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Incidence of gall bladder perforation in cases admitted with acute cholecystitis in tertiary care centre, Puducherry

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Abstract

Aim: To present our clinical experience with gallbladder perforation cases in cases admitted with acute cholecystitis.

Methods: Records of 75 patients who received medical and/or surgical treatment with the diagnosis of acute cholecystitis in Sri Venkateswara medical college hospital and research centre, Ariyur, Puducherry between November 2020 to August 2021 were reviewed retrospectively. Five (6.6%) of those patients had gallbladder perforation. The parameters including age, gender, time from the onset of symptoms to the time of surgery, diagnostic procedures, surgical treatment, morbidity, and mortality were evaluated.

Results: One patient had type I gallbladder perforation, 4 type II gallbladder perforation according to Niemeier's classification. The patients underwent surgery after administration of intravenous fluids, analgesics and antibiotics after admission.

Conclusion: Early diagnosis and emergency surgical treatment of gallbladder perforation are of crucial importance. Upper abdominal computerized tomography for acute cholecystitis patients may contribute to the preoperative diagnosis of gallbladder perforation.

Keywords: Acute cholecystitis gallbladder perforation, early diagnosis, computed tomography, emergency surgery

Introduction

Gallbladder perforation (GBP) is a rare but life threatening complication of acute cholecystitis. Sometimes GBP may not be different from uncomplicated acute cholecystitis with high morbidity and mortality rates because of delay in diagnosis^[1-3]. Thus GBP still continues to be an important problem for the surgeons. Most cases can only be diagnosed during surgery^[1, 4]. Acute cholecystitis cases with high fever, high white blood cell (WBC) count, and associated systemic diseases should meticulously investigated^[1, 5, 6]. Niemeier^[7] in 1934, classified free gallbladder perforation and generalized biliary peritonitis as acute or type I GBP, pericholecystic abscess and localized peritonitis as subacute or type II GBP, and cholecystoenteric fistula as chronic or type III GBP. This classification is still in use. We aimed to present our clinical experience with GBP in this study.

Materials and Methods

Subjects

Records of 75 patients who received medical and/or surgical treatment with the diagnosis acute cholecystitis at Sri Venkateswara medical college hospital and research centre, Ariyur, Puducherry between November 2020 and August 2021 were reviewed retrospectively. Five (6.6%) of those patients were found to have gallbladder perforation. Perforations due to trauma, iatrogenic causes, and gallbladder (GB) carcinoma were excluded.

Methods

The original classification of Niemeier^[7] was used to identify the patients. The parameters including age, gender, time from the onset of symptoms to the time of surgery, diagnostic producers, surgical treatment, postoperative morbidity and mortality were evaluated. Direct abdominal X-ray series, abdominal ultrasound scanning (US), abdominal contrast-enhanced computerized tomography (CT), routine blood cell count, and blood chemistry tests were performed.

Peritoneal cavity was lavaged thoroughly with isotonic saline and drains were placed for postoperative drainage in all of the patients.

Results

In our study totally 5 patients had gallbladder perforation (4 male 1 female). The mean age is 50.2.

Type I perforation seen only in one female patient with generalized peritonitis and with high grade fever with x-ray chest and abdomen erect normal, CT abdomen showed free fluid abdomen and intraoperatively patient and multiple perforation involving whole of the gallbladder with necrosed areas.

Type II perforation seen in all other 4 patients with localized tenderness and guarding over the right hypochondrium with abdomen pain and high grade fever. CT abdomen showed pericholecystic fluid collection in all these patients and gall stones in 2 of the 4 patients.

Emergency laparotomy done in all the 5 patients. Intraoperatively most common perforation seen in fundus in 3 patients. Hartman's pouch in 1 patient and multiple in 1 patient. Gall bladder perforation in all patients diagnosed intraoperatively. No patient had type III perforation in our study. The median hospital stay was around 12 days. Two patients had Diabetes mellitus (DM). One female patient with type I perforation had diabetes died in early post operative period due to sepsis and acute respiratory distress syndrome.

Histopathological examination followed for all showed acute calculus cholecystitis in 2 patients, acute cholecystitis in 2 patients and acute on chronic cholecystitis in one patient.

During surgery CBD exploration not done due to dense adhesions. Postoperatively all patients followed with liver function tests found to be normal and ultrasound abdomen (USG) done showed common bile duct not dilated.

Table 1: Data of patients with gallbladder perforation

S. No	Age	M/F	Comorbid	Type of perforation	Site of GB Perforation	CT Findings
1	50	F	DM	TYPE I	Multiple	Intra peritoneal Free fluid
2	60	M	DM	TYPE II	Fundus	Pericholecystic abscess, gallstones
3	45	M	NIL	TYPE II	Fundus	Pericholecystic abscess gallstones
4	52	M	NIL	TYPE II	Hartman's pouch	Pericholecystic abscess gallstones
5	44	M	NIL	TYPE II	Fundus	Pericholecystic abscess

Discussion

Inflammation of gallbladder can lead to ischemia and necrosis leading to perforation in 2-11% of acute cholecystitis patients [6, 8, 9]. It occurs due to impacted calculus obstructing the cystic duct causing increased intracholecystic pressure, epithelial damage, degradation of cell membranes and intense inflammatory reaction. GBP also develops following acalculous cholecystitis, although rare [10, 11]. Acute uncomplicated cholecystitis commonly in females but spontaneous gall bladder perforation seen mostly in male, in our study also gallbladder perforation seen in male: female ratio of 4:1.

Conditions like malignancy, infections, diabetes mellitus, atherosclerosis, prolonged steroid use, immunocompromised status can predispose to gall bladder perforation. In our study two patients had patients had diabetes mellitus. According to Neimerier's classification type I perforation found in one patient with generalized peritonitis and type II perforation found in all other 4 patients in our study. Type II perforation are more common than type I and type III. Type I perforation has high mortality due to late presentation, generalized peritonitis and sepsis. In our study also patient were type I perforation died due to sepsis postoperatively. In our study Type I: Type II: Type III perforation ratio is 1:4:0.

Gall bladder perforation is more common in the fundus due to poor blood supply [8, 12]. In our study 3 patients had perforation at the fundus followed by Hartman's pouch in one patient which are diagnosed intraoperatively. Multiple gall bladder perforation seen in one patient.

Ultrasonographic findings in patients with gall bladder perforation can show gall bladder wall thickening, distension, gall stones, pericholecystic free fluid as seen in acute cholecystitis patients. Sonographic whole sign is only the reliable specific finding of gall bladder perforation seen as gallbladder defect. But it can be seen only in high resolution ultrasound device.

CT abdomen can show more signs of intraperitoneal fluid collections, pericholecystic fluid and abscess. Enhanced CT Abdomen can also detect perforation as a wall defect in

gallbladder. However, study conducted by Kim *et al.* reported that CT abdomen could not visualize perforation in 50% of his cases. In our study CT abdomen showed free fluid abdomen, pericholecystic abscess and gall stones but not the site of perforation. If patients have these clinical signs we should plan emergency surgery as done in our patients since delay in diagnosis and management is the major cause of morbidity and mortality.

Laparotomy with cholecystectomy with abscess drainage and abdominal lavage is sufficient in emergency setup. Cholecystectomy may be difficult in Type III perforation since the patient may need additional surgical procedures like repair of fistula. Cholecystectomy can also be performed in type II perforation after initial percutaneous abscess drainage by ultrasound guidance if available. In our study emergency laparotomy with cholecystectomy done in all five patients.

Laparoscopic cholecystectomy can also be performed in acute, gangrenous perforated cholecystitis. But conversion to open will be needed at any time due to dense adhesions and unclear anatomy.

Conclusion

Gall bladder perforation is a dreadful complication of acute cholecystitis. Though CT abdomen can be used as diagnostic tool for showing signs of gall bladder perforation, in our study all gall bladder wall defect or perforation are diagnosed intraoperatively so early diagnosis and immediate surgical intervention can prevent the morbidity and mortality due to gall bladder perforation.

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