

## Bouveret's Syndrome: Radiological Findings

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**Abstract** We present a case report with radiological findings in a patient of 63 years old with findings highly suggestive of Bouveret's Syndrome on abdominal radiograph, USG and CT scan.

**Key Words** Gallstone, ileus, cholecystoduodenal fistula, Gastric outlet obstruction.

### Introduction

Bouveret's syndrome is rare subcategory of gallstone ileus caused by passage of gallstone through cholecystoduodenal fistula and impaction of stone in duodenum resulting into gastric outlet obstruction. It was first described by Leon Bouveret in 1896. Most common location causing gallstone ileus is terminal ileum.

### Case Presentation

A 63 years old patient presented with one week history of upper abdominal pain, nausea, bilious vomiting, anorexia, discomfort in right hypochondrium and epigastrium. Vital signs were stable. Laboratory findings showed electrolyte imbalance, raised liver enzymes but normal bilirubin level. Urea and creatinine level mildly rose.

### Imaging findings

Abdominal radiograph demonstrated curvilinear calcification in right upper

quadrant (figure 1). Paucity of bowel gas seen. Abdominal USG demonstrated distended GB with edematous wall. Lumen showed sludge and few stones. A fistula seen between GB and duodenum with to and fro movement of gut contents noted between GB and duodenum (Figure 2A). Pneumobilia noted (Figure 2B, C). Common bile duct was not clearly visualized.

Abdominal CT after oral and intravenous contrast demonstrated pneumobilia, (Figure 3D) edematous, enhancing Gallbladder wall and calculi within lumen as well as in duodenum (Figure 3A). Fistula seen between GB and duodenum (Figure 3B, C). Stomach was distended with dilution of contrast.



Figure1: Standing AP abdominal X-ray shows curvilinear radio-opaque structure noted in right hypochondrium.

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Figure 2: (A) Axial sonogram shows fistula between gallbladder and duodenum and a large calculus within lumen of GB; (B) Longitudinal sonogram of liver shows pneumobilia as cursor shown between A and B; (C) Axial sonogram shows multiple air foci with ring down artefact within lumen of GB along with echogenic structure with acoustic shadowing suggestive of calculus.

## Discussion

Biliodigestive fistulae are a very rare complication of cholelithiasis, occurring in <1% of all patients. In 60% of cases fistulae are cholecystoduodenal. Formation of fistula depend on long history of cholelithiasis, repeated attack of acute cholecystitis, long size calculus (>2cm), female gender and advanced age. 85% of gallstone eliminated by vomiting or with faeces. 15% of gallstone ileus presents due to impaction of stone at different level of digestive tract. Gallstone ileus, the classic gallstone ileus occurs when gallstone is present in terminal ileum leading to obstruction. This is the most common location of gallstone ileus accounting for 50-90% [1].

Bouveret's syndrome is a type of gallstone ileus in which stone is lodged in duodenum or stomach leading to gastric outlet obstruction. It occurs most commonly in elderly women. Clinical features are variable and include epigastric pain, nausea, vomiting. Minority of patient presents with upper GI hemorrhage with hematemesis secondary to erosion of duodenal and coeliac artery. Other common nonspecific sign are abdominal tenderness, dehydration, abdominal distension and pyrexia. Differential diagnosis includes perforated peptic ulcer, pancreatitis, gastric volvulus and malignant fistula [1-3].

Abdominal radiograph is usually of low diagnostic value. In 30-50% of patient with gallstone ileus, diagnosis is suggested on the basis of clinical presentation and Rigler's triad-bowel obstruction, pneumobilia and ectopic gallstone. Subsequent radiograph may be useful to demonstrate migration of gallstone [4, 5, 6].

Ultrasound may be helpful but often confusing due to limitation by anatomic alteration such as intestinal distension, collapsed or presence of air in gallbladder. When GB is contracted, it is difficult to detect exact location orthoptic or ectopic GB. Common bile duct may not be visualized [2].

The best imaging technique to identify element of Rigler's triad is CT scan. Apart from pneumobilia, intestinal obstruction, ectopic calculus and dilated stomach, CT also depicts biliodigestive fistula. Calculus is seen in duodenum in most of the cases. In 15-25% of patients, its visualization is difficult because of isoattenuation to bile or fluid. Oral contrast improves diagnostic sensitivity of CT scan as it surround gallstone. Pickharde *et al* described use of MRI (MRCP) for diagnosis of Bouveret's syndrome with isoattenuating stones and may be especially helpful in patient unable to tolerate oral contrast material [2, 5].

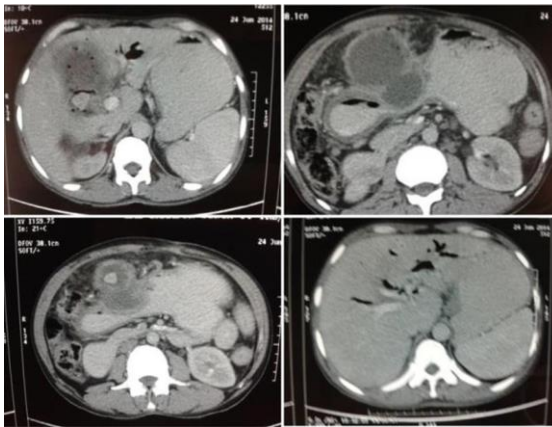


Figure 3: (A) Axial CT scan shows multiple air foci within distended GB along with calculi, pneumobilia and distended stomach; (B) Axial CT scan shows fistula between duodenum and gallbladder with air foci within it and distended stomach; (C) Axial CT scan shows fistula between duodenum and GB with calculus; (D) Axial CT scan shows pneumobilia within biliary radicles of liver

Optimal treatment of patient with Bouveret's syndrome still remain controversial in world literature. Primary goal of treatment is to relieve obstruction by removing the impacted stone. This can be achieved either endoscopically or surgically and other modern technique like endoscopic laser lithotripsy (ILL), extracorporeal shockwave lithotripsy (ESWL) and intracorporeal electrohydraulic lithotripsy (IEHL). Endoscopy play important role due to less invasive character and lower rate of complications. However stones larger than 2.5cm are difficult to extract from endoscopically. Surgery include laposcopic and open approach. Open surgery become indispensable after failure of repeated endoscopic attempt at stone retrieval. The surgical option include one staged approach with enterolithotomy or gastrostomy with concomitant cholecystectomy and repair of fistula. Other surgical option include two staged approach with emergency enterolithotomy to remove obstructing

gallstone and cholecystectomy with fistula repair after a period of recuperation. It seem reasonable to restrict the one staged approach to clinically stable patient and to choose a two staged approach in patient with severe cholecystitis and high perioperative risk as a result concomitant comorbidities. Drawback of lithotripsy procedure are need for prolonged and multiple session, risk of converting proximal gallstone ileus into distal gallstone ileus (as a result of partial fragmentation of stone) and also inadvertent focusing of shockwave on the intestinal wall may cause bleeding and perforation. Sometimes if surgery is preferred, enterolithotomy is adequate treatment in elderly and subsequent cholecystectomy may not be required [1, 3, 7, 8].

As in this case, open surgery with enterolithotomy and extraction of stone was done as endoscopy became fail. Patient recovered smoothly but developed sepsis on sixth post-operative day that was managed successfully. As in this case, large calculus retained in all ladder is an indication for subsequent cholecystectomy and fistula repair.

In summary, Bouveret's syndrome is rare disease (gallstone ileus), its timely diagnosis is important. The diagnosis is made with abdominal radiography, USG but CT and ERCP are most sensitive modality for diagnosis.

#### Authors' contribution

PR: Preparation of the case report, literature review and final revision of manuscript.

RR: Helped in preparation of manuscript.

#### Conflict of interest

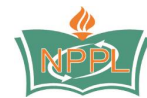
The authors declare that there are no conflicts of interests.

### Ethical consideration

The authors declare that the written informed consent was obtained from the patient for publication of this case report. The copy of consent is available with authors.

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