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A STUDY ON SONOGRAPHIC MURPHY SIGN(SMS) IN PATIENTS WITH SYMPTOMATIC CHOLELITHIASIS -A SERIES OF 100 CASES

Radiodiagnosis

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ABSTRACT

Sonographic Murphy Sign (SMS) means tenderness over the sonographically localised gallbladder that is greater than in other abdominal areas when tested by an ultrasound probe[1][2]. It is an important sonographic sign of cholecystitis.It gains prominence when combined with the presence or absence of cholelithiasis. It is having a high positive and negative predictive value respectively [3]

Objective: To Evaluate the sensitivity and specificity of SMS

Materials and Methods: We evaluated 100 patients with right upper quadrant pain which are already diagnosed with acute cholecystitis caused by gall stones and also other diseases. Results were tabulated based on SMS elicited by the radiologist and the clinical findings by the clinician. Ethical committee approval with waived informed patient consent was obtained prior to data collection.

KEYWORDS

SMS - Sonographic Murphy Sign RUQ - Right Upper Quadrant CDI - Color Doppler Imaging CT – Computed Tomography USG - Ultrasound

Introduction:

Sonographic Murphy Sign (SMS) means tenderness over the sonographically localised gallbladder that is greater than in other abdominal areas when tested by an ultrasound probe[1][2]. It is an important sonographic sign of cholecystitis.

SMS is different from Murphy's sign in the following ways:

1. A radiologist can see the exact position of the gallbladder.
2. The patient generally takes a breath and holds it during scanning, whereas Murphy's sign is elicited while the patient is inhaling.
3. The radiologist will be enquiring the patient about the pain, while the Murphy's sign relies on an involuntary reaction - stopping inspiration when the gallbladder slides under the examining hand.

The differential diagnosis for right upper quadrant pain is vast but after adequate history, examination and investigations, they can be diagnosed.

Liver and gallbladder diseases like stretching of the liver's capsule as in congestive heart failure. The liver can be damaged by blunt trauma. Hepatosplenomegaly can occur with malignancy such as lymphoma, chronic myeloid leukaemia or with autoimmune disease including primary biliary cirrhosis. The Budd-Chiari syndrome can present with RUQ pain. Gallstones are have became more common as years advance. Most are asymptomatic but they can cause pain at any time. Other gallbladder diseases include carcinoma of the gallbladder, which is almost always associated with caliculi. Ascending cholangitis has a classic triad of pain, fever and jaundice.

Bowel lesions include lesions of the hepatic flexure like diverticulitis, ischaemic colitis, constipation and Crohn's disease. Atypical acute appendicitis must be considered. Recurrent symptoms can be caused by irritable bowel syndrome. Meckel's diverticulum can present in a variety of ways, usually in children.

Renal disorders include Pyelonephritis, nephrolithiasis, hydronephrosis, obstruction of the urinary tract.

Respiratory diseases include lobar pneumonia, infarction from pulmonary embolism.

Endocrine or exocrine diseases include diabetic ketoacidosis, Addisonian crisis, adrenal tuberculosis, acute pancreatitis, Carcinoma of pancreas

Infections includes Herpes zoster, subphrenic abscess or even gas after laparotomy or, more often laparoscopy. This pain may be referred to shoulder. A rare condition is Fitz-Hugh and Curtis syndrome. There is inflammation of the liver capsule associated with genital tract infection. It is said to occur in upto one fourth of patients with pelvic inflammatory disease. Classically it presents as sharp, pleuritic RUQ pain but signs of salpingitis can be absent.

Acute cholecystitis generaly accounts for most of hospital admissions for acute abdominal pain, and the current practice standard is early cholecystectomy, making it an important diagnosis.

The most commonly used imaging modality in suspected cholecystitis is right upper quadrant (RUQ) ultrasound. Radiology-performed ultrasound has good sensitivity and specificity and is more convenient than radionuclide scanning, without the radiation exposure of CT.

Stones may be single or multiple. They may be irregular.They show a marginal location or may exhibit dense, uniform calcification.
Plain abdominal film is of limited value in the setting of gallbladder disease because only 15–20% of gallstones are visible on abdominal radiographs and little information about complicated gallbladder disease can be obtained using conventional radiography [4].Our purpose is to determine the sensitivity and specificity of SMS

Materials and Methods:

Abdominal Ultrasound study on Sonographic Murphy Sign in symptomatic cholelithiasis patients. The study was performed on 100 patients. Results were tabulated based on SMS elicited by the radiologist and the clinical findings by the clinician.

For every case the presence of a positive SMS as well as findings like gall-bladder wall thickening, peri-cholecystic fluid, cholelithiasis, choleodocholithiasis and common bile duct dilatation are noted.

Place of study - Radiology department of ASRAMS (regardless of indication) by Philips HD11XE by a curvilinear 3-5 MHz probe and linear 3-12 MHz probe.

Duration of study: The study was carried over a period of 1 year from august 2016 to July 2017.

Selection of patients:

Inclusion criteria: The study consists of 100 patients with right upper quadrant pain which are already diagnosed with acute cholecystitis caused by gall stones and also other diseases.

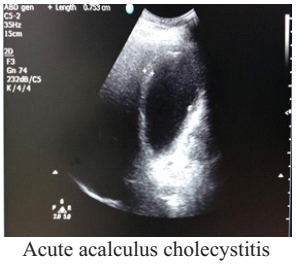
Exclusion criteria: Patients who did not cooperate due to their poor clinical status such as altered sensorium, obstruction of view due to overlying gas etc are not included in the study.



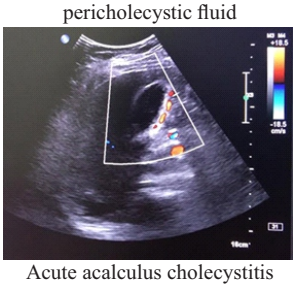
Acute calculus cholecystitis with Gall bladder wall thickenin



Acute calculus cholecystitis with pericholecystic fluid



Acute acalculus cholecystitis



Acute acalculus cholecystitis with increased colour doppler flow in gall bladder wall.



Xanthogranulomatous Cholecystitis



Cholelithiasis

Results:

Over the one year collection period 100 patients presented for abdominal ultrasound were studied. The age of the patients ranged from 8 to 82 years old. Of the 100 consecutively examined patients for investigation ofabdominal pain. 64 patients demonstrated features suggestive of cholecystitis. Of the 64 patients, 56 were associated with positive SMS. Out of 36 remaining patients who are not having any features of cholecystitis were also evaluated. Out of which 16 patients showed a positive SMS.

Sex	No of patients
Males	56
Females	44

Age(years)	No of Patients
8-18	0
19-28	4
29-38	18
39-48	24
49-58	32
59-68	20
69-78	2
79-88	0

No of patients	Cause of abdominal pain
100	Right upper quadrant pain
64	Cholecystitis
8	Congestive heart failure
2	Trauma
4	Atypical Appendicitis
6	Nephrolithiasis
16	Non Specific

True Positive rate=Sensitivity=TPR=TP/P=TP/(TP+FN)

True Negative Rate = Specificity=TNR=TN/N=TN/(TN+FP)

Result	No of patients
True Positive (TP)	56
False Negative (FN)	8
True Negative (TN)	20
False Positive (FP)	16

Discussion and Conclusion:

Ultrasound (USG) of abdomen is the most preferred imaging technique for the diagnosis of acute cholecystitis .It is also the first method used when the clinical presentation is suggestive of biliary pathology. The findings of acute calculous cholecystitis include the presence of stones,distension of the gallbladder lumen, gallbladder wall thickening, a positive sonographic Murphy sign, pericholecystic fluid [5, 6] Ralls et al [7]reported 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% [7]. An increased gallbladder wall thickness of > 3.5 mm has been found to be a reliable and independent predictor of acute cholecystitis[8].The sonographic Murphy sign has been compared to other modalities. In a study of patients with proven gangrenous cholecystitis, the sonographic Murphy sign was not as accurate as other ultrasound characteristics (eg:dilated gallbladder, gallbladder wall thickening, pericholecystic fluid)[9]. Another study showed that color doppler imaging (CDI) of the gallbladder to be more sensitive than a positive sonographic Murphy sign[10]. A possible reason for this observation is that CDI can show hyperaemic changes in the wall of the inflamed gallbladder.

The sensitivity of the sonographic Murphy sign in acute cholecystitis was 88% where as the specificity is 55% when other causes of pain abdomen other than symptomatic cholelithiasis when taken into account.

Murphy's sign may be a very useful diagnostic technique whencholecystitis is suspected. Examiners cannot depend on Murphy's sign or sonographic Murphy sign for diagnosis, but must also consider biochemical and imaging studiesA. Each case should be evaluated individually to determine the appropriate diagnosis and treatment plan.

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