

## Case Report

### **Gall bladder perforation: A rare complication of Acute Cholecystitis**

Saad Akhtar Khan, Gulfam, Abdul Wahid Anwer, Zeeshan Arshad, Khalid Hameed, Mustafa Shoaib  
Department of Surgery, Ziauddin University Hospital, Karachi.

#### **Abstract**

Gallbladder perforation is a rare but potentially fatal disease and therefore is a dilemma for early diagnosis. It is usually a complication of acute cholecystitis with or without gallstones. We present a case of 70 year old female with abdominal pain and fever. Initial ultrasound revealed cholelithiasis with possible acute cholecystitis. Clinical condition of the patient worsened and suspicion of gallbladder perforation was entertained. Hence, a repeat ultrasound and CT scan was done. Following this a gallbladder perforation was confirmed intra operatively.

#### **Introduction**

Gallbladder perforation is a rare but life threatening complication of acute cholecystitis. It is rarely diagnosed preoperatively, although with a high index of suspicion, awareness, diagnostic procedures such as CT scan and ultrasound scan can help in preoperative diagnosis. However, final diagnosis is usually confirmed at laparotomy. Increase in morbidity and mortality is observed when a definitive diagnosis is delayed.<sup>1</sup>

#### **Case Report**

A seventy year old female presented with three days history of pain in right hypochondrium, fever with chills and rigors. Her vitals at admission were BP: 130/70 mm Hg Pulse: 96 bpm Temp: 101°F Resp.rate: 23/min. Abdominal



Figure-1: CT scan showing subphrenic collection and distended gall bladder.

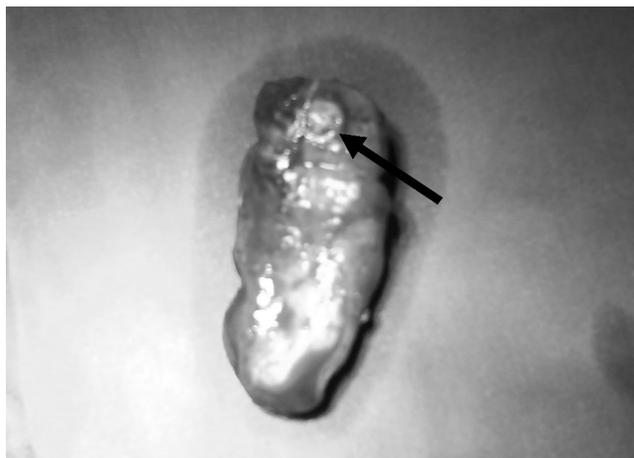


Figure-2: Gross appearance of gall bladder showing perforation at the apex (arrow).

examination revealed tenderness in the right hypochondrium. Rest of the systemic examination was unremarkable. Laboratory studies showed a white cell count of 7,900/mm<sup>3</sup>; haemoglobin of 10.1 gm/dl; haematocrit of 30%; platelets of 109,000/mm<sup>3</sup>; serum K= 2.8 meq/L; serum amylase 16 U/L ; serum lipase 5 U/L; SGPT 10 U/L. Initial sonographic examination of abdomen revealed mildly oedematous gall bladder with wall thickness and a 5mm single calculus measuring 1.4cm in lumen of Gallbladder [GB], suggestive of cholelithiasis and possible acute cholecystitis. Common bile duct [CBD] measured 9mm while rest of the scan was normal. A second U/S scan was requested 24hours later as the patient looked toxic which showed the above findings along with large right subphrenic collection measuring 11.0 x 3.5 cm with 1.3 L of greenish fluid collection, which was aspirated from right perihepatic/ subphrenic region and sent for a detailed report, culture and sensitivity. After aspiration there was again collection of fluid in the subphrenic region on repeat ultrasound which was then again aspirated. Fluid for DR showed LDH: 384 Total.Bilirubin: 9.76, Direct bilirubin: 3.43 and negative culture for any organism. CT of the abdomen revealed evidence of low density collection in right subphrenic region measuring 9.0x2.0 cm in size causing extrinsic pressure on the liver capsule. Findings suggestive of subphrenic collection were present. Gall bladder showed thickening of its wall with stone in it. A diagnostic laparoscopy was done which showed dense adhesions with poor visualization of gall bladder, hence, a laparotomy was done. Findings were of an acutely inflamed

gall bladder with dense adhesions to surrounding structures. Gall bladder was perforated at the fundus. Solitary stone was removed and cholecystectomy done. Suspicion of gall bladder perforation was confirmed intraoperatively. Patient was discharged on 3rd post operative day. Condition was satisfactory on follow up in out patient department.

## Discussion

Perforation of gallbladder occurs in approximately 3% of cases of acute cholecystitis, and is usually associated with the presence of stones. The mortality rate is in the range of 12%-16%.<sup>1</sup> Niemeier classified gallbladder perforation as generalized peritonitis as acute or type I, pericholecystic abscess and localized peritonitis as subacute or type II and cholecystoenteric fistula as chronic or type III.<sup>2</sup>

Perforation results from occlusion of the cystic duct (most often by a calculus) which causes a rise of intraluminal pressure due to retained intraluminal secretion. Increased intraluminal pressure in turn impedes venous and lymphatic drainage causing vascular compromise and therefore leads to necrosis and ultimate perforation of gall bladder.<sup>3</sup>

Infections, malignancy, trauma and drugs (e.g. corticosteroids) and systemic diseases such as diabetes mellitus and atherosclerotic heart disease are predisposing factors.<sup>4</sup>

Fundus is the most distal part with regards to blood supply and therefore this makes it the most common site for perforation which can occur as early as 2 weeks or several weeks after the onset of cholecystitis.<sup>5</sup> In our patient perforation occurred approximately after 24 hours of presentation in the hospital.

Elderly patients are especially susceptible to gallbladder perforation. The incidence of perforation is known to increase fourfold with a delay in surgery of more than 2 days from the onset of abdominal symptoms.<sup>6</sup>

The clinical presentation of gallbladder perforation may range from an acute generalized peritonitis (when fundus is involved) to benign non-specific abdominal symptoms (when fundus is not involved). Clinical differentiation between gallbladder perforation and uncomplicated cholecystitis can often be difficult because the bile leak from a ruptured gallbladder might be contained in the extra peritoneal gallbladder fossa, and hence might not produce symptoms of peritonitis immediately.<sup>7</sup>

Ultrasound findings of gall bladder thickening, distension, pericholecystic fluid and positive sonographic Murphy sign may also sometimes present in gall bladder perforation. The hole sign, in which the defect in the gall bladder

is visualized is the only reliable sign of gall bladder perforation.<sup>8</sup>

As calculi are often missed on CT, sonography followed by CT is preferred in suspected biliary pathology. The crumpled wall of a decompressed gallbladder floating within fluid of the gallbladder fossa has a distinctive appearance and can be seen in some cases of Type 1 perforation. Soiva et al in their study showed that distension of the gallbladder and oedema of its walls may be the earliest signs of impending perforation.<sup>9</sup> Complex pericholecystic fluid collection, focal wall disruption and visualization of gall bladder either within or in the periphery of pericholecystic abscess are findings noted on CT and ultrasonography after gall bladder perforation.<sup>10</sup>

Kim et al in their comparative study of CT and ultrasonography with gallbladder perforation detected the site of perforation in 50% of patients on CT but in no patient on ultrasonography. However, they found both modalities equally effective in demonstrating pericholecystic fluid collections, gallbladder wall thickening and cholelithiasis.<sup>11</sup> Sood et al in 2001 showed a marginally higher rate of detection of gallbladder wall defects on CT than with ultrasonography.<sup>8</sup>

The best form of management is early surgery as delay in surgery increases both mortality and morbidity of patient.

Early diagnosis of gall bladder perforation and immediate surgical intervention are of crucial importance.

Ultrasound scan and CT scan may not help in early diagnosis; however awareness of this condition and a high index of suspicion of perforation of GB should lead to early surgical intervention as emphasized by this case.

## References

1. Simmons TC, Miller C, Weaver R. Spontaneous gallbladder perforation. *Am Surg* 1989; 55: 311-3.
2. Neimeier OW. Acute Free Perforation of Gallbladder. *Ann Surg* 1934; 99: 922-44.
3. Glenn F, Moore SW. Gangrene and perforation of the wall of the gallbladder. *Arch Surg* 1942; 44:677-86.
4. Strohl EL, Diffenbaugh WG, Baker JH, ChemmaMH. Collective reviews: gangrene and perforation of the gallbladder. *Int Abstr Surg* 1962; 114:1-7
5. Isch JH, Finneran JC, Nahrwold DL. Perforation of the gall bladder. *Am J Gastroenterol* 1971; 55: 451-8.
6. Harland C, Mayberry JF, Toghil PJ. Type 1 free perforation of the gallbladder. *J R Soc Med* 1985; 78: 725-8.
7. Sood B, Jain M, Khandelwal N, Singh P, Suri S. MRI of perforated gallbladder. *Australas Radiol* 2002; 46: 438-40.
8. Sood BP, Kalra N, Gupta S, Sidhu R, Gulat M, Khandelwal N, et al. Role of sonography in the diagnosis of gallbladder perforation. *J Clin Ultrasound* 2002; 30: 270-4.
9. Soiva M, Pamilo M, Päivänsalo M, Taavitsainen M, Suramo I. Ultrasonography in acute gallbladder perforation. *Acta Radiol* 1988; 29: 41-4.
10. Gore RM, Yaghami V, Newmark GM, Berlin JW, Miller FH. Imaging benign and malignant disease of the gallbladder. *Radiol Clin North Am* 2002; 40: 1307-23.
11. Kim PN, Lee KS, Kim IY, Bae WK, Lee BH. Gallbladder perforation: comparison of US findings with CT. *Abdomen Imaging* 1994; 19: 239-42.