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Case Series of Spontaneous Gall Bladder Perforation: Challenges in its Diagnosis and Management

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ABSTRACT

Background
Asymptomatic cholelithiasis is a frequent condition which affects up to 10% of the adult population. Acute cholecystitis develops in up to 2% of patients affected by asymptomatic cholelithiasis. Gallbladder perforation (GBP) develops in up to 2 to 11% of acute cholecystitis cases. Based on Niemeier classification GBP is classified into 3 types, type II being most common presentation.

Methods
Retrospective descriptive case series of all patient presenting with signs and symptoms of cholecystitis and was diagnosed with GBP radiologically was included in the study from the year February 2022 to January 2024 in the Krishna Rajendra hospital of Mysore medical college and research institute Mysore.
Common clinical presentation in these patients were abdominal pain mainly in upper quadrant, nausea, jaundice, tenderness over the right upper quadrant, fever and peritonitis.

Results
Total 43 patients were studied; Out of which 51.2% were males and 48.8% were females. 76.7% had cholelithiasis. Gall bladder perforation was classified into 3 types based on NIEMEIER classification, type 2 being the most common (88.4%). Most people underwent conservative

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management (70%) followed by pigtail & percutaneous cholecystostomy .2 patient succumbed to death out of 43 patients.

Conclusion

Gallbladder perforation even though rare but should be considered in case of cholecystitis and further it should be classified based on Niemeier's classification and should be treated accordingly. Failure in diagnosis and management will lead to mortality and morbidity of the patient.

Key words: Gall bladder perforation, Niemeier, Cholecystitis, Cholelithiasis.

INTRODUCTION

Asymptomatic cholelithiasis is a very frequent condition which affects up to 10% of the adult population. Acute cholecystitis develops in up to 2% of patients affected by asymptomatic cholelithiasis. Gallbladder perforation (GBP) accounts to be in 2 to 11% of acute cholecystitis cases.[1]

Gall bladder perforation is almost an exclusive complication of cholecystitis, could be calculous or acalculous cholecystitis. The diagnosis is frequently missed[2], the acute cholecystitis generally presents with high fever, leukocytosis, and associated systemic diseases should be meticulously investigated for gall bladder perforation.[2]

The diagnosis of spontaneous perforation of gall bladder is very challenging and requires a high degree of clinical suspicion, and it carries a high morbidity and mortality if left untreated.[3]

Late surgical intervention has been suggested as the cause for the high morbidity and mortality in gall bladder perforation complication and improved outcomes have been shown as a result of cholecystectomy within 72 hours. A standard management approach involves a fine balance between the diagnostic and interventional services for these patients.[4]

In 1934, Niemeier classified the condition into three types: type I, acute perforation into the free peritoneal cavity causing biliary peritonitis; type II, subacute perforation with abscess formation; and type III, chronic perforation with fistula formation between the gallbladder and another viscus.[5]

Gallbladder perforation is a dangerous complication of acute cholecystitis that is associated with a high mortality rate.[6] Early detection of gallbladder perforation reduces the associated mortality and morbidity rates.[7]

AIMS AND OBJECTIVES

- To study the correlation of cholelithiasis/cholecystitis associated with gall bladder perforation.
- To study the management of gall bladder perforation based on NIEMEIR classification.

MATERIALS AND METHODS

Retrospective descriptive case series of all patient presenting with signs and symptoms of cholecystitis and was diagnosed with GBP radiologically was included in the study from the year February 2022 to January 2024 in the Krishna Rajendra hospital of Mysore medical college and research institute Mysore.

Sample size of 43 cases were studied who presented with symptoms suggestive of acute cholecystitis and was ultrasonographically some were diagnosed as gall bladder perforation and for confirmation underwent contrast enhanced computed tomography showing evidence of gall bladder perforation was included in the study.

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The studies was retrospectively analysed over the period of 2 years. All the patient who was radiologically diagnosed as GBP was included in the study and management of the patient was studied.

The demographic details, clinical presentation, comorbidities, associated risk factors, general physical examination of patient at the time of presentation to casualty, ultrasonography and CECT corelation of the gall bladder perforation, and management of the GBP was included in the study.

Study design

Retrospective descriptive study of case series of gall bladder perforation.

Study duration

Case series of GBP was collected between February 2022 to January 2024 over the period of 2 years.

Study Area

The present study was conducted in the Department of General Surgery Mysore Medical College and Research Institute, Mysuru.

Source of data

All patients presenting with acute cholecystitis and was radiologically diagnosed as GBP who was admitted at Department of General Surgery, Mysore Medical College and Research Institute, Mysuru were studied.

Sample size

Total size of 43 patients were retrospective analyzed.

Inclusion criteria

All the patient presented with acute cholecystitis and radiologically diagnosed with gall bladder perforation radiologically.

Age above 18 years

Exclusion criteria

Incidentally detected gall bladder perforation without signs & symptoms of cholecystitis.

RESULTS

43 patients were retrospectively analysed those who presented with cholecystitis and radiologically diagnosed as Gall bladder perforation.

Mean average was 55.3(Range 30-86) (Figure 1). Out of 43 patients the Female and male were 22 & 21 respectively. (Table 1)

Their main complaints were pain abdomen (100%) , followed by nausea/vomiting , fever, jaundice, associated with dyspepsia, loss of appetite etc (Figure 2) .The associated risk factor or associated comorbid condition was also studied in GBP patient, most of them were hypertensive

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(22) and diabetic(21), followed by followed by hypothyroidism, IHD,etc.. Nine of them had no known comorbidities. (Figure 3)

Based on the clinical symptoms, patient was initially diagnosed as acute cholecystitis (65.4%), followed by acute pancreatitis (Figure 4). Cholelithiasis was seen in 33 patients out of 43.

All the patient underwent erect Xray abdomen and ultrasound. erect x-ray abdomen was done to rule out other acute abdomen conditions like hollow viscous perforation, intestinal obstruction, and ultrasound was done in view to assess the GB anatomy, other solid organ, to assess the free fluid in peritoneal cavity. About 22-23 patient was diagnosed with gall bladder perforation by ultrasound, other had imminent sign of breech in bladder.

All the patient with confirmed GBP and doubtful cholecystitis underwent CECT abdomen and was diagnosed as GBP. Most of them had breech in fundus of GBP.

Based of NIEMEIER, GBP was classified into 3 types, 38 patient has type 2 where is subhepatic collection, 4 had type 1 GBP where there is extensive free fluid suggestive of biliary peritonitis,. All the 4 patients underwent exploratory laparotomy with total/subtotal cholecystectomy with peritoneal lavage. Out of 4, 2 patients succumbed to death due to sepsis & multiorgan failure(Figure 5).

Laboratory analysis of GB perforation showed that 12 patient has anaemia and 22 patient has leuccytosis.7 patient had jaundice(Table 1)

Out of 38 patients with type 2 perforation 8 underwent ultrasound guided drainage procedure, 4 of them underwent ultrasound guided pigtail(16French) placement in subhepatic space, 4 of them underwent ultrasound guided percutaneous cholecystostomy and was confirmed position of catheter by CT SCAN. And later all 4 underwent interval cholecystectomy.

30 of the GBP were conservative managed with Antibiotics, Analgesic, Ryles tube insertion, Routine blood investigation with ICU care and was discharged and advised Interval cholecystectomy(Figure 6). 22 patient patients underwent interval cholecystectomy(Figure 7).

Sex	
Male	21(49.8%)
Female	22(51.2%)
Cholelithiasis	
Yes	33(76.7%)
No	10(23.3%)
Niemeier Type	
Type 1	4(9.4%)
Type 2	38(88.3%)

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Type 3	1(2.3%)
Anemia	
Yes	12(27.9%)
No	31(72.1%)
Jaundice	
Yes	7(16.3%)
No	36(83.7%)
Leucocytosis	
Yes	22(51.1%)
No	21(48.9%)

Table 1

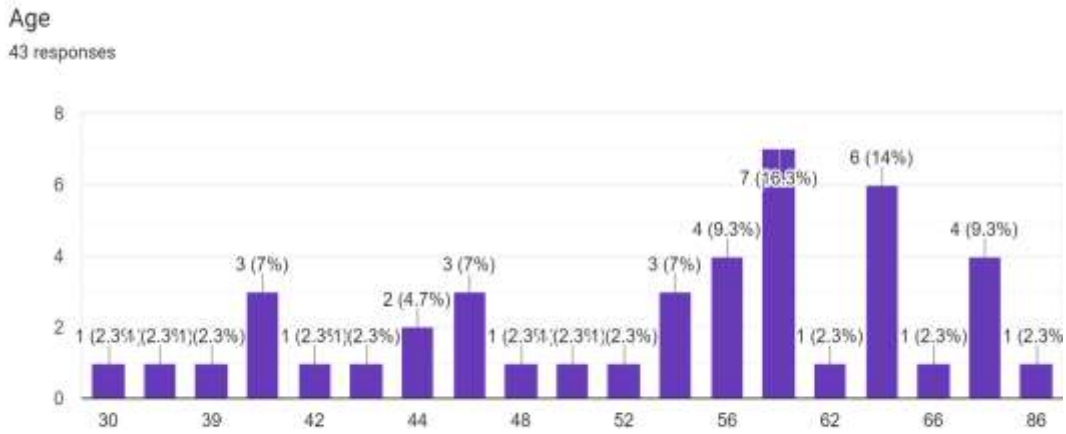

Figure 1

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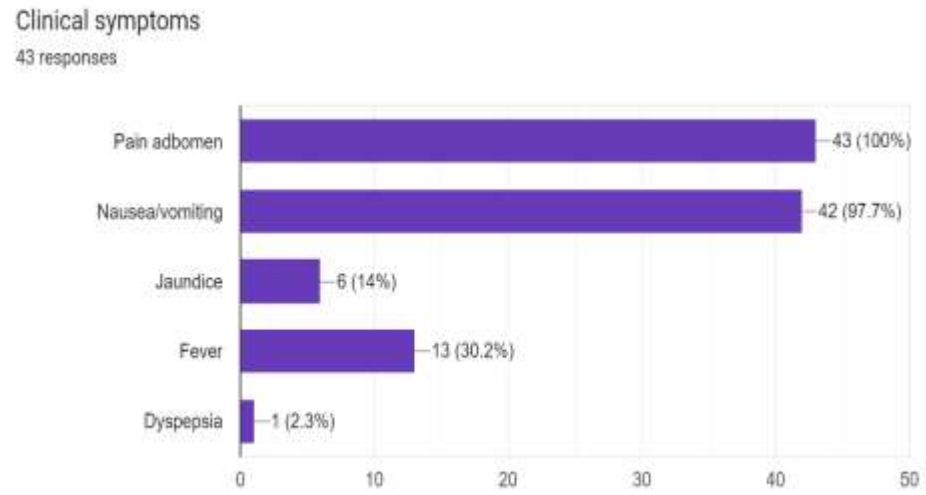

Figure 2

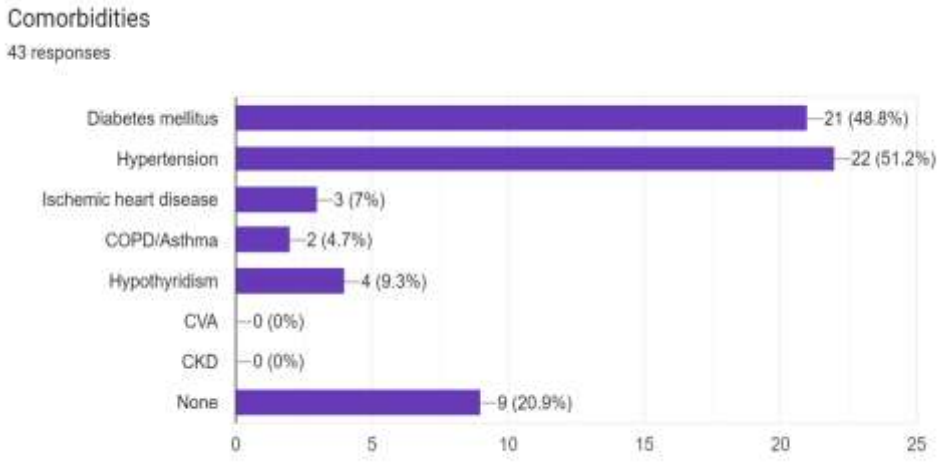

Figure 3

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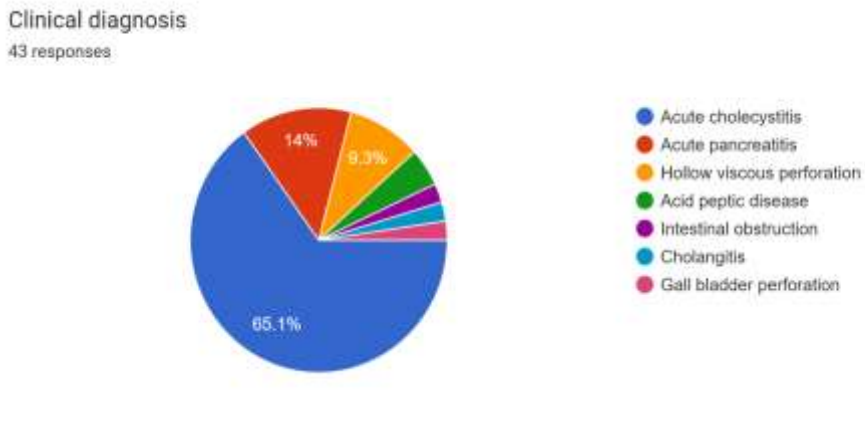

Figure 4

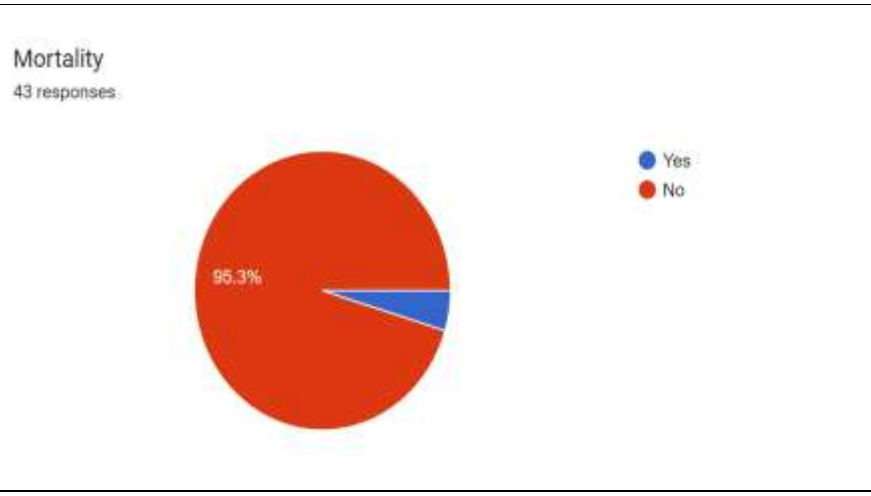

Figure 5

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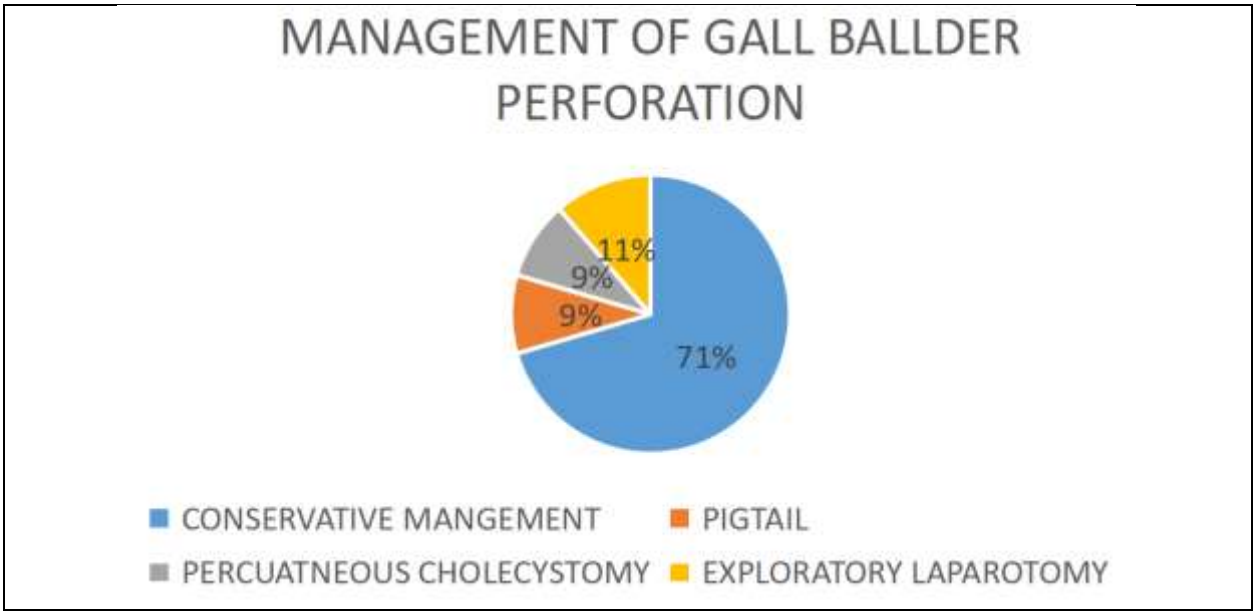

Figure 6

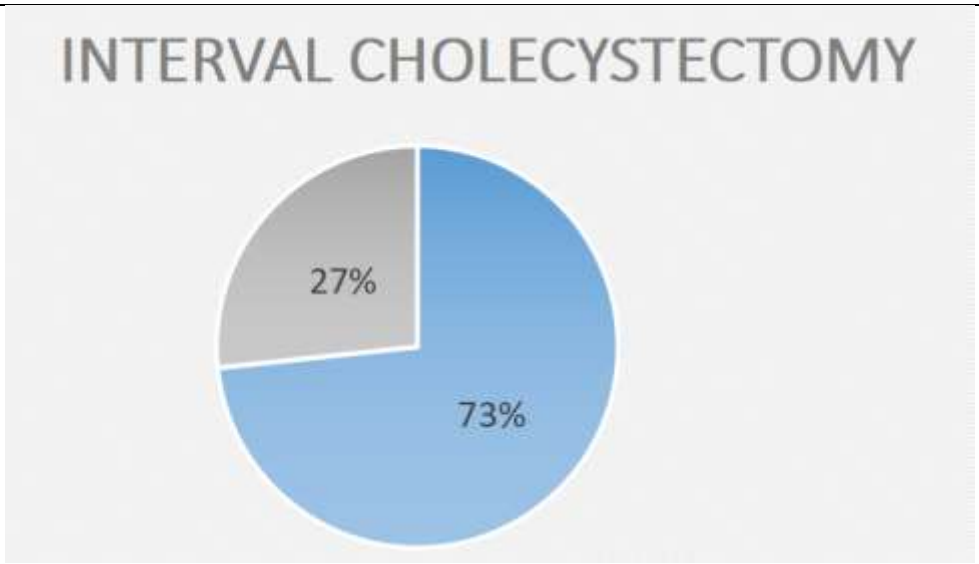

Figure 7

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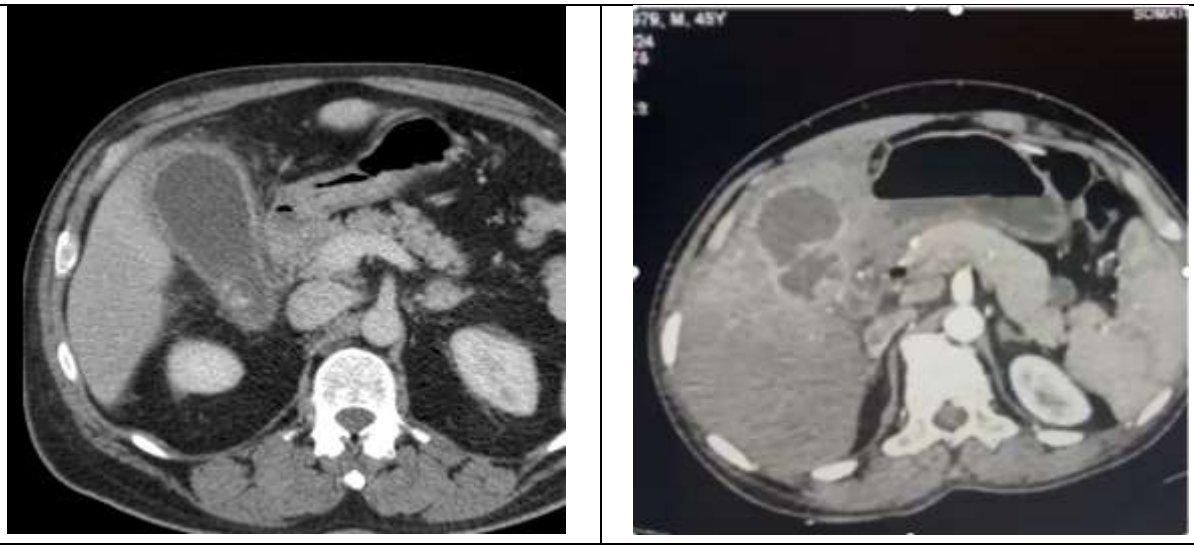

Images 1: Contrast enhanced CT images of GBP

DISCUSSION

GBP was common seen in elderly patient with almost equal distribution between male and female. In the study conducted by Rosyln J & Bedraili showed male predominance.[8.9] Cholelithiasis was seen in about 3/4th of the patient with GBP and acalculous was seen in about 10 patients, Out of 10 patient with acalculous cholecystitis 8 were diabetic and 6 had hypertension and they presented with peritonitis secondary to GBP.[10,11]

Classification of GBP was done according to NEIMEIER and corresponding classified into 3 types.[5] Type 2 being the commonest presentation and management varied according to its presentation.[12]

Inflammation may progress and cause ischemia and necrosis, thus resulting GBP in 2% to 11% of acute cholecystitis patients. GBP also develops following acalculous cholecystitis, The fundus of the gall bladder is the most common site of perforation, presumably because of its poor blood supply.[10]

Out of 43 GBP. Nearly 60% had a runt in the GB fundus leading to GBP, when compared to other study.[13]

When GB is perforated at the fundus, it is unlikely to be covered by the omentum, thus the bile drains into the peritoneal space. If the perforation site is not at the fundus, it sealed by the omentum and the condition remains limited in the right upper quadrant with formation of a pericholecystic fluid.[14] This observation suggests that if the perforation site is at the fundus, it is more likely to end up with a type I perforation causing Acute biliary Peritonitis, in our study all 4 GBP with type I had a defect in fundus causing GBP.[15]

Perforation can develop early in the course of acute cholecystitis (one or two days) or it may even occur several weeks after onset. Perforation and abscess formation should be suspected in those patients with acute cholecystitis who suddenly become toxic and whose clinical condition is found to deteriorate rapidly.[16]

Sonographic findings include wall thickening (>3 mm), distension (largest diameter >3.5-4.0 cm), gallstones, coarse intracholecystic echogenic debris and bile duct dilatation.[17]

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Distention of the gallbladder and edema of its wall may be the earliest detectable signs of imminent perforation. The 'hole sign' (a defect in the gallbladder wall) is the most specific finding.[18]

CECT is more accurate to identify free intraperitoneal fluid, pericholecystic fluid, and abscess. It can detect GB wall thickness and the defect on the wall due to perforation with exact location and dimension of the defect. In our study, 4 patient was diagnosed as GBP on CECT, which the diagnosis was not detected in Ultrasonography of Abdomen.[19]

The Majority of the patient with type 2 GBP was conservatively managed and later underwent Interval cholecystectomy and to drain the pericholecystic fluid and abscess either pigtail was placed in subhepatic space or percutaneous cholecystostomy was done in case of type 2 GBP.[20]

The patient presented with Type 1 GBP underwent Exploratory laparotomy with cholecystectomy and peritoneal lavage was done. Due to sepsis with MODS 2 patient succumbed to death postoperatively, Mortality was due to delayed presentation to casualty, old age, comorbidities with associated sepsis.[21,22]

CONCLUSION

Gallbladder perforation even though rare but should be considered in case of cholecystitis and further it should be classified based on Niemeier's classification and should be treated accordingly.

Failure in diagnosis and management will lead to mortality and morbidity of the patient [8]. Gallbladder Perforation management varied in these case study as most of the time diagnosis will be missed because of its varied presentation

The most important diagnostic tool is an early CT scan, followed by cholecystectomy on an emergency basis.

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