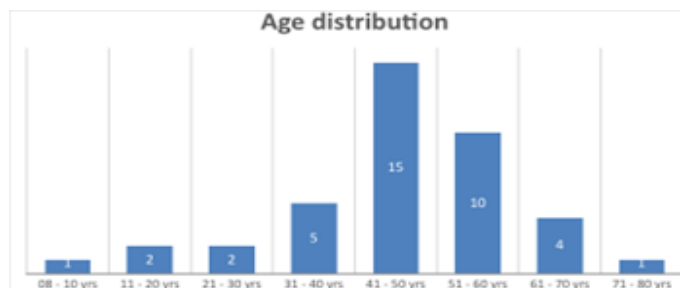


Figure 2: Side of the swelling.

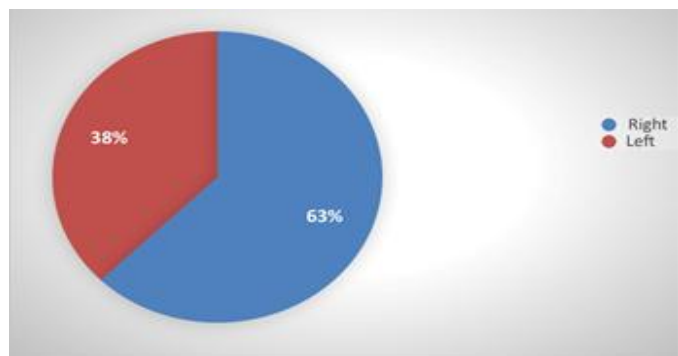


Figure 3: Type of hernia

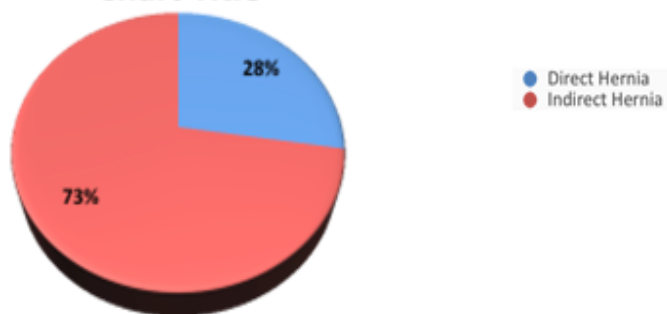


Figure 4:Contents of hernia

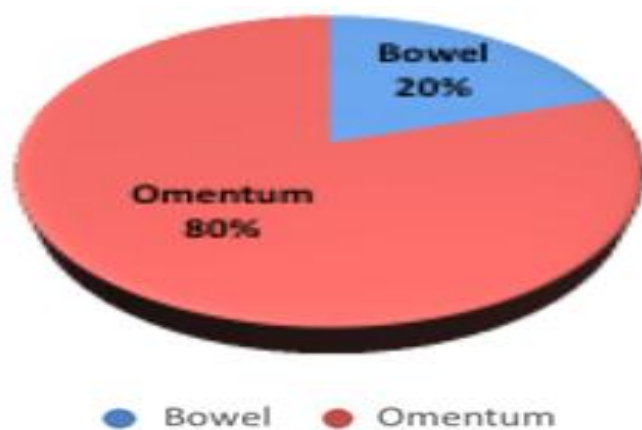


Figure 5: Transverse section showing indirect inguinal hernia with the hernia sac lateral to the inferior epigastric vessels. The hernia sac is also seen to contain bowel loops.

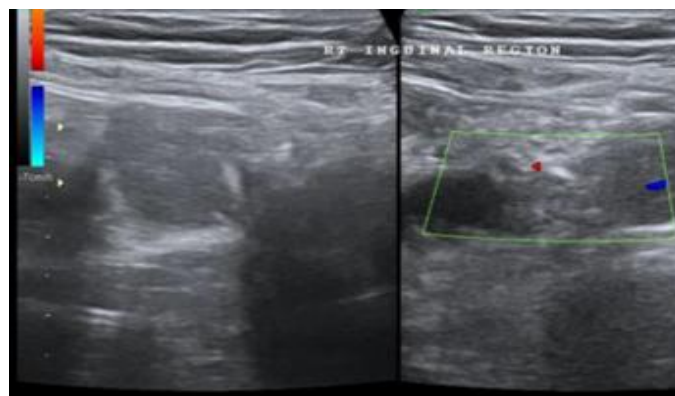


Figure 6: Transverse section of another patient with indirect inguinal hernia showing the hernia sac lateral to the inferior epigastric vessels. The hernia sac is seen to contain omentum.

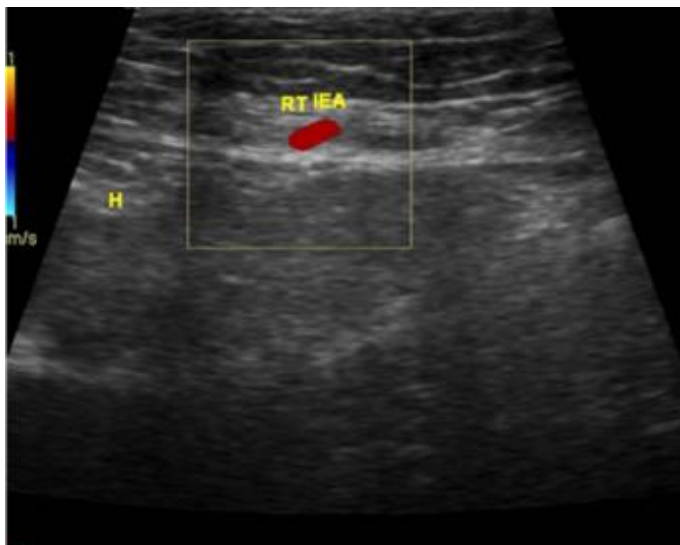


Figure 7: Transverse section in a patient showing the hernial sac medial to the inferior epigastric vessels. The hernial sac is seen to contain omentum.

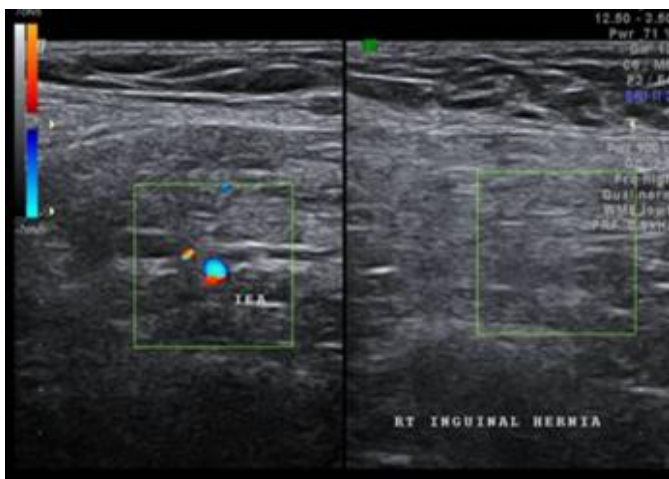
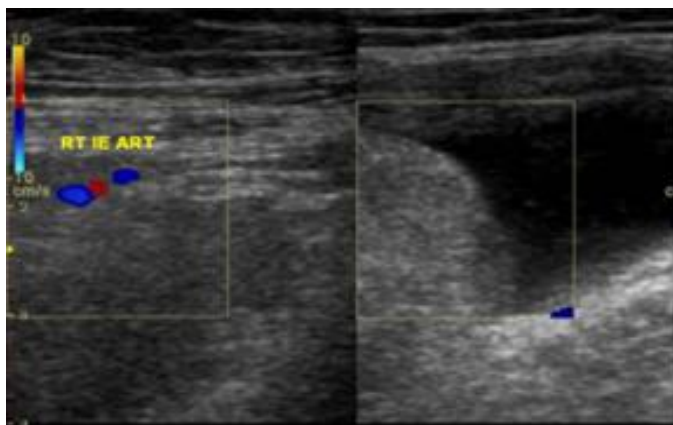


Figure 8: Transverse section showing hernial sac medial to the right inferior epigastric vessels with ascitic contents.



Discussion

- Studies done by Lorenzini et al.,²² reported a high sensitivity and specificity in detecting hernias in these patients
- A study by Michael Korenkov et al.,¹⁸ showed that physical examination had a very high accuracy of almost 100% in diagnosing the type of inguinal hernia.
- Both direct and indirect hernias had omentum as its contents more often than bowel loops
- As shown by the observations in this study, ultrasonography along with colour Doppler helped to assess the contents and complications associated with inguinal hernias. Furthermore, ultrasonography provided a higher degree of correlation with the intraoperative findings than clinical examination in evaluating and differentiating the types of inguinal hernia

Conclusion

1. High resolution ultrasonography is an important first line imaging technique in the investigation of inguinal hernias with a high accuracy in evaluation the type of inguinal hernia
2. As colour Doppler ultrasonography is easily performed, is non-invasive, and less expensive than a CT scan of the inguinal region, it can be a significant support in distinguishing between the different types of inguinal hernia.
3. Identifying the type of hernia is particularly useful, as direct hernias are less prone to strangulation than indirect hernias and therefore, it may not be necessary to operate on this type of hernia in elderly patients with other co morbid conditions

References

1. Rettenbacher T, Hollerwager A, Macheiner P, Griezmann N, Gottwald T, Frass R, et al. Abdominal wall hernias: cross sectional imaging signs of

incarceration determined with sonography. *AJR Am J Roentgenol* 2001; 177:1061–6.

2. Korenkov M, Paul A, Troidl H. Color duplex sonography: diagnostic tool in the differentiation of inguinal hernias. *J Ultrasound Med* 1999; 18:565–568

3. Wechsler RJ, Kurtz AB, Needleman L, et al. Cross-sectional imaging of abdominal wall hernias. *AJR* 1989;153: 517-521

4. Delabourse E, Michalak is D, Sarliève P,Paratte B, Rodière E, Kastler B. Value of the pubic tubercle as a CT reference point in groin hernias. *J Radiol* 2005;86(6 pt. 1):651–654.

5. Leander P, Ekberg O, Sjoberg S, Kesek P. MR imaging following herniorrhaphy in patients with unclear groin pain. *Eur Radiol* 2000; 10:1691.

6. Lorenzini C, Sofia L, Pergolizzi EP, Trovato M. The value of diagnostic ultrasound for detecting occult inguinal hernia in patients with groin pain. *Chir Ital* 2008; 60:813–817.