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RESEARCH ARTICLE

AN ANALYSIS OF BOWEL PERFORATION CASES AT A TERTIARY CARE CENTRE

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Abstract

Background: Acute abdomen is one of the most common causes of emergencies which present to surgeon and one the most common cause for it is Perforation peritonitis and timely management of it can prevent morbidity and mortality, its important to reach the diagnosis earliest and intervene immediately. Most of the time when patient presents to the tertiary centre, it is by clinical examination and investigation a diagnosis of perforation is established. The objective of the study was to evaluate causes, signs and symptoms, various modalities of management and possible complications which develop in gastrointestinal perforations.

Methods: This study comprises of 40 consecutive cases of acute perforation peritonitis on whom exploratory laparotomy was done. With study period of 18 months conducted by Department of General surgery, Basaveshwar Teaching and General Hospital, Kalaburgi. A complete detailed history, physical examination, relevant blood and radiological investigations were done. After that, patients were operated, preoperative findings were correlated with intra operative and radiological findings.

Results: Gastric perforation was the most common cause of perforation accounting for 37.5% of cases. Surgical site infection was common complication.

Conclusion: The standard of care for all perforations is surgery.

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Introduction:-

The most prevalent presenting complaint at the surgical emergency department is acute abdominal discomfort, which presents a significant diagnostic challenge to medical professionals. Seven to ten percent of all surgical emergency department visits are caused by acute abdominal discomfort¹.

An inflammatory process in the stomach, small and large intestines, and the pancreatic-biliary system are the most frequent causes of acute abdominal discomfort in the gastrointestinal system^{2,3}.

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The majority of individuals with acute abdomen present with a variety of symptoms, the most prevalent of which is abdominal discomfort. Depending on the underlying disease, additional symptoms like nausea, vomiting, fever, and constipation may also be observed⁴.

The mesothelial layer, the serosal surface, and the subserosal layer, which contains blood arteries and lymphatics, constitute the peritoneal cavity's lining under normal situations.

The reaction of closed peritoneal cavity cleanly divided into various stages is a sincere effort on the part of the body to maintain as close an internal milieu as possible and the stage of a neglected perforation is culmination of victory of fear over this hope.

Peritonitis is defined as inflammation of serosal membrane that lines the abdominal cavity and the organs contained in the abdominal cavity. Peritonitis has following stages :

1. Stage of chemical peritonitis-once perforation occur intestinal content escape into the peritoneal cavity leading to severe pain, vomiting tenderness guarding, rigidity, tachycardia, sweating.
2. Stage of reaction-peritoneum secretes lot of fluid to neutralize the escaped content and so temporarily the pain reduces, and the patient feels better.
3. Stage of diffuse bacterial peritonitis- after about six hours, bacteria from GIT migrate from the site of perforation causing diffuse peritonitis^{5,6}.

Peritonitis can be otherwise classified as a primary peritonitis due to haematogenous dissemination. secondary peritonitis due to perforation or trauma and tertiary peritonitis due to persistent or recurrent infection after adequate initial therapy.

Perforation can be diagnosed in most of the instances by its clinical presentation which include discomfort abdomen, vomiting, constipation, fever, guarding, rigidity, tenderness and distension of abdomen.

Diagnosis could be confirmed by doing erect X-ray of the abdomen taken which in most of the cases will show gas under right side of the diaphragm in few cases gas is not elicited that could be due to sealed perforation in such cases ultrasonography is advisable to look for pneumoperitoneum.

Exploratory laparotomy is only treatment that is mandatory in all the cases of perforation peritonitis though now a days endoscopic and laproscopic procedures are been tried but mainstay treatment is exploratory laparotomy.

Methods:-

It was a prospective interventional study. This study comprises of 40 consecutive cases of acute perforation peritonitis on whom exploratory laparotomy was done. With study period of 18 months conducted by Department of General surgery, Basaveshwar Teaching and General Hospital ,Kalaburgi. a complete detailed history, physical examination, relevant blood and radiological investigations were done. After that, patients were operated, preoperative findings were correlated with intra operative and radiological findings.

Inclusion criteria

All diagnosed cases of hollow viscus perforation on whom exploratory laparotomy was performed.

Exclusion criteria

All cases who were diagnosed having hollow viscus perforation but exploratory laparotomy could not be performed due to various reasons.

Results:-

On the basis of data obtained from 40 patients , 31 (77.5%) were male patients and 9(22.5%) were females which is depicted in figure 1.

To a greater extent incidence of perforative peritonitis was more in males due to excessive smoking and alcohol intake leading to peptic ulcer causing gastric and duodenal perforation. Most perforations were seen in males in age group of 21-40years (47.5%) which is depicted in figure 2.

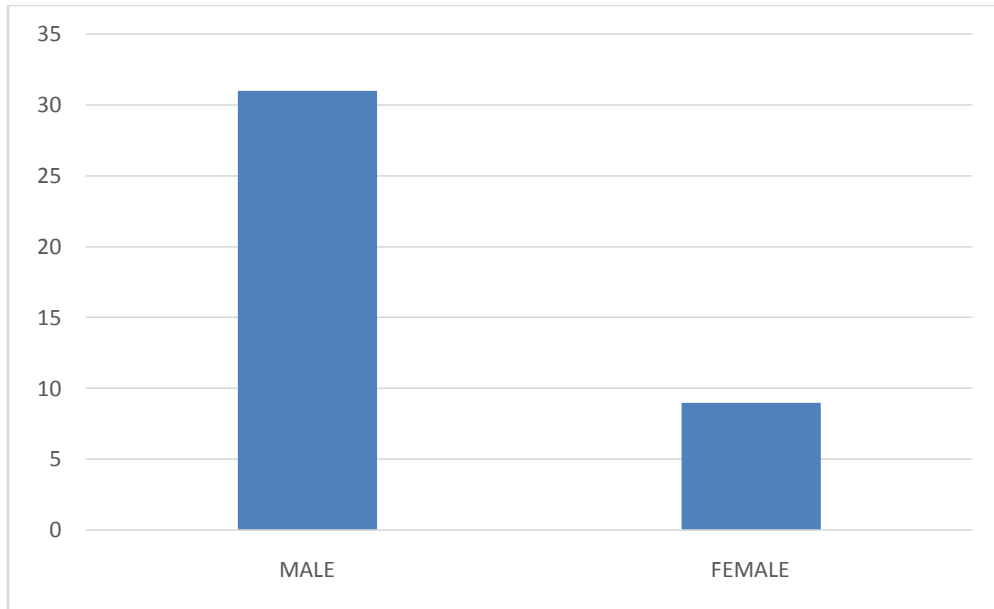


Figure 1:- Sex Distribution.

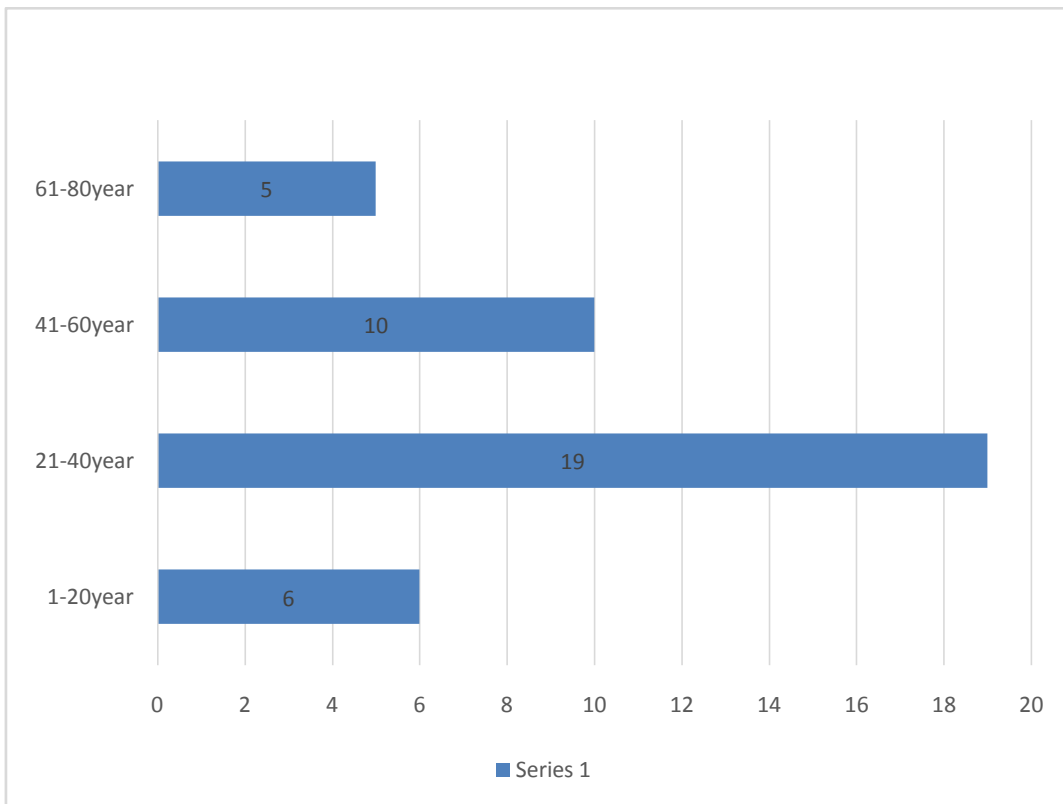


Figure 2:- Age Distribution.

Abdominal pain was seen in all the patients (100%).In this study it was seen that patients with duodenal and gastric perforation presented earlier (within 24 hours of onset of symptoms) than patients with distal bowel perforation indicating that pain in duodenal and gastric perforation was more severe. Patients presented with symptoms as shown in figure 3.

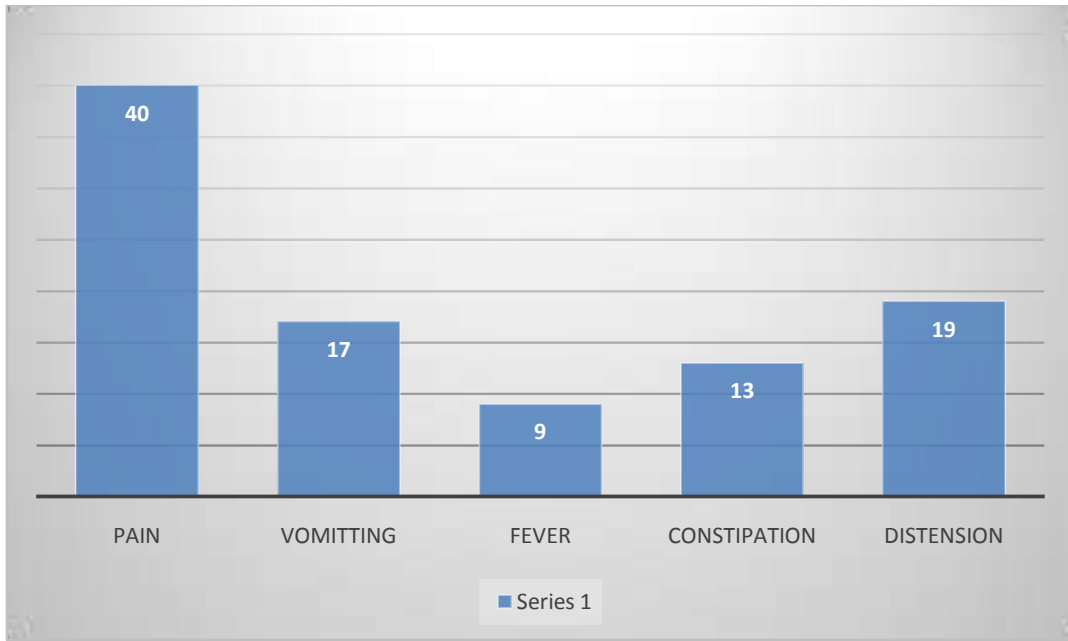


Figure 3:- Symptoms.

According to the data acquired from our study it was evident that most common site of perforation was gastric with 37.5%. second most common were duodenal and ileal perforation with 20% each. Other sites which are not common are jejunum and colon. Appendicular perforation was seen in 3 patients (Figure 4).

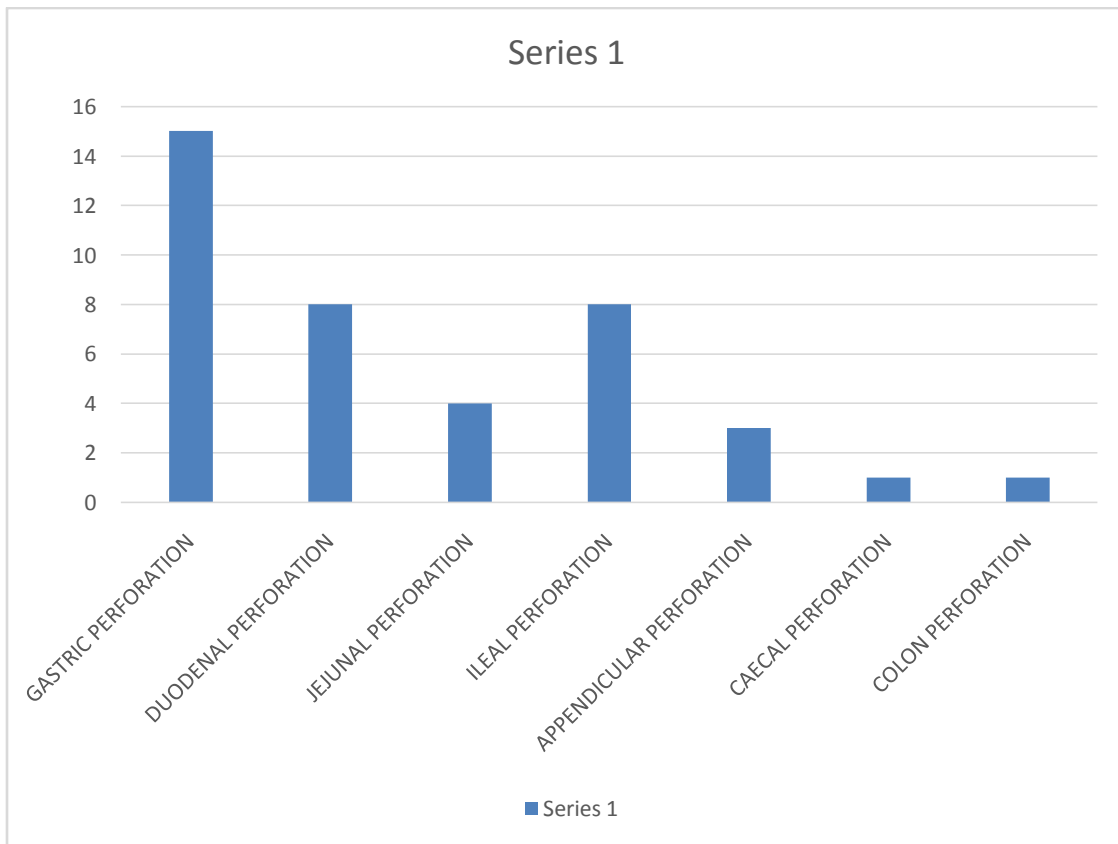


Figure 4:- Sites Of Perforation.

3 patients had traumatic perforation out of which 2 were due to blunt trauma injury and 1 due to penetrating injury , Rest 37 patients (92%) had non traumatic perforation.

On examination most of the patients were moderately built and nourished. 25 patients were dehydrated, and 5 patients were in shock. 25 patients had tachycardia pointing towards mild hypovolaemia. Tenderness was noted in all patients, with rigidity in 32 patients. Bowel sounds were absent in 30 patients and remaining patients it was Sluggish/absent.

On investigating 18 patients had haemoglobin >13%, could be due to haemoconcentration as most of them were dehydrated. In 22 cases haemoglobin was <10%. Total count was raised above 11,000 cells/mm³ in 37 cases with predominant neutrophilia, serum protein was <5 mg/dl in 20 patients, 9 patients were in pre-renal type of acute renal failure . Widal test was positive in 4 patients . Gas under diaphragm was seen in 39 patients. All the patients in this study demonstrated intraperitoneal free fluid with internal echoes in ultrasound. CECT abdomen was done in all patients of trauma to rule out other internal injuries.



Figure 5:- Erect Xray Abdomen Showing Gas Under Right Diaphragm.



Figure 6:- CT Image Showing Penetrating Foreign Body in Abdominal Cavity.

All patients were kept nil by mouth and intravenous fluids, antibiotics consisting of cefalosporins, aminoglycoside and anti-anaerobic drugs were administered. All patients were monitored for vital signs and abdominal girth. All patients were subjected to emergency exploratory laparotomy through midline incision under general anesthesia. Peritoneal fluid was sent for culture in all non-traumatic cases.

All patients with gastric perforations, it was closed primarily with omental patch. Duodenal perforations were closed by Roscoe Graham method by using omental patch, out of which one patient had perforation due to blunt trauma who developed leak on 5th postoperative day for which the patient went re-exploration during which feeding jejunostomy was done and patient was discharged on 13th post operative day. In jejunal and ileal perforations all were closed primarily in a plane perpendicular to lumen & perforation axis, 2 patients underwent resection and anastomosis due to multiple perforations. 1 had transverse colonic perforation due to penetrating injury for which resection anastomosis was done. Vicryl suture was used for perforation closure in all cases. Edge biopsy from perforation was taken in all cases and sent for histopathological examination to confirm the cause which is illustrated in table 1 except traumatic cases.

ETIOLOGY	NUMBER OF CASES
Acid peptic disease	27
Typhoid	4
Tuberculosis	2
Trauma	3
Malignancy	4

Table 1:- Etiology Of Hollow Viscus Perforation.

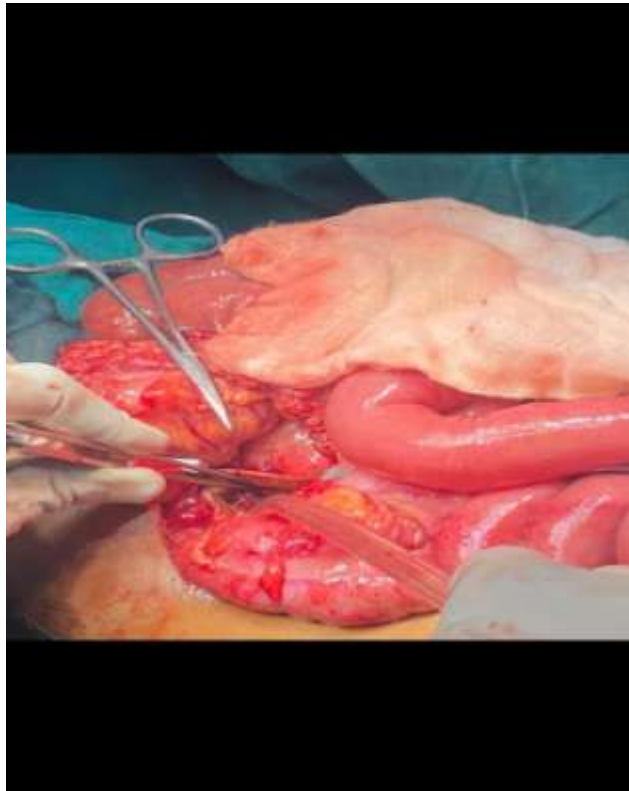


Figure 7:- Intraoperative Image Of Duodenal Perforation.

Post-operatively patients were managed as per requirement. Post-op complications are described in Table 4.

COMPLICATION	NUMBER OF CASES
Surgical site infection	19
Enterocutaneous fistula	3
Septic shock	5

Respiratory tract infection	2
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Table 4:- Complications.

For all surgical site infection cases culture sensitivity was done and treated accordingly and 3 cases required secondary suturing. In 3 cases of enteric fistula 1 patient of duodenal perforation was reexplored and feeding jejunostomy was done. other 2 cases of enteric fistula was managed conservatively with antibiotics and total parenteral nutrition and they recovered.

**Figure 8:-** Surgical Site Infection.**Discussion:-**

Our study attempted to detail out various factors behind gastrointestinal perforation from a tertiary setting. Secondary peritonitis caused by perforation of hollow viscus is common in emergency department of any hospital. It is seen in our study that perforative peritonitis most commonly affects young men in the prime of their life I.e, between 20-40years as compared to western studies where mean age is between 45-60 years^{7,8}. Males to female ratio clearly defines in our study that it is more prevalent in males probably due to alcohol intake, smoking and other drug abuse that leads to peptic ulcers which is prone for perforation.

Proximal gastrointestinal perforations were more common in our study, mainly gastric perforation followed by duodenal and ileal perforation . Our study showed acid peptic disease as common cause of perforation . In this study most of the patients had history of intake of non-steroidal anti-inflammatory drugs (NSAIDs) which could be the cause of perforation in some patients mainly labourers who were taking analgesics. similar relation was depicted in study conducted by LaGarcía Rodríguez et al.⁹

During a focused abdominal examination, diffuse air and intestinal leakage may make it difficult to localise the pain, but probing is likely to reveal sensitivity. Often, patients experience nausea and vomiting. Peritoneal signs like rigidity and guarding may manifest as things go on. Vital signs may be normal, especially in early presentation; however, tachycardia, tachypnea, fever, and other signs of sepsis are likely to develop¹⁰.

Clinical examination , and erect X-ray abdomen is sufficient in most of the cases to diagnose perforation peritonitis while in few cases help of ultrasonography and CT scan was necessary.

Surgical consultation should be pursued early in any patient with abdominal pain and signs of clinical deterioration¹¹.

Major post-operative complication in our study was Surgical Site Infections (47%) which is more than Parimala Devi et al where SSI was 25%. Even appropriately managed, bowel perforation can lead to increased morbidity and mortality from post-repair complications such as adhesions and fistula formation¹².

Mortality rate in our study was only 5%, can be due to small sample size, whereas mortality rate in other Indian studies were 14% and 8%. Due to small sample size of our study it was not possible to find the common cause of mortality in gastro intestinal perforations.

Conclusion:-

Contrary to the West, where distal GI perforations are widespread, gastroduodenal perforations are more prevalent in developing nations like India. Acid peptic disease and infections like typhoid are common cause of perforation in India unlike west where traumatic perforations are more common. This study also reveals that co-morbid conditions and delayed presentation and treatment will both increase the likelihood of complications.

Early identification, fluid and electrolyte resuscitation, timely surgical intervention, antibiotic therapy, and eradication of the infection's cause are crucial variables in determining the patient's prognosis for perforation peritonitis.

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