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A Retrospective Analysis on Etiopathogenesis and Clinical Outcomes of Atraumatic Perforation Admitted Over a Period of 3 Years

Dr. Raviraj Jadhav*, Dr. Gayatri Tahiliani, Dr. Ali Reza Shojai***, Dr. Ashok Kalyanshetti******

*Associate Professor, Dept of General Surgery, MGM Institute of Health Sciences, Navi Mumbai, India
**Final Year Resident, Dept of General Surgery, MGM Institute of Health Sciences, Navi Mumbai, India
***Professor and Head of Unit, Dept of General Surgery, MGM Institute of Health Sciences, Navi Mumbai, India
**** Professor and Head of Department,
Dept of General Surgery, MGM Institute of Health Sciences, Navi Mumbai, India

Abstract: ***Introduction: Gastro intestinal perforation is the most common surgical emergency presenting as an acute abdomen. Diagnosing a gastrointesinal perforation is not a herculean task except cases complicated with a small sealed perforation and overlapped with a picture of ileus or obstruction. The current paper states the changes with time with regards to its etiology from gastric to duodenal and in management from colostomies to primary closure. We present a case study of 100 patients to know most common cause of gastro intestinal perforation, their symptomology and recent techniques of management with management of their complications studied from May2004-Aug 2006. Method: The study includes 100 patients admitted in a major tertiary institution in rural India between 2004 and 2006 and studied with respect to incidence, modes of clinical presentation, management and outcome. Results: Maximum patients reported were between 21 to 30 years of age. Males are predominantly affected. The study concludes that peptic ulcer disease (duodenal) is still the most commonest cause of Gi perforations. All patients present with acute abdominal pain and vomiting as the second symptom. The presentation is delayed most patients presenting within 24 hours after onset of symptoms. The most common mode of diagnosis remains the erect abdominal X-ray and the time of presentation relates with the patients time of recovery. Most common surgery used is still primary repair /closure followed by resection anastomosis and with a noted decline in the number of colostomies operated***

Keywords: Gastrointestinal Perforation, Surgery, Emergency, Acute Abdomen

1. Introduction

Gastro intestinal perforation is the most common surgical emergency presenting as an acute abdomen. It refers to the clinical condition in which an acute change in the condition of intra abdominal organ which is usually associated with inflammation and infection, demands immediate and accurate diagnosis and management.(1)

Data suggests duodenal ulcer is the most common etiology worldwide and nationally, incidence being higher in adults than in children.

Pathogenesis of acute perforation begins from its etiology progressing to perforative peritonitis, Multiple organ dysfunction syndrome (MODS) and death being the endpoint without timely management.

Diagnosing a gastrointesinal perforation is not a herculean task except cases complicated with a small sealed perforation and overlapped with a picture of ileus or obstruction.

The current paper states the changes with time with regards to its etiology from gastric to duodenal and in management from colostomies to primary closure.

In retrospect there has been a decline in mortality over the years which may be attributed to early admission to the hospital, improved modalities of investigations, better pre operative resuscitation, early intervention and improved surgical instruments and techniques with minute critical care monitoring.

We present a case study of 100 patients to know most common cause of gastro intestinal perforation, their symptomology and recent techniques of management with management of their complications studied from 2004 to 2006.

2. Aims and Objectives

Following parameters and their co relations were studied
Incidence of Gi perforations and their etiology
Age related incidence of perforations
Sex related incidence of perforations
Etiology related to size of perforations
Incidence of symptoms
Incidence of signs
Correlation between time lag of onset of symptoms and management and recovery
For e.g. time period of starting bowel movements
Time period of passage of stools

3. Materials and Method

This study comprises a cross sectional study of 100 Gi perforations with various etiologies Cases admitted in MGM

medical college Navi Mumbai conducted between May2004 to August 2006

The patients with sudden onset of pain in abdomen, vomiting, fever were examined. On examination those with tenderness guarding rigidity distension were evaluated. Those with history of abdominal trauma were also included in the study. Besides routine blood investigation specific investigations for diagnosis like erect Xray abdomen and four quadrant tap and ultrasonography was done. After establishing most probable diagnosis patients were subjected to laparotomy. Nature and cause of perforation were noted along with procedure done and post operative complications noted

Inclusion Criteria

- Patients presenting with acute abdomen
- Patients with history of blunt trauma and found to have perforation on laparotomy also included

Exclusion Criteria

Neonates
Esophageal injuries

Age Group(in Years)	No of cases/100
1-20	2
13-20	9
21-40	61
41-60	20
>60	8

2)Sex related incidence:	
Sex	No of cases
Male	90
Female	10

3)Incidence of the symptoms:								
Chief complaints	Pain P/A	Vomiting	Obstipation	Loose motions	Distension	Fever	Hematemesis	Malena
Present	100	56	24	2	18	38	1	1
Absent	0	44	76	98	82	62	99	99

4)Incidence of signs:						
Signs	Guarding	Tenderness	Rigidity	Rebound tenderness	Dullness on percussion	Bowel sounds
Present	92	97	78	75	67	44
Absent	8	3	22	25	33	56

5)Time lag between s/o and treatment:	
Time lag	No of cases
<6hrs	33
6-12hrs	33
12-24hrs	28
24-48hrs	3
>48hrs	3

6)Investigations:	
WBC counts:	
WBS count	No. of cases
<10000	62
10000-20000	33
>20000	5

Investigations(widal test,HIV,gas under diaphragm on x ray abdomen):			
	Widal test	HIV	Gas under diaphragm on x ray film
+ve	5	5	79
-ve	33	95	21

Incidence of site of the perofration:	
Site of the perforation	No of cases
Gastric	17
Duodenal	38
Jejunal	10
Ilel	14
Appendicular	16
Colonic	1
G and D	1
I and J	1

Incidence of the Etiology of perforation:		
	Cause of perforation	No of cases
1	Peptic	56
2	Typhoid	11
3	Appendicular	16
4	Traumatic	10
5	Tuberculosis	3
6	Meckel's diverticulitis	1
7	Colonic diverticulitis	1
8	Carcinoma of stomach	1
9	Obstructed hernia	1

Etilogy related incidence of the site of the perforation:									
Observations:									
Cause of perf.	Site of perf.	Gastric	Duodenal	Jejunal	Ileal	Appendicular	Colonic	G&D	J& i
1.Peptic		17	38	0	0	0	0	1	0
2.Typhoid		0	0	1	10	0	0	0	0
3.Appendicular		0	0	0	0	16	0	0	0
4.Traumatic		0	0	8	1	0	0	0	1
5.tuberculosis		0	0	1	2	0	0	0	0

Etilogy related incidence of the site of perforation(in %):									
Cause of perf.	Site of perf.	Gastric	duodenal	Jejunal	Ileal	Appendicular	Colonic	G&D	J&I
1.peptic		30.36	67.86	0	0	0	0	1.78	0
2.Typhoid		0	0	9.09	90.91	0	0	0	0
3.Appendicular		0	0	0	0	100	0	0	0
5.Traumatic		0	0	80	10	0	0	0	10
6.Tuberculosis		0	0	33.33	66.66	0	0	0	0

4. Interpretation of Results

Out of 100 cases studied commonest site was duodenal commonest site of traumatic perforation was jejunal commonest causes was typhoid ulcer and tubercular ulcer perforations. Both showed perforations in the ileum and jejunum.

5. Discussion

Previous studies showed peptic ulcer and acid peptic disease as the most common cause in 1967 followed by typhoid ulcer perforation. Ongoing trend in increase in use of PPI showed similar incidence of duodenal ulcers - ie Acid Peptic disease but with a significant decline in incidence.

1)Etiology related incidence:			
Etilogy	Bhansali[2,3](1967) 96 cases	Dandapat et al [4](1991) 340 cases	Present study (2004-2006)100 cases
	N(%)	N (%)	N=%
Peptic	48(50)	276(81.15)	56
Typhoid	29(30.2)	25(7.3)	11
Tuberulosis	07(7.3)	24(7.1)	3
Traumatic	06(6.25)	07(2.2)	10
Others	06(6.25)	08(2.25)	20

2.Age related incidence:		
Age group	Dandapat [4]et al (1991)340 cases	Present study (2005-2006) 100 cases
	N(%)	N=%
<20	50(14.71)	11
20-40	208(61.15)	61
>40	82(24.12)	28

Incidence in previous and current study concluded that an age from 20-40 yes has the highest incidence of traumatic and a traumatic Gi perforations

Sex related incidence

3.Sex related incidence:				
Author	Year	Males	Females	Ratio(M:F)
Ilingworth[5]	1924-1933	3450	186	19:01
Jamieson[6]	1934-1943	5046	276	18:01
Jameison[6]	1944-1953	5854	439	12:01
Mackey	1954-1963	4563	780	6:01
and in India				
Author	Year	Males	Females	Ratio(M:F)
Dandapat et al[4]	1991	304	36	8.4:1
Present study	2004-2006	90	10	9:01

5)Etiology and the site of the perforation:			
Ratio	Illingworth et al[5]	Jameison et al[6]	Present study
	-1925	-1943	(2004-06)
D:Gperf	3:01	8:01	2.23:1

As in other studies ratio of perforations is always higher in males

6)Incidence of the symptoms:		
s/o	Dickson and Cole[9] (1968) 38 cases	Present study(2004-04) 100 cases
	N(%)	N=%
Abdominal pain	38(100)	100
Vomiting	24(63.16)	56
Obstipation	20(52.63)	24
Distension	20(52.63)	18
Diarrhoea	14(36.84)	2
Fever	24(63.16)	38

Duodenal perforations are always higher in incidence as compared to go perforations as in other studies

The above table compares other studies with symptomology and it shows abdominal pain is the most constant symptom. Other symptom varies with etiology, site and time lag between onset and presentation

7)Incidence of the signs:		
Signs	Archampong et al[10](1968) 121cases	Present study(2004-06) 100 cases
	N(%)	N=%
Guarding	96(79)	92
Tenderness	121(100)	97
Rigidity	30(24)	78
Rebound tenderness	94(70)	75
Free fluid	14(11.60)	65
Absent bowel sounds	101(83.5)	56

To compare signs elicited by the surgeon tenderness and guarding along with absent bowel sounds were the most important ones in cases of gastrointestinal perforations

6. Etiology of Various Sites of Perforation

Gastrointestinal perforations may have vast majority of the etiological factors as follows:

1. Traumatic Perforations

a) Blunt injuries: Solid organs are more likely to be compressed from the blunt trauma than are the hollow viscera. Thus the kidneys, liver, spleen and pancreas are especially vulnerable, while intestines and stomach are less likely to do so. Among which more commonly affected are small intestines especially upper jejunum.
b) Penetrating injuries: These injuries involve the viscera approximately in proportion to the volume of the space each of them occupies. Thus, there is great increase in frequency of wounds of the small intestines and the large one.

2. Pathological perforations

A) Stomach and duodenum

a) Peptic ulcer: Perforation may occur in acute or chronic cases. It is the commonest cause of the GI perforations. More common in the duodenum than in stomach.
b) Carcinoma of the stomach: Perforation may be the first manifestation of carcinoma. Biopsy from edge of the perf. Confirms the diagnosis

B) Small intestines:

a) Typhoid ulcers: It is the commonest cause of the perforation in the small intestines. Ulcer is usually single and along the parallel to the long axis of the gut. It is common in lower 1/3rd of the ileum.
b) Tuberculous ulcers: The multiple ulcers in the terminal ileum characterize it. The long axis of the ulcer lye transversely.
c) Meckel's diverticulum: may perforate due to lodging of the coarse food residue or a sharp foreign body or acid secreting mucosa.
d) Ascaris Lumbricoides: it may cause primary or secondary perforations.
e) Inflammatory bowel diseases: Crohn's disease or ulcerative colitis. More commonly it is Crohn's Disease.
f) Non – specific ulcers (Kocher's ulcers): t is of uncommon etiology.
g) Appendicitis: it my perforate to form frank peritonitis of appendicular abscess if proper care is not taken by using Oshner Sherrn regime.
h) Miscellaneous: - Amoebic dysentery
   - Bacillary dysentery
   - Scleroderma
   - Reduplicated ileal loop syndrome, etc.

i) Large intestines: a) Carcinoma: may present as perforation
j) IBD: More commonly it is ulcerative colitis.
k) Amoebic ulcers: the most common sites are caecum and rectosigmoid junction. If perforation occurs then it is commonly in the confined space causing abscess. Frank peritonitis is very rare.

l) Diverticulitis: Diverticulitis may perforate if proper antibiotics and NSAID is not advised.

Peptic ulcer perforation

This complication has become much more common since last 20-25Years. In a series of 33459 cases of gastroduodenal ulcer as per study by Debakey, there are 4410 cases of the perforations an incidence of 13.3 %. Berger found that it is 18.1 % in his studies and P.K. Sen et al (1964) reports 28.8

5 incidence of the perforation which is maintained at steady level. Most of the statistics however are based on the proportion of the peptic. Ulcer that has been perforated in the patients visiting and / or admitted in the Hospital for the treatment. If taken into the account the large number of the Patients that had been treated outside the hospital this percentage of perforation. Would have been lower than documented. Nevertheless perforation is still a common cause of the death and this must be seriously considered when advising. A patient whether or not has elective surgical procedure done for his treatment.

7. Conclusions

The study concludes that peptic ulcer disease (duodenal) is still the most commonest cause of Gi perforations. Even though incidence has decreased, peak age between 20-40 yrs of age, males being more vulnerable.

All patients present with acute abdominal pain and vomiting as the second symptom. The presentation is delayed most patients presenting within 24 hours after onset of symptoms. The most common mode of diagnosis remains the erect abdominal Xray and the time of presentation relates with the patients time of recovery.

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