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Next Time Think of a Worm!

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Abstract: ***An 81 - year - old male patient presented with complaints of severe abdominal pain and yellowish discolouration of sclera since two days. The pain was insidious on onset, gradually progressive which did not relieve even on medication. The patient also had loss of weight and appetite since past six months. Lab investigations showed increased bilirubin (11.6 mg/dl), prothrombin time (17.5 sec) and total leukocyte count (14, 500 cells/cumm). The patient was advised USG initially to evaluate the cause of the pain which showed central IHBRD with a hyperechoic lesion in the mid CBD causing gross dilatation. Later CT was done which showed obstructive biliary pathology in the distal CBD causing IHBRD. To evaluate further we did MRCP which showed acute cholecystitis with large choledocholithiasis causing obstructive biliopathy. On ERCP there is a ball of dead worms with few live worms in the CBD. Balloon sphincteroplasty with biliary stenting is done.***

Keywords: Ascariasis, calcified, obstructive biliopathy, cholangitis, Roundworm infestation

1. Introduction

Parasites are organisms that live in another organism at the host's expense, sometimes causing harm and disease in the host. Many parasites have complex life cycles with different stages, some involving intermediary hosts besides the final host where the mature or adult form of the parasite lives. The human body can be the definitive, intermediate, or accidental host of several different parasites including protozoa, helminths, arthropods, insects, amongst others. Several human parasites pose a considerable health problem in endemic areas, usually affecting the less developed regions of the world [1]. *Ascaris lumbricoides*, the roundworm, is the most common parasite that infects the human gastrointestinal tract [2]. There are several ways in which intestinal ascariasis can manifest; however, the most serious presentation is biliary ascariasis, which can result in life threatening complications including cholangitis, choledocholithiasis, liver abscesses and pancreatitis. Abdominal ultrasonography (USG) has been shown to have a very high diagnostic accuracy as a non - invasive procedure [3], but some cases need more sophisticated diagnostic techniques including magnetic resonance cholangiopancreatography (MRCP). ERCP, on the other hand, is a useful diagnostic as well as a therapeutic tool. Complicated cases require intervention such as endoscopic extraction of the worms and/or surgery.

2. Case Report

History: An81 - year - old male patient farmer by occupation presented with chief complaints of severe abdominal pain and yellowish discoloration of sclera since two days. The pain was insidious on onset, gradually progressive which did not relieve even on medication. He was a chronic alcoholic and smoker since twenty years. There was a significant weight loss since the past six months. He had no history of any previous comorbidities or surgery. The patient is not yet diagnosed with any malignancy and is not under any treatment at the time of presentation. The patient underwent USG, CT, MRCP abdomen for further evaluation and mainly to rule out malignancy and presentation considering patients age.

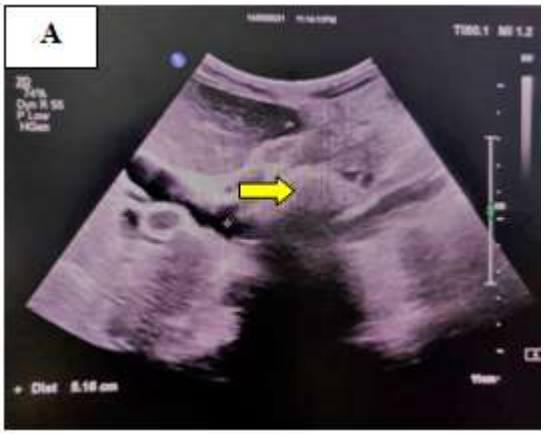
Examination:
a) BP - 110/90 mm of Hg.
b) Temperature: 38 degrees Celsius.
c) Respiratory rate: >24 breaths/ sec.
c) Icterus+ and pallor +

Preliminary Blood Investigations:
a) Haemoglobin: 9.2 mg/dl
b) WBC: 14520 cells/cumm
c) PT: 16.2 sec
d) Total bilirubin: 8.2 mg/dl

Radiological Investigations

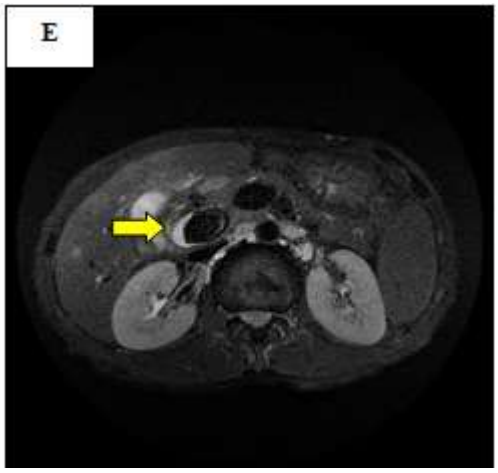
USG Abdomen:
Showed mild hepatomegaly (Right lobe measuring approx 17.5 - 18 cms) with grossly dilated CBD with central IHBRD. There is a round to oval echogenic focus with posterior acoustic shadowing measuring approx 3.5 x 2.8 cms in CBD – f/s/o CBD calculus causing obstructive biliopathy (fig A).
The wall of gall bladder thickened and edematous with no evidence of any definite USG evident mass/ lesion. There is no evidence of any moving structures at the time of scan (fig B).

CT Abdomen:
Showed CBD dilatation of measuring approx 15 mm with a large calculus (3.2 x 1.5 cms) at the distal end. There is IHBR and mildly dilated MPD. Gall bladder wall appeared thickened with thin rim of pericholecystic fluid (fig C).



A: USG showing echogenic focus in CBD with posterior acoustic shadowing (arrow) with grossly dilated CBD.
B: Thickened and edematous wall of gall bladder with minimal sludge in the lumen.

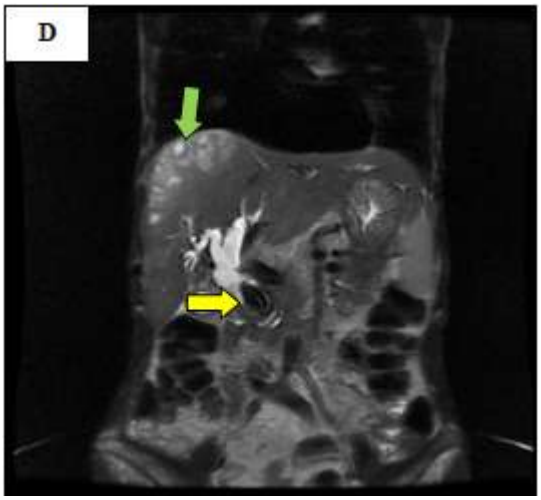
C: NCCT Abdomen showing grossly dilated CBD with a large calcified lesion (arrow) at its distal end causing obstructive biliopathy.



MR Cholangiopancreatography (MRCP):
Liver: Upper normal in size showing multiple similar characteristic T1 hypo and T2 hyper intense lesions in right lobe, predominantly in peripheral parenchyma showing early coalescence. Very few similar signal intensity lesions also noted in left lobe–f/s/o Cholangitis with evolving abscesses.
Gall bladder: Optimally distended showing diffuse wall thickening. Cystic duct appear dilated and tortuous with luminal sludge. No definite calculus seen. Mild sludge also seen in CHD. Regional inflammatory changes with minimal fluid noted at GB fossa, adjoining hepatoflexure and gastro - hepatic region – f/s/o Acute cholecystitis
CBD: There is a large obstructive calculus occupying majority of the CBD, right after cystic duct insertion measuring approx.1.9 x 3 x 3.4cm (AP x W x L) causing upstream dilatation of CHD and diffuse IHBRD in both the lobes of liver – f/s/o Large Choledocholithiasis Causing Obstructive Biliopathy.

Endoscopic Retrograde Cholangiopancreatography (ERCP):

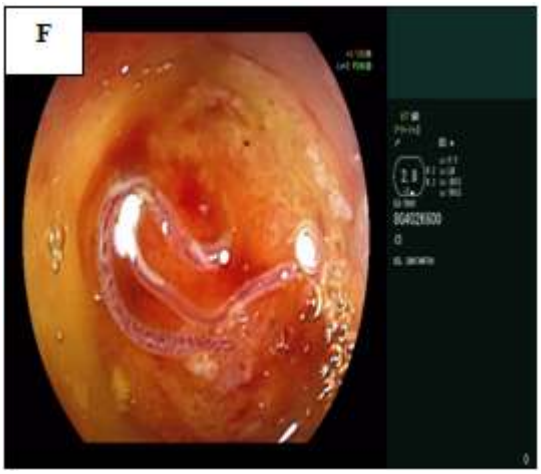
Dilated CBD with a large sludge ball with dead worms at the lower end of CBD. There was deformed duodenal cap with a large diverticulum. Multiple live round worms seen near the papillary orifice. Despite of multiple attempts, worm could not be extracted.
Balloon sphincteroplasty with plastic biliary stent placement done. He had marked relief in symptoms. His bilirubin and serum ALP levels had a progressive fall and he was discharged after 4 days from the hospital without any complication. He was dewormed and is following our OPD.



D: MRI Coronal T2 SSFSE large calculus occupying almost entire CBD (yellow arrow), multiple T1 hypo and T2 hyper intense lesions in right lobe predominantly in peripheral parenchyma – Likely evolving abscesses.

E: MRI Axial T2 FS showslarge CBD calculus markedly hypo intense relative to the surrounding hyper intensebile (yellow arrow).

F: ERCP showing live worms with white creamy frothy yellow coloured material.



3. Discussion

Biliary ascariasis is commonly reported from highly endemic regions like India, Bangladesh, Latin America, parts of the Middle East and Africa [4, 5]. The clinical disease spectrum comprise of pulmonary, intestinal (including intestinal obstruction), appendicular, hepatobiliary and pancreatic ascariasis [6]. Recurrent ductal invasions have been frequently recorded in endemic regions. The diagnosis is made when worms are seen in one of the diagnostic tests.

USG is highly sensitive in the diagnosis of biliary ascariasis, being a noninvasive procedure it is the initial and the most commonly used modality.

Various signs are seen with ultrasonography which are –

1) ***Inner tube sign*** - a thick echogenic stripe representing the worm with a central longitudinal anechoic tube (gastrointestinal tract) in the gall bladder or CBD.
2) ***Stripe sign*** - thin non - shadowing stripe without an inner tube
3) ***Spaghetti sign*** - Overlapping longitudinal interfaces in the main bile duct due to coiling of a single worm or several worms in the CBD [5].

In addition, real time sonography demonstrates moving worms within gall bladder and biliary tract thus equivocally establish the diagnosis [7]. Ultrasonography is also helpful in monitoring the exit of the worms from the biliary tract. The main drawback of ultrasonography is it can not detect worms in the duodenum or the ampullary orifice and thereby has been reported to miss almost upto 50% HBA cases [9]. False - positive diagnoses may arise in the following circumstances. Vague echoes may be seen in the main bile duct due to “blooming” of its well images or reverberations from more anterior tissue interfaces. A strip or spaghetti sign may also be simulated by a curving, angulated main bile duct, together with hepatic artery and adjacent tissue interfaces, going into and out of the scanning plane view; the strip sign of biliary ascariasis requires an unequivocal length of main bile duct lumen to be regarded as positive [8].

MRI and MRCP are not the investigations of choice for nematode infestations since ultrasound is often able to demonstrate the worms. However, in doubtful cases (like this one) and when a pre - ERCP map is necessary for the removing the worms. MRI can serve as a very specific imaging modality by demonstrating the worm size, number, extent of infestation etc. MRCP can demonstrate the extent of the disease in the biliary tract, in addition to revealing any secondary stones, strictures and the status of intrahepatic biliary radicals. MRI also scores over CT since it allows coronal imaging, better delineation of fluid around the worm in the CBD and 3 - D MIP images of the biliary tract using MRCP.

ERCP usually shows the worm as a long - filling defect. Successful extraction of the worm from the CBD via endoscope can be performed by the trained surgeon safely. ERCP as a therapeutic intervention should be considered, if a patient fails to respond to conservative treatment or it the worm persists or has died within the pancreaticobiliary tree Severely ill patients, patients with many co morbid [10] conditions, presence of any coexistent strictures or stones within the biliary ducts are also an indication. CBD exploration, removal of the worm and T - tube drainage is also an option, if the patient fails conservative therapy. Movement of the ascaride out of the biliary tracts coincides with the resolution of symptoms. Therefore, the highest diagnostic yield is achieved when endoscopy is performed soon after the onset of symptoms. Lastly more than 95% of the patients with uncomplicated biliary ascariasis will respond to conservative management itself, the worms return spontaneously to the intestine hence, conservative management should be give utmost [11] importance before or even after any procedure.

4. Conclusion

One should give a thought about biliary Ascariasis as a differential diagnosis for biliary colic, especially in developing countries and endemic areas like India. It can mimic choledocholithiasis due to its coiling nature and also as the dead worms usually form a calcified ball. Investigations such as USG and ERCP are very useful in such cases. USG should be the initial modality of choice due to its availability, low cost and mainly as it is noninvasive real time imaging. Most of the patients recover with pure conservative therapy. Surgery or ERCP is indicated only when conservative therapy fails. Careful removal of worms with proper conservative management is very necessary to avoid serious complications.

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