ORIGINAL RESEARCH PAPER
Volume-9 | Issue-3 | March-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CURRENT STATUS OF ULTRASONOGRAPHY IN THE EVALUATION OF THE RETROPERITONEAL MASSES : A REVIEW

Radiodiagnosis

Manoj MC Post Graduate, Department Of Radiology, Mahatma Gandhi Medical College And Research Institute, Pondicherry

Prabhu CS* Associate Professor, Department Of Radiology, Mahatma Gandhi Medical College And Research Institute, Pondicherry *Corresponding Author

Lokesh kumar T Assistant Professor, Department Of Radiology, Mahatma Gandhi Medical College And Research Institute, Pondicherry

ABSTRACT

Masses arising from the retroperitoneum are broadly classified into Primary retroperitoneal masses and masses arising from the retroperitoneal organs. Patients usually present with non – specific signs and symptoms and physical examination is also inconclusive in many cases. Ultrasonography (USG), Computed tomography (MDCT) and Magnetic resonance imaging (MRI) are the common imaging modalities available to evaluate any mass in the abdomen. In this review we evaluate the usefulness of ultrasonography to characterize the retroperitoneal masses because the imaging study has to be appropriate according to the diagnostic need and socioeconomic situation especially in the rural India setup.

KEYWORDS

Retroperitoneal Lesions, Ultrasonography, Retroperitoneum, Retroperitoneal Masses

INTRODUCTION:

The retroperitoneum is the space located in the abdomen between the parietal peritoneum and the transversalis fascia. This space comprises of various solid organs and other small spaces which are separated by the fasciae[1]

Masses arising from the retroperitoneum are broadly classified into Primary retroperitoneal masses and masses arising from the retrop eritoneal organs. The masses are either benign or malignant. Patients usually present with non – specific signs and symptoms and physical examination is also inconclusive in many cases[2]. Ultrasonography (USG), Computed tomography (MDCT) and Magnetic resonance imaging (MRI) are the common imaging modalities available to evaluate any mass in the abdomen. At present, MDCT and other modern imaging techniques are extensively used for the diagnosis of the retroperitoneal lesions as well as for the staging of the malignant lesions[3]

We would like to review the current role of ultrasonography in the evaluation of the masses as modern imaging techniques are unav ailable in peripheral and rural India setup. In this review we evaluate the usefulness of ultrasonography to characterise the retroperitoneal masses because the imaging study has to be appropriate according to the diagnostic need and socioeconomic situation[3].

MATERIALS AND METHODS:

A comprehensive search was done in the literature using Google scholar by the keywords **ultrasonography**, **retroperitoneal organs** and **retroperitoneal lesions.**

As retroperitoneal masses include the lesions arising from the various retroperitoneal organs like kidneys, adrenals, pancreas, great vessels like abdominal aorta as well as from retroperitoneal spaces and psoas muscle, studies related to the lesions arising from the specific structures were also categorized and searched in the literature using Pubmed and google scholar. A total of 16 studies were found.

DISCUSSION:

Pant et al, 2016 evaluated 50 patients presenting with the signs and symptoms of retroperitoneal masses and concluded Ultrasound is the initial investigation of choice for the patients presenting with abdominal pathology. It will provide us a safe, non – invasive, quick and effective tool for abdomen including various retroperitoneal pathologies[4]

RENAL HEMATOMA

Renal hematoma most commonly occurs in renal injury. Renal injury is either due to blunt or penetrating trauma. Majority of the renal trauma (80 – 90%) is blunt rather than penetrating. Renal trauma is common in blunt trauma[5]

M GM et al, 2018 stated that In a renal injury, we may see wide varaity of sonographic findings . The common presentation is a hematoma located in the subcapsular or perinephric areas. Sometimes kidney fracture can also cause parenchymal hematoma with associated calyceal dilation. Bowel gas and lack of solid organ interface can make visualization of fluid in the anterior pararenal space difficult, while fluid in the posterior pararenal space must be distinguished from intraperitoneal fluid in the Morison's pouch[6]

RENAL TUMORS

Helenon et al, 2001 studied the USG characteristics of patients with renal tumors in 65 patients and stated Renal masses are diagnosed incidentally in most of the cases. Majority of the cases comprise renal cell carcinomas. Differentiation of the renal cell carcinomas from benign lesions is of atmost importance, though it may not be possible in some cases[7]. Grey scale ultrasound when combined with Doppler strongly suggests the histopathological nature of the tumor in many cases[8]

RENAL ABSCESS

Renal or perinephric abscess develops as a complication of the urinary tract infection , commonly acute pyelonephritis. Renal abscess is either focal or diffuse . In cases of focal nephritis, the renal abscess is seen as inflamed wedge shaped area. This inflammation will lead into the parenchymal necrosis and abscess formation. Renal abscess are more commonly solitary and my spontaneously decompress into the collecting system and perinephric space. **Ali et al**, 2017 concluded that Ultrasound plays a significant role in the follow up and for the percutaneous drainage of the abscess[7].

PANCREATIC PSEUDOCYST

Post inflammatory pseudo cysts are most commonly encountered in the clinical practice. These are defined as a localised fluid collections rich in amylase formed within or adjacent to the pancreatic tissue which surrounded by a fibrous wall that doesnot possess an epithelial lining[4].

PANCREATIC CARCINOMA

USG is the initial investigation of choice for the patients presenting with abdominal pain or jaundice as it is cost effective and non invasive[9].

Lee et al, 2014 studied the characteristics of pancreatic carcinoma in various cross sectional imaging modalities. His conclusions are:
A hypoechoic mass is generally on ultrasound in the patients with pancreatic carcinoma. Additional findings like dilatation of the pancreatic duct and bile duct are seen typically on USG[10]. However, it is quiet difficult to detect the lesions in case of pancreatic body and tail as the indirect signs like the ductal dilation would not bee seen and the gas shadows from the transverse colon and the stomach obscure the visualisation. Oral administration of water or other contrast agents

may help for the better visualisation in such cases[11].

The sensitivity of USG for pancreatic lesions also depends on the operator, disease progression and patients body habitus[2].

ADRENAL TUMORS

Horwich et al 2019, has stated that USG plays a significant role in the diagnosis of adrenal incidentaloma, but no specific appearance has been documented for the benign adenoma.

ADRENAL ADENOMA

USG plays a significant role in the diagnosis of adrenal incidentaloma. But no specific appearance has been documented for the benign adenoma[12]

ADRENAL ADENOCARCINOMA

Fan J et al, 2014 studied the Benign and Malignant Adrenal lesions in 882 patients and stated Adrenocortical carcinoma usually presents as a large, with ill defined borders and heterogeneous mass when the diagnosis is made. Colour Doppler shows increased Vascularity or an afferent blood supply [13]

ADRENAL MYELOLIPOMA

Myelolipoma is uncommon and benign variant of adrenal tumor which has fat and hematopoietic components.Incidental diagnosis is made in many cases. At present. **Fan et al,** 2014 concluded that USG helps in diagnosis of these tumors before surgery. A mass with adipose tissue with increased echogenicity is the important marker for the diagnosis[13]

PHEOCHROMOCYTOMA

They can be homogeneous or heterogeneous solid masses, which depend on the internal hemorrhage or necrosis. **Horwich et al**, 2019, stated that USG confirms cystic and necrotic changes of the pheochromocytomas. The cyst may be anechoic or may have echogenic debris, and posterior acoustic enhancement may be the additional feature[13]

PSOAS ABSCESS

Mallick et al, 2004 studied the imaging features of psoas abscess and concluded that Ultrasound can diagnose psoas abscess in only 60% of the cases. The retroperitoneal space is difficult to visualize by USG and is usually obscured by bowel gas.[14]

ABDOMINAL AORTIC ANEURYSM

Kumar et al, 2016 mentioned, Studies have been proved that that AAA screening using USG is effective and decreases adverse health outcomes related to the condition. Screening for AAA is done usually in the age group of 65 to 74 yrs[15]

PRIMARY RETROPERITONEAL MASSES

They show aggressive behavior by invading into other tissues. Very rarely lymphadenopathy and metastasis will be seen. MDCT is the imaging modality of choice for these masses. Other Diseases of the retroperitoneum, include the retroperitoneal collections, fibrosis and hemorrhages[16]

CONCLUSION

In view of these studies, we recommend ultrasound as the primary tool for evaluating retroperitoneal lesions and CT for confirmation and for evaluating the complete extent of the lesion. We also conclude that, in our rural India setup, these modalities have to be tailored to the clinical need and the socioeconomic status of the patient.

REFERENCES:

1. Quaia E, Gennari AG. Normal Radiological Anatomy of the Retroperitoneum. In: Quaia E, editor. Radiological Imaging of the Kidney [Internet]. Berlin, Heidelberg: Springer Berlin Heidelberg; 2014 [cited 2019 Oct 8]. p. 75–9. Available from: http://link.springer.com/10.1007/978-3-642-54047-9_3
2. Pant H, Shukla S, Ahmad R. Role of ultrasound in evaluation of retroperitoneal lesions. J Evol Med Dent Sci. 2016 Jul 4;5(53):3563–8.
3. D H, B S, Swamy S, K U V K. Role of ultrasonography and ct in the evaluation of abdominal masses. J Evid Based Med Healthc. 2015 Oct 13;2(42):7166–84.
4. Pant H, Shukla S. Role of ultrasound in the evaluation of pancreatic lesions. J Evol Med Dent Sci. 2017 Jan 23;6(07):565–9.
5. M GM, C P, V L. Isolated Renal Laceration on Point-of-care Ultrasound. Cureus [Internet]. 2018 Jan 25 [cited 2019 Oct 8];10(1). Available from: https://www.cureus.com/articles/10539-isolated-renal-laceration-on-point-of-care-ultrasound
6. Kawashima A, Sandler CM, Corl FM, West OC, Tamm EP, Fishman EK, et al. Imaging of Renal Trauma: A Comprehensive Review. RadioGraphics. 2001 May 1;21(3):557–74.
7. Hélénon O, Correas J, Balleyguier C, Ghouadni M, Cornud F. Ultrasound of renal tumors. Eur Radiol. 2001 Oct;11(10):1890–901.
8. Gheissari A. The Place of Ultrasound in Renal Medicine. Saudi J Kidney Dis Transplant. 2006 Oct 1;17(4):540.
9. Solid malignant retroperitoneal masses—a pictorial review [Internet]. [cited 2019 Oct 6]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3948907/
10. Lee ES, Lee JM. Imaging diagnosis of pancreatic cancer: A state-of-the-art review. World J Gastroenterol WJG. 2014 Jun 28;20(24):7864–77.
11. Kim YH, Saini S, Sahani D, Hahn PF, Mueller PR, Auh YH. Imaging Diagnosis of Cystic Pancreatic Lesions: Pseudocyst versus Nonpseudocyst. RadioGraphics. 2005 May 1;25(3):671–85.
12. Adrenal Adenoma Imaging: Practice Essentials, Computed Tomography, Magnetic Resonance Imaging. 2019 May 29 [cited 2019 Oct 9]; Available from: https://emedicine.medscape.com/article/376240-overview
13. Fan J, Tang J, Fang J, Li Q, He E, Li J, et al. Ultrasound Imaging in the Diagnosis of Benign and Suspicious Adrenal Lesions. Med Sci Monit Int Med J Exp Clin Res. 2014 Nov 3;20:2132–41.
14. Practical approach to primary retroperitoneal masses in adults [Internet]. [cited 2019 Oct 6]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6290739/
15. Ultrasound Screening for Abdominal Aortic Aneurysm. Ont Health Technol Assess Ser. 2006 Jan 1;6(2):1–67.
16. Chaudhari A, Desai PD, Vadel M, Kaptan KR. Evaluation of primary retroperitoneal masses by computed tomography scan. In 2016.