



Journal Homepage: - www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/xxx
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/7972>



RESEARCH ARTICLE

ULTRASOUND AS A FIRST LINE INVESTIGATION OF CHOICE IN DIAGNOSIS OF ACUTE CHOLICYSTITIS.

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Manuscript Info

Manuscript History

Received: 01 September 2018
 Final Accepted: 03 October 2018
 Published: November 2018

Keywords:

US Scan, Cholelithiasis, WES ; wall-echo-shadow sign, CBD common bile duct, PV portal vein

Abstract

Aim: Aim of our study to diagnose acute cholecystitis on ultrasound as a first line investigation to prevent patient from developing complications like duct obstruction, perforation and gangrenous gallbladder due to impaction of stones in the ducts.

Material & Methods: Ultrasound is the method of choice for detection for the detection of gall bladder pathology, sonologically it can best be appreciated / comment on gallbladder wall (increased when above 3.5mm), lumen, impaction of stones in lumen and fluid around gallbladder.

Total of 20 patients in month of October, 2018 were included who came from emergency, OPD and ward to Radiology department of Medicare Cardiac & General hospital with complaints of right hypochondriac/ epigastric pain, loss of appetite, nausea, vomiting.

Results: out of total of 20 patients, all had complaint of right upper hypochondrial pain. Sixteen patients (80%) two had thickened wall with stones (10%) one had thickened wall, fluid around gallbladder (5%) with stones and one patients ultrasound image showed contracted gallbladder due to chronic cholecystitis (5%). Two patients had cholecystitis without stones.

Conclusion: Ultrasound has been a most useful tool for detecting gallbladder pathology such as acute cholecystitis with or without cholelithiasis with accuracy.

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Introduction:-

Acute cholecystitis is defined as an acute inflammation of the gallbladder wall, regardless of the cause. In the many of cases, the cause is the obstruction of the cystic duct due to an impacted stone in either the neck of the gallbladder or the cystic duct (acute calculous cholecystitis). Acute cholecystitis can develop without associated cholelithiasis (acute acalculous cholecystitis). [1] It is very uncommon that a patient without an history of biliary symptoms, such as colic pain, develop an acute cholecystitis. Approximately < 15% of the patients with cholelithiasis experience clinical symptoms and < 5% an acute cholecystitis [2].

In study done on American population, 25 million have cholelithiasis. In 80% of cases, the cholelithiasis is primarily composed of cholesterol, with pigments, calcium bilirubinate, and calcium carbonate [3].

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Forty percent of patients with acute cholecystitis develop complications [4]: the complications of cholecystitis most commonly result from the impaction of gallstones in the cystic duct or common bile duct and include gallbladder hydrops, emphysematous cholecystitis, which is seen more commonly in men and diabetic patients, gangrenous cholecystitis and perforation of the gallbladder. The gallbladder may perforate into the abdominal cavity, causing peritonitis, or the perforation may be contained by the omentum leading to an intra-abdominal abscess.

Acute Cholecystitis:

Diagnosis with ultrasonography, ultrasound (US) is the preferred imaging examination for the diagnosis of acute cholecystitis and is the first method used when the clinical presentation is suggestive of biliary pathology. The main findings of acute calculous cholecystitis on US include in addition to the presence of stones include distension of the gallbladder lumen, gallbladder wall thickening, a positive ultrasound Murphy sign, pericholecystic fluid [5,6] and a hyperemic wall upon evaluation with color doppler [7,8].

Material & Methods:-

Ultrasound is the method of choice for detection for the detection of gall bladder pathology , sonologically it can best be appreciated / comment on gallbladder wall, lumen, impaction of stones in lumen and fluid around gallbladder. The characteristic findings of gallstones at ultrasound are a highly reflective echo from the anterior surface of the gallstone, mobility of the gallstone on repositioning the patient (typically in a decubitus position), and marked posterior acoustic shadowing . Gallbladder wall thickness above 3.5mm as a positive finding of acute cholecystitis.

Total of 20 patients in month of October, 2018 were included who came from emergency, OPD and ward to Radiology department of Medicare Cardiac & General hospital with complaints of right hypochondriac/ epigastric pain, loss of appetite, nausea, vomiting

Results:-

Twenty patients with acute cholecystitis had the characteristics given in Table-1.

The characteristic findings of normal gall bladder with normal thickness of wall, no stone visible, common bile duct and portal vein(figure 1) Gallstones ultrasound are a highly reflective echo from the anterior surface of the gallstone, mobility of the gallstone on repositioning the patient (typically in a decubitus position), and marked posterior acoustic shadowing (figure-2). The gallbladder is filled with stones(Fig 3). The anterior wall of the gallbladder is echogenic, below which is a thin, dark line of bile; a highly echogenic line of superficial stones with associated posterior shadowing. (figure 4) image off gallstone obstructing neck of gall bladder causing acute cholecystitis.

Table 1:-Diagnosis of Gall bladder masses by ultrasound.

| Ultrasound Gallbladder Characteristics N=20 | Number of Patients/ Percentage |
|---|--------------------------------|
| Thickened wall with stones | 16(80 %) |
| Thickened wall, fluid around gallbladder with septations | 2(5%) |
| Thickened wall, fluid around gallbladder without septations | 1(5%) |
| Contracted Gallbladder due to chronic cholicystitis | 1 (5%) |
| Thickened wall without stones | 2(10%) |

Figure 1:-Normal Ultrasound of GallBladder.



Figure 2:-Thickened walls of Gallbladder without stone.



Figure 3:-Gallbladder is filled with stones and acute cholecystitis.



Figure 4:-Gallstone obstructive at neck of gallbladder.**Discussion:-**

Ultrasound is the method of choice for detection of gallstones for detection of gall bladder pathology, offering several advantages is that it has high sensitivity and accuracy , noninvasiveness, the option of performing a bedside examination, lack of ionizing radiation, relatively low cost, and the ability to evaluate adjacent organs.[6] in this study finding of acute cholecystitis with calculus were 18 patients (90%) and acalculous cholecystitis were 2 patients (20%).

Gallbladder is filled with stones, the resulting appearance is termed the wall-echo-shadow. Most people with cholelithiasis will not experience symptoms or complications related to gallstones. When biliary colic does occur, it is most often caused by transient obstruction of the cystic duct by a stone. The pain typically lasts 1–3 hours and is often accompanied by nausea and vomiting. When the stone falls back into the gall-bladder or passes into the common bile duct[4]

Ultrasound has the best sensitivity and specificity for evaluating patients with suspected gallstones [9]. As reported in the literature [10]. Some ultrasonographic findings are more strongly associated with acute cholecystitis than others, positive Murphy's sign (pain is provoked by either the transducer or the sonographer's palpation under guidance, in the exact area of the gallbladder) is reported to have sensitivity as high as 88% [11,12]. Ralls et al. [13]report that one of the most important advantages of ultrasound over other imaging techniques in the investigation of acute cholecystitis is the ability to assess for a sonographic Murphy sign, which is a reliable indicator of acute cholecystitis with a sensitivity of 92% [13]. Visualization of gallbladder wall thickening in the presence of gallstones using ultrasound has a positive predictive value of 95% for the diagnosis of acute cholecystitis . An increased gallbladder wall thickness of > 3.5 mm has been found to be a reliable and independent predictor of acute cholecystitis [14].

Thickening of the gallbladder wall in the absence of cholecystitis may be observed in systemic conditions, such as liver, renal, and heart failure, possibly due to elevated portal and systemic venous pressures [15].

Conclusion:-

Ultrasound has been a most useful tool for detecting gallbladder pathology such as acute cholecystitis with cholelithiasis and acalculous cholecystitis with high frequency of accuracy.

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