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# Hepatic Artery Pseudoaneurysm Mimicking Mirizzi Syndrome

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## ABSTRACT

Acute cholecystitis leading to development of a pseudoaneurysm of the hepatic artery is a very rare complication; however, a pseudoaneurysm resulting in gallbladder neck compression with dilatation of intrahepatic duct giving a Mirizzi syndrome like presentation is virtually unreported to the best of our knowledge. We report a case of a 60 years male patient who presented in emergency department with right hypochondrial pain and mild jaundice. Initial diagnosis of hepatic artery pseudoaneurysm causing compression of neck of gallbladder and common bile duct was made on ultrasound examination. This was resulting in gross distention of gallbladder and mild dilatation of intrahepatic ducts. Findings were confirmed on CT scan. Later successful selective transcatheter arterial embolization of the aneurysm and percutaneous cholecystostomy were performed.

**Key words:** *Hepatic artery pseudoaneurysm. Mirizzi syndrome. Transcatheter arterial embolization.*

## INTRODUCTION

Acute cholecystitis is a common clinical condition which can rarely cause pseudoaneurysm of the cystic or hepatic arteries as a life threatening complication.<sup>1,2</sup> This can be due to constant inflammatory process leading to erosion of arterial wall and also result in hemobilia.<sup>3,4</sup> There has been further description of rare case of a pseudoaneurysm of hepatic artery secondary to cholecystitis which ruptured into the gallbladder.<sup>5</sup>

Hepatic artery pseudoaneurysm causing distention of gallbladder and intrahepatic dilatation due to extrinsic pressure over neck and common bile duct is not often seen. This can result in a radiological as well as clinical picture similar to Mirizzi's syndrome as described in this case.

## CASE REPORT

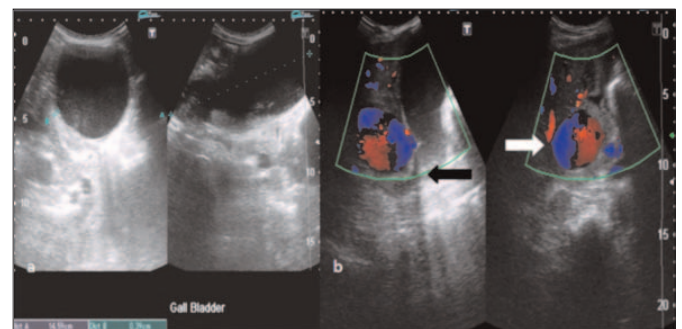
A 60-year-old man presented in emergency with right hypochondrial pain and fever. On physical examination, he had slight icteric sclera and right subcostal tenderness. Past history was significant for infective endocarditis and repeated episodes of liver abscesses for which he underwent multiple aspirations. Recent laboratory investigation showed a raised WBC count of 12.4 ( $4 - 10.0 \times 10^9/L$ ) and haemoglobin of 9.9 (13.7-16.3) gm/dl. His total bilirubin was 2.2 mg/dl (0.1 - 1 mg/dl) with direct bilirubin of 1.8 mg/dl (0 - 0.2 mg/dl). Alkaline phosphatase was raised with a value of 623 IU/L (42 - 121). Previous ultrasound examinations had not shown any cholelithiasis. Present sonogram

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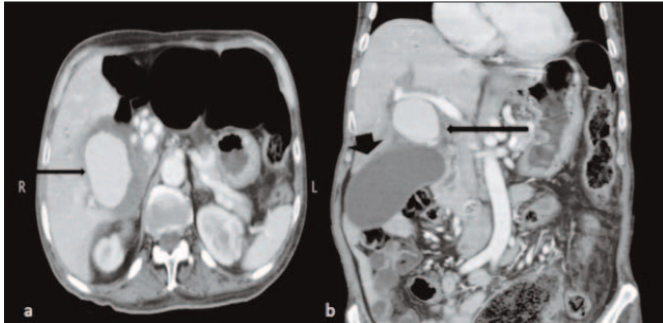


**Figure 1:** (a) Gray scale ultrasound image shows distended gallbladder with thickened wall. Intraluminal echogenic material also seen representing sludge. (b) Color doppler ultrasound image showing well defined area showing bidirectional, swirling, or "yin-yang" color flow characteristic pseudoaneurysm (white arrow). It is causing compression effects in the region of neck of gallbladder (black arrow).

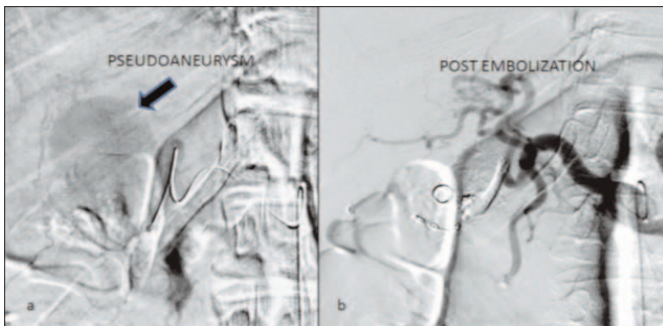
revealed a well-defined tubular cystic lesion at porta hepatis showing predominantly arterial waveform on color Doppler examination suggestive of pseudoaneurysm. It was probably arising from the hepatic artery (Figure 1). The lesion was lying in close proximity to the neck of gallbladder. Gallbladder was significantly distended measuring 14.5 x 7.2 cm in longitudinal and transverse dimension respectively with a wall thickness of 0.4 cm. Sonographic Murphy's sign was positive consistent with acute cholecystitis. Later, abdominal computed tomography scan was performed which confirmed the findings of a large oval shaped partially thrombosed aneurysm arising from posteroinferior branch of right hepatic artery. It measured 5.5 x 8.1 x 7.5 cm with residual lumen measuring 4.2 x 5.5 x 6.4 cm causing extrinsic compression of gallbladder neck, cystic duct and common hepatic duct resulting in distension of gallbladder and also mild intrahepatic biliary dilatation (Figure 2).

Patient was shifted to angiography suite for selective angiography and embolization. Pseudoaneurysm was identified arising from the branch of right hepatic artery

which was successfully embolized with multiple pushable coils and Histoacryl glue. Later, percutaneous cholecystostomy was also performed to relieve the distention. The patient was discharged after 3 days in stable condition with instruction to follow-up with the surgeon.



**Figure 2:** (a) CT scan axial image large pseudoaneurysm (long arrow) with non-enhancing thrombosed part. (b) Coronal image shows markedly distended gallbladder (short arrow) due to extrinsic compression of the pseudoaneurysm. Minimal dilatation of intrahepatic ducts is also seen.



**Figure 3:** (a) Angiogram of the right hepatic artery demonstrate large pseudoaneurysm filling from the branch of right hepatic artery. (b) Post embolisation angiogram revealed complete exclusion of the pseudoaneurysm with platinum coils and histoacryl glue.

## DISCUSSION

Pseudoaneurysm of the hepatic artery is a very rare complication of acute cholecystitis; the reverse scenario of hepatic artery pseudoaneurysm causing acute cholecystitis has not been reported to the best of our knowledge. The cause of hepatic artery pseudoaneurysm in this patient with known infective endocarditis was thought to be multiple liver abscess aspirations in past. This is a relative common and known phenomenon.<sup>6</sup> These patients typically present with a classic triad of upper abdominal pain, obstructive jaundice, and occult or active gastrointestinal (GI) bleeding also referred to as Sandblom's triad.<sup>7</sup> All these are known to occur due to formation of hepatic artery aneurysms, arterio-biliary fistulas, or arteriovenous fistulas secondary to hepatic intervention. Gross GI bleeding was not documented in this case as patient did not undergo endoscopy or surgery, however, the drop of haemoglobin from 13.1 to 9.9 mg/dl over two months was suggestive of occult GI bleeding. The abscess

drainage was done outside our institute so details were not available regarding the procedure.

Possibility of acute cholecystitis as a cause of pseudoaneurysm is remote as there was no evidence of acute cholecystitis, cholelithiasis, definite pericholecystic collection or severe inflammation in recent or prior sonogram and CT. Both sonogram and CT imaging showed the pseudoaneurysm causing pressure over the cystic duct as well as common bile duct which not only led to gross distention of gallbladder but also dilatation of the intrahepatic duct creating a picture similar to that seen in Mirizzi syndrome. A somewhat similar report of case by Shan-Zu Lin *et al.* showed calculus in the neck of the gallbladder, mimicking Mirizzi syndrome, and an adjacent mass with external compression of the common hepatic duct on MRI, which was initially suspected to be neoplasm.<sup>8</sup> However, the surgical findings were of a pseudoaneurysm from the right hepatic artery, protruding into the gallbladder.

Ultrasound may not always be confirmatory as reported in many cases.<sup>9</sup> However, in this patient correct diagnosis was possible due to large size of lesion and the utilization of color Doppler imaging. CT scan study with contrast administration is more definitive for the diagnosis.

Transcatheter arterial embolization (TAE) of the aneurysm before surgical aneurysmorrhaphy is considered safe and effective.<sup>10</sup> Angiography can directly visualize a pseudoaneurysm and extravasation, and offers significant information for diagnosis and treatment. Angiography is very useful in patients with suspected pseudoaneurysm prior to treatment. Embolization with microcoils has been utilized frequently although there are several materials currently available. The authors mostly use pushable (stainless steel/platinum) microcoils to produce permanent vascular occlusion; however, in this case Histoacryl glue was also utilized to achieve complete embolization. Histoacryl has been seen to be quite effective for endovascular treatment of pseudoaneurysm of the common hepatic artery by Garg *et al.*<sup>11</sup> Liver infarction is an important complication of TAE. However, liver has been seen to tolerate considerable embolization because of multiple collateral pathways.

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