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RESEARCH ARTICLE

GALLBLADDER PERFORATION: EXPERIENCE OF 35 CASES AT A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Gall bladder stone disease is one of the commonest hepatobiliary disease encountered in any general surgical outdoor worldwide especially in fertile females who are obese and in their 4th or 5th decade of life. One of the complications can be gallbladder perforation, although can be a sequel to acalcular cholecystitis. In India, incidence of Gall bladder perforation is estimated to be around 4%. There has been a marked increase in the incidence of the gallstone in the West during the past century.

Material and Methods: The aim of our study was to highlight the Etiopathogenesis, Diagnosis, Management and Complications of gall bladder perforations.

Results: In our study 35 patients were studied ageing between 25-80 years of age with a mean age of 54.3+14.53 years. Majority of our study patients i.e. 13 (37.1%) aged >60 years. Type 2 GB perforation was seen in 30 (85.7%) patients, followed by Type 1 in 3 (86% patients while as 2 (5.7%) patients were found to have Type 3 GB perforation. Percutaneous drainage of gall bladder was done in majority 30 (85.7%) patients.

Conclusion: Type II gallbladder perforation is the most common type. Contrast- enhanced CT has an important role in diagnosing gallbladder perforation. Early suspicion, diagnosis, and appropriate management are of crucial importance for a better outcome in patients with gall bladder perforation.

Introduction:-

Gall bladder stone disease is one of the commonest hepatobiliary disease encountered in any general surgical outdoor worldwide especially in fertile females who are obese and in their 4th or 5th decade of life. Apart from cholecystitis and malignancy one of the complications can be gallbladder perforation, although can be a sequel to acalcular cholecystitis[1]. The prevalence of gallbladder stone varies widely in different parts of the world. In India it is estimated to be around 4%. There has been a marked increase in the incidence of the gallstone in the West during the past century[2]. Highest prevalence is seen in Pima Indian tribe of Arizona with total male and female prevalence of 49% and 73% respectively[2,3].

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Gallstones are composed mainly of cholesterol, bilirubin, and calcium salts, with smaller amounts of protein and other materials[4]. Non- cholesterol stones are categorized as black or brown pigment stones, consisting of calcium salts of bilirubin. Black pigment stones are believed to consist of polymers of bilirubin, with large amounts of mucin glycoproteins. Brown pigment stones are made up of calcium salts of unconjugated bilirubin, with variable amounts of protein and cholesterol[5].

Perforation of gallbladder is not an uncommon complication of the gallstone disease, being present in approximately 3% of all patients undergoing cholecystectomy. The complications has been documented to occur more frequently in elder patients. The presentation may be one of generalized peritonitis of unknown cause[6]. Urgent surgery is essential. Sonography should be the first-line imaging modality for evaluating the patients in these cases. Ischaemia and infection can lead to patchy gangrene which may be walled off by the omentum, duodenum and small bowel or this may progress to a pericholecystic abscess. These patients are very toxic and again surgery is essential.

Niemeier in 1934, classified gall bladder perforation in three categories:
Type I (Acute): Free perforation with generalized peritonitis
Type II (Sub-Acute): Localized peritonitis
Type III (Chronic): Cholecysto-enteric fistula of gall bladder with or without intestinal obstruction (gallstone ileus).[7,8,9-14].

Type Ⅰ gallbladder perforations are usually seen in patients with Atherosclerotic heart disease, diabetes, malignancy, cirrhosis, and immunosupressive diseases, or during immunosupressive treatment, without a history of chronic cholecystitis. On the other hand, type Ⅲ gallbladder perforations most often occur in patients with a previous long time history of gall stones[11,15,16].

Ultrasound of the abdomen is the initial investigation of choice in patients with gallbladder disease. Ultrasound shows pericholecystic fluid collection(s) with a layering of the gallbladder wall in a patient with GBP[17]. The most specific sign of GBP is the "sonographic-hole" sign (gallbladder wall defect can be visualized on ultrasound) and the visualization of gallstones outside of the gallbladder[18]. CECT scan shows the site, size and, number of perforations more accurately thus demonstrate the extension of a lesion more clearly[19]. In comparison to the ultrasound CT scan is more sensitive for the detection of the perforation[17,20,21].

Treatment depends upon the type of perforation.
Type I:- Emergency laparotomy with peritoneal lavage with cholecystectomy or cholecystostomy.
Type II:- Resuscitation/NPO/ I.V fluids and antibiotics – If not improved emergency laparotomy and cholecystectomy or cholecystostomy.
Type III:- Elective open / laparoscopic exploration.

Material And Methods:-

The aim of our study was to highlight the Etiopathogenesis, Diagnosis, Management and Complications of gall bladder perforations. After obtaining the ethical clearance from the Institutional Ethical Committee, the present hospital based, observational study was conducted in the Postgraduate Department of General Surgery, Government Medical College, Srinagar over a period of 18 months.

Inclusion criteria
All patients with gall bladder perforation presenting with clinico- radiological evidence of gallbladder perforation admitted to hospital were studied until their discharge from hospital.

Exclusion criteria
1. Gallbladder malignancies
2. Iatrogenic perforations
3. Traumatic perforations

A detailed symptomatic history and clinical features of all those patients presenting to emergency department was well classified and treated accordingly. Complete physical examination was performed during initial assessment followed by routine investigation on all patients like CBC, LFT, KFT, serum electrolytes, serology, blood sugar

levels, ECG, X-RAY chest and abdomen. Patients were further subjected to special radiological investigations like USG abdomen and pelvis and CECT abdomen and pelvis for confirming diagnosis.

Statistical Methods:-

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean±SD and categorical variables were summarized as frequencies and percentages. Graphically the data was presented by bar diagrams. Student's independent t-test or Mann-Whitney U-test, whichever feasible, was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was applied for comparing categorical variables. A P-value of less than 0.05 was considered statistically significant. All P-values were two tailed.

Results:-

In our study 35 patients were studied ageing between 25-80 years of age with a mean age of 54.3+14.53 years. Majority of our study patients i.e. 13 (37.1%) aged >60 years followed by 10 (28.6%) patients who belonged to the age group of 50-59 years. 7 (20%) patients aged between 40-49 years while as only 5 (14.3%) patients aged <40 years (Table 1).

Table 1:- Age distribution of study patients.

Age (Years)	Number	Percentage
< 40	5	14.3
40-49	7	20.0
50-59	10	28.6
≥ 60	13	37.1
Total	35	100
Mean±SD (Range)=54.3±14.53 (25-80)		

The male : female ratio was 1 : 1. There were 32 (91.4%) patients with calcular cholecystitis while as only 3 (8.6%) patients had acalcular cholecystitis. In our study 34 had underlying comorbid illnesses. Diabetes mellitus was seen in 18 (51.4%) patients followed by hypertension in 10 (28.6%) patients, 4 (11.4%) had COPD while as 1 (2.9%) each patient has CKD and hypothyroidism.

In Our study Type 2 GB perforation was seen in 30 (85.7%) patients, followed by Type 1 in 3 (86% patients while as 2 (5.7%) patients were found to have Type 3 GB perforation (Figure 1).

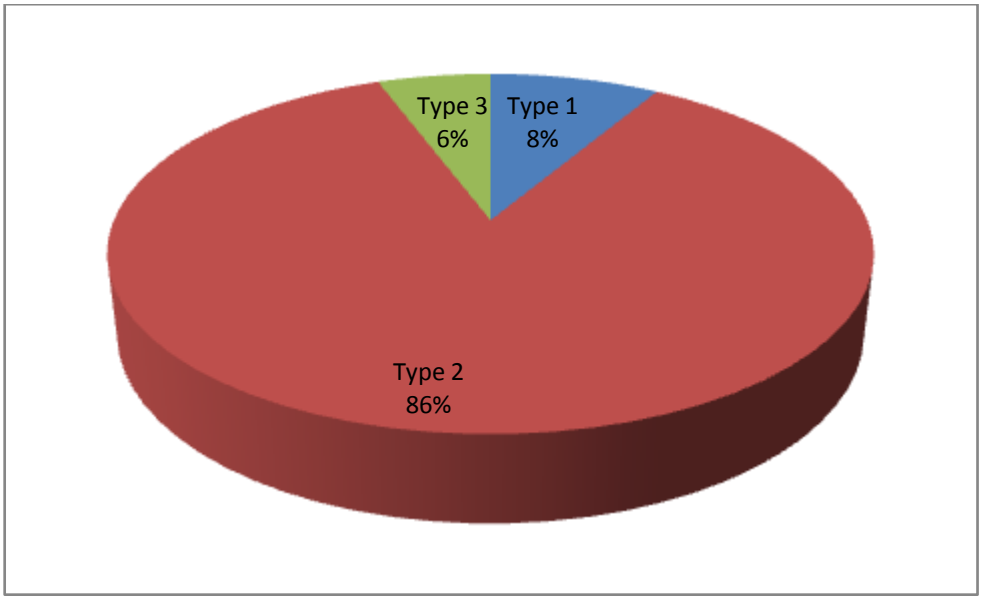

Figure 1:- showing Type of Gall bladder perforation.

Percutaneous drainage of gall bladder was done in 30 (85.7%) patients, 3 (8.6%) patients underwent emergency laparotomy with peritoneal lavage with cholecystostomy while as laparoscopic cholecystectomy with repair of fistula in 2 (5.7%) patients. Postoperative hospital stay in our study patients ranged between 5- 14 days with a median of 7 days. Duration of hospital stay in majority of patients i.e. 19 (54.3%) was 7-10 days, 12 (34.3%) patients needed <7 days hospitalization while as >10 days hospitalization was required by 4 (11.4%) patients. Complications were encountered in 8 patients including peritonitis in 3 (8.6%) patients, sepsis in 2 (5.7%) patients, cholecyto-enteric fistula in 2 (5.7%) with pleural effusion in 1 (2.9%).

Discussion:-

In patients with acute cholecystitis, inflammation progresses causing ischemia and necrosis resulting in gall bladder perforation. Gall bladder fundus, the most distal part with regard to blood supply is the most common site of perforation[16].

In our study, 35 patients were studied ageing between 25-80 years of age with a mean age of 54.3+14.53 years. Majority of our study patients i.e. 13 (37.1%) aged >60 years followed by 10 (28.6%) patients who belonged to the age group of 50-59 years. 7 (20%) patients aged between 40-49 years while as only 5 (14.3%) patients aged <40 years with 18 (51.4%) males and 17 (48.6%) females. **Nandyala VNR et al., (2016)[22]** analyzed 18 patients who underwent emergency laparotomy for gallbladder perforation over a period of two years. In their study, patients age ranged between 18-60 years with majority of them being 48-60 years of age (n=9) followed by 7 patients who were aged between 38-48 years with 11 males and 7 females. **Tubachi P et al., (2018)[23]** conducted a study on 583 patients who underwent laparoscopic or open cholecystectomy with perforated gallbladder incidence of 1.9% (n=11). Of these 11 patients, 9 aged more than 50 years with 8 males and 3 females.

There were 32 (91.4%) patients with calcular cholecystitis while as only 3 (8.6%) patients had acalcular cholecystitis. The incidence of gallbladder perforation in acute cholecystitis has been reported to range from 2 to 18% and in between calculus and acalculous cholecystitis, the overall incidence of gallbladder perforation due to acalculous cholecystitis is higher, reaching approximately 10 to 20%[21,37]. There were 21 patients of calculus cholecystitis and 8 patients of acalculus cholecystitis in a study done by **Nandyala VNR et al. (2016)[22]**.

Of the 35 patients studied, 34 had underlying comorbid illnesses. Diabetes mellitus was seen in 18 (51.4%) patients followed by hypertension in 10 (28.6%) patients, 4 (11.4%) had COPD while as 1 (2.9%) each patient has CKD and hypothyroidism.

In this study, Type 2 GB perforation was seen in 30 (85.7%) patients, followed by Type 1 in 3 (86% patients while as 2 (5.7%) patients were found to have Type 3 FB perforation. **Patel G et al., (2019)[24]** studied 16 patients in which 11 patients were diagnosed with gallbladder perforation. Type 2 perforation was seen in majority of patients (n=7, 43.75) followed by type 1 in 5 (31.3%) patients and type 2 perforation was seen in 4 (25%) patients. **Tubachi P et al., (2018)[23]** conducted a study in which 7 patients had type I perforation, 3 patients had type II perforation and 1 had type one perforation. Percutaneous drainage of gall bladder was in 30 (85.7%) patients, 3 (8.6%) patients underwent emergency laparotomy with peritoneal lavage with cholecystostomy while as laparoscopic cholecystectomy with repair of fistula in 2 (5.7%) patients. **Bhattarai A et al (2021)[25]** conducted a retrospective review of the records of 24 patients who received medical and/or surgical treatment with the diagnosis of gall bladder perforation. In their study operative management was done in 12.5% (n=3) patients and percutaneous drainage of gallbladder was done in 87.5% (n=21).

Postoperative hospital stay in our study patients ranged between 5- 14 days with a median of 7 days. Duration of hospital stay in majority of patients i.e. 19 (54.3%) was 7-10 days, 12 (34.3%) patients needed <7 days hospitalization while as >10 days hospitalization was required by 4 (11.4%) patients. In a study done by **Bhattarai A et al (2021)[25]** median duration of hospital stay was 10 days. **Tubachi P et al., (2018)[23]** confirmed that the cases that were managed conservatively had hospital stay duration of less than ten days, whereas the ones that underwent operative intervention had hospital stay of more than ten days in their study. Complications were encountered in 8 patients including peritonitis in 3 (8.6%) patients, sepsis in 2 (5.7%) patients, cholecyto-entric fistula in 2 (5.7%) with pleural effusion in 1 (2.9%). **Nandyala VNR et al. (2016)[22]** conducted a study with complications including surgical site infection in 11 patients, respiratory tract infections in 7 patients and urinary tract infection in 3 patients.

Conclusion:-

Type II gallbladder perforation is the most common type. Contrast- enhanced CT has an important role in diagnosing gallbladder perforation. Early suspicion, diagnosis, and appropriate management are of crucial importance for a better outcome in patients with gall bladder perforation.

In conclusion, late operative intervention is associated with increased morbidity, mortality, number of ICU admissions, and long postoperative hospital stays. An early cholecystectomy strategy may lead to improved outcomes.

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