



Study of Clinico- Epidemiological Profile of Patients with Gallbladder Perforation

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Abstract

Background: Gallbladder perforation (GBP) is rare but a potentially fatal disease; its presentation can vary and hence is difficult to diagnose early. It is usually a complication of acute cholecystitis with or without gallstones. Most perforations are subacute, producing a pericholecystic collection. Acute free perforation with biliary peritonitis and chronic perforation with an internal biliary fistula are rare. The fundus of the gallbladder is the most common site of perforation because of its poor blood supply. **Material & Methods:** This retrospective observational study included all cases of gallbladder perforation that presented to general surgery ward from January 2019 to January 2022. Cases of traumatic gallbladder perforation and gangrenous gall bladder were excluded. The patients were assessed for epidemiological and clinical parameters like age, gender, socio economic status, presenting complaints, history of substance abuse, comorbidity, hemoglobin, total leucocyte count, renal function tests, liver function tests, history of fever, fever on presentation, pulse, blood pressure and respiratory rate on presentation, type and site of perforation, method of management, diagnostic procedures (ultrasound and contrast CT abdomen findings), duration of hospital stay, and post-operative complications if any were evaluated. **Results:** This study included 14 patients (4 males and 10 females). The mean age of patients was 63.7 years. Gallbladder perforation was most common in the 5th and 6th decade of life. Two Patients had type I perforation and 12 patients had type II perforation (Neimer's classification). Cases were diagnosed on the basis of contrast enhanced CT scan. Patients were managed with carbapenems, intravenous fluids and analgesics. 11(79%) patients were managed conservatively. One patient presented with impending rupture of anterior abdominal wall abscess that was communicating with pericholecystic abscess. Patients on conservative management were managed empirically with Carbapenem antibiotics and recovered well. Two patients underwent cholecystostomy. The mean hospital stay was 11.5 days for conservatively managed group and 18 days for patients who underwent upfront surgery. There was no reported mortality. All patients underwent interval open cholecystectomy after 06 weeks. Mean post operative hospital stay was 4 days in these patients. Each patient was followed up for 06 months in outpatient department and through telecommunication. **Conclusion:** Gallbladder perforation represents a special diagnostic and surgical challenge. Careful selection and management of patients with broad spectrum antibiotics can help us manage patients conservatively.

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INTRODUCTION

Gallbladder perforation (GBP) is rare but a potentially fatal disease; its presentation can vary and hence is difficult to diagnose early. It is usually a complication of acute cholecystitis with or without gallstones.^[1] Most perforations are subacute, producing a pericholecystic collection. Acute free perforation with biliary peritonitis and chronic perforation with an internal biliary fistula are rare. The fundus of the gallbladder is the most common site of perforation because of its poor blood supply.^[2]

Historically, GBP has been associated with high mortality rate, that ranges from 11% to 26%.^[2] Niemeier, in 1934, classified GBPs into three types: type I (acute) that was associated with generalized biliary peritonitis; type II (subacute) that consisted of the localized collection of fluid at the site of perforation, and it also featured pericholecystic abscess and localized peritonitis; and type III (chronic) that represented the formation of internal or external fistulae.^[3] Once diagnosed GBP mandates early intervention, and cholecystectomy with peritoneal lavage is considered sufficient.^[4] Laproscopic approach is also being increasingly used.

Single centre experience of 14 cases of gallbladder perforation that presented to general surgery ward in a tertiary care hospital from January 2019 to January 2022 is presented here.

MATERIAL AND METHODS

The present retrospective observational study was conducted in surgery ward of a tertiary care hospital in northern India i.e. Guru gobind singh medical college and hospital, faridkot,

Punjab, by including all cases of gallbladder perforation that had presented to our hospital from January 2019 to January 2022. 14 patients with gb perforation were included in the study. Traumatic gb perforation was excluded. Patients had undergone clinical examination, basic hematological and biochemical investigations. In radiological investigations X ray chest postero-anterior view, ultrasound abdomen in emergency setting followed by contrast enhanced abdominal computerized tomography was used.

The patients were assessed for epidemiological and clinical parameters (data collected from record room) like age, gender, socio economic status, presenting complaints, history of substance abuse, co-morbidity, hemoglobin, total leucocyte count, renal function tests, liver function tests, history of fever, fever on presentation, pulse, blood pressure and respiratory rate on presentation, type and site of perforation, method of management, diagnostic procedures (ultrasound and contrast CT abdomen findings), duration of hospital stay, and post-operative complications if any were evaluated.

All patients were admitted in our ward through emergency department of the institute with acute abdomen. Patients presenting with acute pain abdomen, tachypnoea, tachycardia and raised TLC counts were subjected to USG and CT examinations, as well as for a laboratory workup for acute abdomen. The CT and USG diagnostic criteria for GBP were as follows: a thick edematous, gallbladder wall; breach in the wall of gb, pericholecystic collection or localized perihepatic collection; and free intraperitoneal fluid collection with or without extra luminal stones.



Socio economic status was assessed using modified Kuppuswamy scale.

Table 1: Modified kuppuswamy scale

Class	Socio-economic status	No. of patients
I	Upper	-
II	Upper middle	-
III	Lower middle	1
IV	Upper lower	1
V	Lower	12

Inclusion criteria

All patients with gall bladder perforation admitted to our ward.

Table 2: Age.

Variable	Number	Percentage%
<20yr	-	-
21-30 yr	-	-
31-40 yr	1	7
41-50 yr	1	7
51-60 yr	1	7
>60 yr	11	79

Table 3: Sex.

Variable	Number	Percentage%
Male	4	28.5
Female	10	71.5

Table 4: Symptoms and Signs on presentation.

Variable	Number	Percentage%
Pain abdomen	14	100
Fever	12	85
Tachypnoea	14	100
Pallor	12	85
Icterus	4	28
Localised peritonitis	8	57
Generalised peritonitis	3	21

Exclusion criteria

Post traumatic / iatrogenic perforations, type III gall bladder perforations, gall bladder malignancies, gall bladder gangrene and patients who discontinued treatment at the hospital against medical advice and those lost on follow up were excluded from the study.

RESULTS

This study included 14 patients. Maximum no. of patients were above 60 years of age. The mean age of patients was 63.7 years [Table 2].

Of all the presenting patients 71.5% of patients were female [Table 3].

Pain abdomen, tachycardia and tachypnoea were uniformly present while fever was present in 85% of cases [Table 4].

Laboratory investigations

Raised leucocyte counts were present in all cases while anaemia was observed in 85% cases [Table 5]. Lowest haemoglobin on presentation was 6.3g%. Highest recorded total leucocyte count was 30,000/mm³. 5 patients had deranged renal function tests that improved post admission after adequate resuscitation, thus permitting contrast enhanced CT scan at later stage.

Table 5: Liver function tests

Variable	Number	Percentage%
Anaemia	8	57
Raised TLC	14	100
Deranged RFTs	5	35
Deranged LFTs	6	43

Raised bilirubin was observed in 28% cases and all had raised direct component. Alkaline phosphatase was most commonly raised liver enzyme.

Table 6:

Variable	Number	Percentage%
Raised total bilirubin	4	28
Raised sgot,sgpt	5	35
Raised Alp	1	7

USG suggested gall stones in all patients of gb perforation. There was a breach in the wall of gb in almost 40 % of patients as suggested by USG findings (table 6) but CT scan confirmed wall breach in all 14 patients suggestive of GBP [Table 7].

Table 7: USG findings

Variable	Number	Percentage%
Gall stones	14	100
Pericholecystic collection	4	28.5
Distended gall bladder	6	43
Wall breach	5	38
Generalized Peritoneal collection	2	14
Normal common bile duct	6	43
Common bile duct not commentable	8	57

Table 8: CECT findings

Variable	Number	Percentage %
Gall stones	8	57
Pericholecystic collection	8	57
Distended gb	8	57
Wall breach	14	100
Generalised Peritoneal collection	3	21
Common bile duct normal	14	100

86% of patients presented with type II perforation and 80% patients had perforation at the fundus of gb [Table 9].

Table 9: Type and site of perforation

Variable		Number	Percentage %
Type of perforation	Type I	2	14
	Type II	12	86
Site of perforation	Fundus	11	80
	Body	3	20

One patient presented with anterior abdominal wall abscess which is a very rare presentation of GBP. CECT abdomen was done which was suggestive of breach in the wall of gall bladder with subcutaneous extension of abscess which was in continuity with pericholecystic collection. Under anesthesia, surgical drainage of the abscess was done and drain was placed. Patient was then put on conservative management and recovered well to follow up for interval cholecystectomy [Table 10].

Table 10: Management

Variable	Number	Percentage %
Conservative	9	64
Drainage under usg guidance	2	14
Surgical drainage	3	21

During the initial hospital stay, patients who underwent no active surgical intervention, had no new episode of biliary leak or peritonitis. There was no reported mortality. All 14 patients were followed up in OPD after being discharged. All patients managed conservatively underwent interval open cholecystectomy. Average hospital stay post cholecystectomy was 4 days and the course was uneventful.

Table 11: Average hospital stay

Variable	Number of patients	Mean Number of days	Percentage %
Conservative group	11	11.5	79
Surgical group	3	18	21

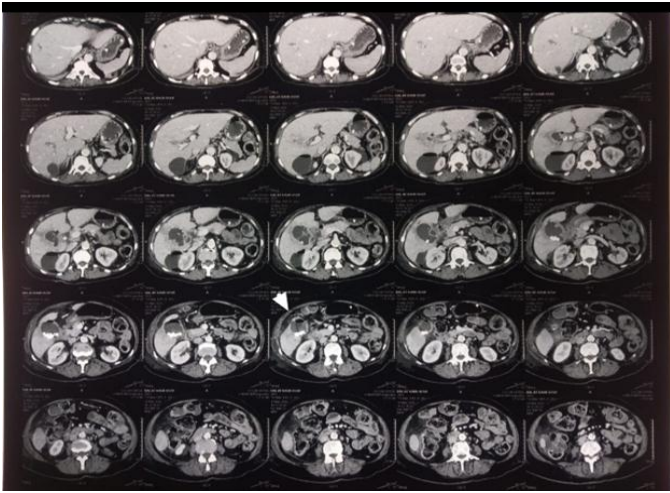


Figure 1: CECT whole abdomen showing Gallbladder perforation(arrow head).

13/14 patients had a Co- existing comorbidity.9/14 had DM an 7/14 were known case of coronary artery disease and 3 patients had both DM and CAD.

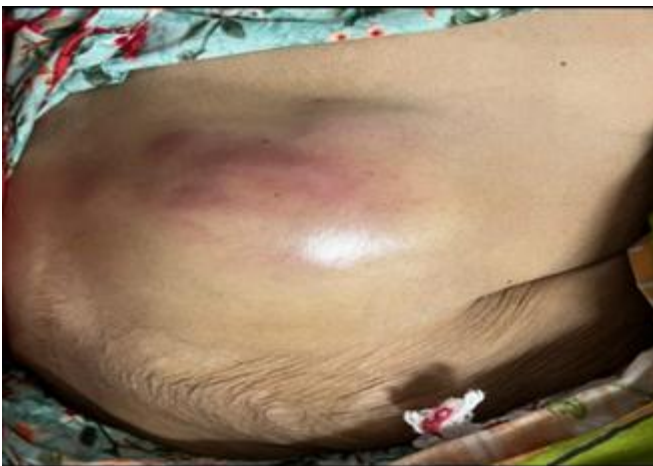


Figure 2: On bed picture of patient showing subcutaneous abscess in right hypochondrium.

Two patient with generalized peritoneal collection underwent cholecystostomy with peritoneal lavage and drainage.



Figure 3: On table picture of patient undergoing cholecystostomy showing foley's being placed as a cholecystostomy tube.

Two patients with localized collection underwent drainage under ultrasound guidance and placement of pigtail catheters of 10F. Catheters were removed on follow up after ultrasound confirmed no residual fluid collection.

DISCUSSION

Gall bladder perforation is a rare complication of acute cholecystitis. During the study period we encountered 14 cases of gall bladder perforation. The cases were between the ages 36-82 years. The most common age group affected was above 60 years. Out of 14 cases, 10 were found to be females and 4 males. Out of 10 female cases, 8 were in the age group of above 60 years. This observation was slightly different from a study conducted by Nandyala VN et al.^[6] In their study, the commonest age group being affected was between 48-60 years with females being more affected within 38-48 years of age. A contradictory finding was seen in the study

conducted by Derici H et al, where males were affected more than females with GBP.^[7]

The youngest patient with gall bladder perforation was a 36-year-old female and the eldest patient was a 82-year-old male in present study.

A total of 65 % of the cases had diabetes mellitus in this study. This verifies the fact that diabetes mellitus can lead to empyema of gall bladder following acute cholecystitis. This was a serious risk factor for gall bladder perforation.

The other comorbidities seen were hypertension (50%) and ischaemic heart disease (50%). Most of the cases in this study belonged to elderly age group. This could be the reason for higher prevalence of comorbidities. Thus, elderly patients with multiple comorbidities are at a higher risk of developing a catastrophic complication like gall bladder perforation.^[8,9,10,11]

Clinical presentations of these patients were ambiguous. Pain abdomen, tachycardia and tachypnea were present in all the cases in this study. To our surprise pallor and fever was present in 85% cases and so was the fever. 28% cases presented with clinical jaundice which was confirmed by laboratory investigation. Only one case presented with obstructive features.

One patient presented with subcutaneous abscess formation in the right hypochondrium (clinical finding) (figure B) which was communicating with the pericholecystic collection (CECT abdomen finding). Similar case was reported by Misiakos E.^[8] In 14% of the cases signs of diffuse

peritonitis was observed and guarding in right hypochondrium was elicited.

The site of GBP was located at the fundus in 80% of the cases, owing to the fact that fundus is the distal most part of gall bladder with respect to blood supply and hence easily prone to perforate. Next common site for GBP was found to be body. This is in agreement with various other similar studies showing fundus as the most common site.^[5,6,8]

The incidence of type II and type I GBP was found to be 86% and 14% respectively. We did not come across any type III GBP during the study period. In similar studies conducted by Derici H et al, and Jain S et al, type II was found to be more common followed by type I.^[6,8] This is in contrary to the study done by Nandyala VN et al, in which type I was more common than type II.^[5]

On clinical examination, most of the patients with type II GBP had guarding present in the right hypochondrium (n=4/12) and an USG finding of pericholecystic collection (n=4/12), whereas patients with type I GBP had diffuse guarding (n=2/14) and free fluid in the peritoneal cavity on USG (n=2/14).

USG was done for all the 14 cases, in which positive finding for GBP was seen in 5/14 cases.

CT abdomen was done for all clinically suspected cases of GBP. CT abdomen confirmed breach in gb wall in all 14 cases. CT abdomen though an expensive investigation, was found to be a better tool for diagnosing GBP.

All the patients had polymorphonuclear leucocytosis. Jaundice was present only in 5/14 cases. Anemia was present in 57% cases, making

it a significant finding there was no reported mortality in this study.

CONCLUSIONS

Gallbladder perforation represents a special diagnostic and surgical challenge. High degree of suspicion should be made in elderly patients

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