

Clinical Study and Management of Non Traumatic Hollow Viscus Perforation

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Abstract

Background: Acute abdomen constitutes about 5-10% of all emergency department visits. Gastrointestinal perforations account for about 25% of acute abdominal emergencies. Non-traumatic gastrointestinal perforations have received very less attention in the recent medical literature than inflammations, tumors or traumatic lesions of solid abdominal organs. Improved medical and surgical care has reduced the problem in North America and the U.K., where vascular lesions and malignancies are predominant cause of perforations, while in India, peptic ulcer disease, typhoid and tuberculosis are still preceding malignancies.

Aim: To evaluate the clinical profile of patients with non traumatic hollow viscus perforation and its management.

Objectives: To assess the clinical features of non traumatic hollow viscus perforation, find out the different sites of non traumatic hollow viscus perforation and their possible etiologies and to assess the different operative procedures and their outcome.

Methodology: This was a hospital based observational study. All Patients clinically diagnosed as non traumatic hollow viscus perforation with radiological proof by abdominal erect Xray showing free gas under diaphragm and or per operative confirmation in the department of Surgery, fulfilling the inclusion and exclusion criteria and giving an informed written consent within the period of study from June 2019 to May 2018. Such 63 cases could be studied. Non traumatic hollow viscus perforation with regards to age, sex, clinical features, diagnostic modalities, etiology, site of perforation, operative procedures and post operative complications were evaluated and studied.

Results: Out of 63 cases, most common age group of presentation was 30-39 years, mean age of presentation being 35.94 ± 15.94 years. The male:female ratio being 5.3:1. Pain abdomen was the most common presenting symptom 100% cases, followed by distention of abdomen in 76.19% cases. Guarding/Rigidity was the most common sign in 88.89% cases, obliterated liver dullness in 73.02% cases. In abdominal erect Xray Gas under diaphragm was seen in 73.02% cases. Duodenum was the most common site of non traumatic hollow viscus perforation in 65.08% cases, followed by appendix in 20.63% cases, ileum in 7.94% cases, gastric antrum in 4.76% cases and jejunum in 1.59%. The most common etiology of non traumatic hollow viscus perforation was Peptic Ulcer Disease in 69.84% cases. The most common surgical procedure performed was Modified Graham Patch Repair in 65.08% cases. Wound infection was the most common post operative complication.

Conclusion: Non Traumatic Hollow Viscus Perforation remains to be one of the most common causes of acute abdomen and the most common surgical emergency. It is most commonly seen in young and middle aged people where males are more affected than females. Delay in presentation, decrease immunity and poor general condition of patients add to postoperative morbidity.

Key words: Abdomen, Clinical study, Non traumatic hollow viscus perforation.

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I. Introduction

Acute abdomen constitutes about 5-10% of all emergency department visits.¹ Gastrointestinal perforations account for about 25% of acute abdominal emergencies.² Perforation of any part of gastrointestinal track usually gives rise to a life threatening emergency. A high index of suspicion is necessary to diagnose visceral perforation early.³ India is a developing country and there has been a considerable change in management of infectious disease leading to decline in the complications; despite which hollow viscus perforations remain to be one of the most common surgical emergencies.⁴ Non-traumatic gastrointestinal perforations have received very less attention in the recent medical literature than inflammations, tumors or traumatic lesions of solid abdominal organs. The first clinical description of perforated ulcer was made by Crisp in 1843.⁵ The most common cause of hollow viscus perforation is gastroduodenal peptic ulcer disease. The incidence of perforation has been reported to be 2% to 5% in patients with peptic ulcer disease.⁶ Success in

treatment depends mainly on early diagnosis with early intervention and competent post operative care. Sir Henle's aphorism is that 'In acute abdominal emergencies, the difference between the best and worst surgery is infinitely less, than between early and late surgery and greatest sacrifice is sacrifice of time.'⁷

AIMS

- ➲ To evaluate the clinical profile of patients with non traumatic hollow viscus perforation and its management.

OBJECTIVES

- ➲ To assess the clinical features of non traumatic hollow viscus perforation.
- ➲ To find out the different sites of non traumatic hollow viscus perforation and their possible etiologies.
- ➲ To assess the different operative procedures and their outcome.

II. Methodology

This was a hospital based observational study. All Patients clinically diagnosed as non traumatic hollow viscus perforation with radiological proof by abdominal erect Xray showing free gas under diaphragm and or per operative confirmation in the department of Surgery, fulfilling the inclusion and exclusion criteria and giving an informed written consent within the period of study from June 2019 to May 2018. Such 63 cases could be studied.

Inclusion criteria

All Patients above 12 years age clinically diagnosed as non traumatic hollow viscus perforation with radiological proof by abdominal erect Xray showing free gas under diaphragm and or per operative confirmation giving informed written consent for the study in the department of Surgery, Assam Medical College and Hospital.

Exclusion Criteria

- i) Patients not giving consent for the study.
- ii) Patients with traumatic hollow viscus perforations diagnosed clinically and radiologically.
- iii) Patients with sealed with hollow viscus perforation treated conservatively.
- iv) Patients below 12 years age.

Statistical Ananysis The data collected was tabulated on Microsoft Excel. The categorical variables were summarized as proportions and percentages and continuous data was presented as Mean \pm SD. Daigramatic presentations were also made wherever suitable.

III. Results And Observations

The study was hospital based observational study conducted on patients with non traumatic hollow viscus perforation admitted in different units of the Department of General surgery, Assam Medical College & Hospital, Dibrugarh during the period of study. The study period was from June 2019 to May 2020. A total of 63 cases were selected. The result and observation have been recorded in the following tables and figures.

The youngest patient in our study was **14** years old and the oldest was **70** years old. Peak age of incidence was between **30-39** years and mean age was **35.94 \pm 15.94** years. There were **53** males (**84.13%**) and **10** females (**15.87%**) cases out of 63 cases. The male:female ratio being **5.3:1.26.98%** belonged to upper middle class, **34.92%** belonged to lower middle class, **23.81%** belonged to upper lower class and **14.29%** belonged to lower class. Among risk factors associated with non traumatic hollow viscus perforation **22.22%** cases had history of smoking, alcohol in **15.87%** cases and history of NSAIDS consumption in **12.70%** cases. The minimum presentation of duration of perforation was at **16** hours and the maximum duration was **116** hours. Peak incidence was between **48-72** hours and mean duration was **65.05 \pm 14.56** hours. Pain abdomen was the most common presenting symptom **100%** cases, followed by distention of abdomen in **76.19%** cases, constipation/diarhoea in **58.73%** cases, vomiting in **53.97%** cases, fever in **42.86%** cases, shock in **4.76%** cases. Guarding/Rigidity was the most common sign in **88.89%** cases, obliterated liver dullness in **73.02%** cases, inaudible bowel sounds in **66.67%** cases. In abdominal erect Xray Gas under diaphragm was seen in **73.02%** cases. Ultrasonography Whole abdomen showing free fluid in peritoneal cavity was seen in **80.95%** cases. Raised total leucocyte count was seen in **66.67%** cases, raised serum creatinine in **20.63%** cases, hypokalemia in **9.52%** cases, hyponatremia in **14.29%** cases. Duodenum was the most common site of non traumatic hollow viscus perforation in **65.08%** cases, followed by appendix in **20.63%** cases, ileum in **7.94%** cases, gastric antrum in **4.76%** cases and jejunum in **1.59%**. The most common etiology of non traumatic

hollow viscus perforation was Peptic Ulcer Disease in **69.84%** cases, followed by Acute Appendicitis in **20.63%** cases, Abdominal Tuberculosis in **7.94%** cases and Typhoid fever in **1.59%**. The peak duration of surgery was between **1.5-2** hours in **61.90%** cases with mean duration being **2.02±0.37** hours. The most common surgical procedure performed was Modified Graham Patch Repair in **65.08%** cases, followed by Appendectomy in **20.63%** cases, Laparoscopic Modified Graham Patch Repair was done in **4.76%** cases, Resection and Anastomosis with ileostomy done in **3.17%** cases, Primary repair in **3.17%** cases, Ileostomy in **1.59%** cases and jejunostomy in **1.59%** cases. The most common postoperative complication was Wound infection in **33.33%** cases, followed by Respiratory infection in **26.98%** cases, Dyselectrolytemia in **19.05%** cases and sepsis in **17.46%** cases. The minimum duration of hospital stay was **6** days and maximum was **23** days, most common duration of hospital stay was between **8-14** days and mean duration was **11.75±4.13** days. The morbidity rate in this study was **53.97%** and mortality rate was **4.76%**.

**TABLE 1
AGE WISE DISTRIBUTION**

AGE GROUP (in years)	NUMBER	PERCENTAGE
12—20	12	19.05
20—29	10	15.87
30—39	17	26.98
40—49	14	22.22
50—59	5	7.94
>/=60	5	7.94
TOTAL	63	100.00
Mean ± S.D.	<i>35.94 ± 15.44 years</i>	

**TABLE-2
GENDER WISE DISTRIBUTION**

GENDER	NUMBER	PERCENTAGE	RATIO (Male: Female)
Male	53	84.13	5.3 : 1
Female	10	15.87	
TOTAL	63	100.00	

**TABLE-3
SOCIOECONOMIC STATUS**

SOCIOECONOMIC CLASS		NUMBER	PERCENTAGE
I	Upper Class	0	0.00
II	Upper Middle Class	17	26.98
III	Lower Middle Class	22	34.92
IV	Upper Lower Class	15	23.81
V	Lower Class	9	14.29

TOTAL	63	100.00
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**TABLE-4
RISK FACTOR FOR PERFORATION**

RISK FACTOR	NUMBER (n=63)	PERCENTAGE
Smoking	18	22.22
Alcohol	10	15.87
NSAID's	8	12.70

**TABLE-5
DURATION OF PERFORATION**

DURATION (in hours)	NUMBER	PERCENTAGE
<24	1	1.57
24–48	2	3.17
48–72	52	82.54
>72	8	12.70
TOTAL	63	100.00
<i>Mean ± S.D.</i>	<i>65.05±14.56hours</i>	

Table 6 CLINICAL FEATURES

CLINICAL FEATURES	NUMBER (n = 63)	PERCENTAGE
Pain	63	100.00
Guarding/Rigidity	56	88.89
Distension of Abdomen	48	76.19
Obliterated Liver Dullness	46	73.02
Inaudible Bowel Sound	42	66.67
Constipation/Diarrhoea	37	58.73
Vomiting	34	53.97
Fever	27	42.86
Shock	3	4.76

**TABLE-7
ERECT X-RAY ABDOMEN (GAS UNDER DIAPHRAGM)**

GAS UNDER DIAPHRAGM	NUMBER	PERCENTAGE
Present	46	73.02
Absent	17	26.98
TOTAL	63	100.00

**TABLE-8
USG ABDOMEN SHOWING FREE FLUID**

FREE FLUID	NUMBER	PERCENTAGE
Present	51	80.95
Absent	12	19.05
TOTAL	63	100.00

**TABLE-9
LABORATORY FINDINGS**

FINDINGS	NUMBER (n = 63)	PERCENTAGE
Raised TLC (>11000 cells/cumm)	42	66.67
Raised Serum Creatinine (>1.5mg/dl)	13	20.63
Hypokalemia (S.K+ <3.5 meq/l)	6	9.52
Hyponatremia (SNa+<135 meq/L)	9	14.29

**TABLE-10
DISTRIBUTION AMONG SITE OF PERFORATION**

SITE OF PERFORATION	NUMBER	PERCENTAGE
Duodenum	41	65.08
Gastric Antrum	3	4.76
Jejunum	1	1.59
Ileum	5	7.94
Appendix	13	20.63
TOTAL	63	100.00

**TABLE-11
DISTRIBUTION AMONG ETIOLOGY OF PERFORATION**

ETIOLOGY	NUMBER (n = 63)	PERCENTAGE
Peptic Ulcer Disease	44	69.84
Acute Appendicitis	13	20.63
Abdominal Tuberculosis	4	6.35
Typhoid	1	1.59

**TABLE-12
SURGICAL PROCEDURE ADOPTED**

SURGICAL PROCEDURE	NUMBER	PERCENTAGE
Modified Graham Patch Procedure Repair	41	65.08
Appendicectomy	13	20.63
Laparoscopic Modified Graham Patch Repair	3	4.76
Primary Repair	2	3.17
Resection and Anastomosis+ Ileostomy	2	3.17
Ileostomy	1	1.59
Jejunostomy	1	1.59
TOTAL	63	100.00

**TABLE-13
DURATION OF SURGERY**

DURATION (in hours)	NUMBER	PERCENTAGE
1.0—1.5	11	17.46
1.5—2.0	39	61.90
2.0—2.5	10	15.87
>2.5	3	4.76
TOTAL	63	100.00
<i>Mean ± S.D.</i>	<i>2.02 ± 0.37 hours</i>	

**TABLE-14
POST OPERATIVE COMPLICATIONS**

POST OPERATIVE COMPLICATIONS	NUMBER (n = 63)	PERCENTAGE
Wound Infection	21	33.33
Respiratory Infection	17	26.98
Sepsis	11	17.46
Dyselectrolytemia	12	19.05

**TABLE-15
HOSPITAL STAY**

HOSPITAL STAY (in days)	NUMBER	PERCENTAGE
1—7	0	0.00
8—14	51	80.95
15—21	9	14.29
>21	3	4.76
TOTAL	63	100.00
<i>Mean ± S.D.</i>	11.75 ± 4.13 days	

**TABLE-16
OUTCOME FOLLOWING SURGERY**

OUTCOME FOLLOWING SURGERY	NUMBER	PERCENTAGE
Normal Recovery	26	41.27
Recovery with Complication	34	53.97
Death	3	4.76
TOTAL	63	100.00

Figure-1 Perforation in the 1st Part of Duodenum.

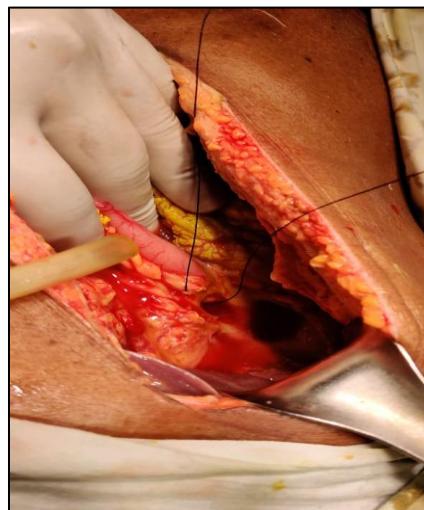


Figure-2Modified Graham Patch Repair done for Duodenal Ulcer Perforation.



Figure 3Ileal Perforation.



Figure-4Antral perforation.



Figure-5Jejunal Perforation.



IV. Discussion

In our study we found that the youngest patient was of 14 years and the oldest patient was 70 years old. The peak incidence was noted in the 30-39 years age group. The mean age was being 35.94 ± 15.44 years. There were 53 males (84.13%) and 10 females (15.87%). The male to female ratio was 5.3:1. **Anjaneya T et al** in 2019⁸ of 50 patients studied that most common age group affected was 30 to 39 years and male (82%) than female- 9 cases (18%). 17 cases(26.98%) belonged to upper middle class, 22 cases(34.92%) belonged to lower middle class, 15 cases(23.81%) belonged to upper lower class and 9 cases (14.29%) belonged to lower class. **Biram Chand Mewara et al(2017)**⁹ found that most of patients belong to the low socio-economic class (67%) while its incidence in the effluent class was very low (3%). Smoking was found in 22.22% cases, alcohol consumption in 15.87% cases and history of NSAID intake in 12.70% cases. **Neeraj Kumar Jain et al** in 2017¹⁰ found smoking in 20% cases, history of medications in 9.09% cases and alcohol consumption in 5.45% cases. Minimum duration of perforation presented was 16 hours and maximum was 116 hours and most commonly presented between 48-72 hours after perforation and mean duration was 65.05 ± 14.56 hours. **Anjaneya T et al(2019)**⁸ found that the maximum duration of perforation was 5 days and minimum duration was 1 day with mean duration of perforation being 3days. Pain abdomen was the most common presenting symptom in all the 63 cases (100%), distention of abdomen in 48 cases (76.19%), constipation/diarrhea in 37 cases(58.73%), vomiting in 34 cases (53.97%), fever in 27 cases (42.86%), shock in 3 cases (4.76%), guarding/rigidity found in 56 cases (88.89%), followed by obliterated liver dullness in 46 cases (73.02%), then inaudible bowel sounds in 42 cases(66.67%). **Anjaneya T et al(2019)**⁸ found pain abdomen(100%) cases was a universal symptom, abdominal distension was seen in 80% cases, vomiting in 50% cases, raised temperature in 56% cases and shock in 4% cases. **Neeraj Kumar Jain et al** in 2017¹⁰ found that guarding/rigidity was seen in 90% cases, obliterated liver dullness in 63.63% cases and absent bowel sounds in 69.1% cases. **Velappan DP et al.** (2017)¹¹ found that guarding was present in 100% cases, obliterated liver dullness in 68% cases and absent bowel sounds in 70% cases. 43 cases(73.02%) had air under diaphragm in erect X-ray abdomen. Pneumo-peritoneum in chest X-ray of the patients studied was in (74.5%) patients of perforation in 2015 studied by **Atif Abdullah Cet et al**¹². In 2017 **Varun Raju Thirumalagiri et al**¹³ studied that gas under diaphragm was seen in (76%) cases irrespective of the site of perforation. 42 cases (66.67%) had raised total leucocyte count, 13 cases (20.63%) had raised serum creatinine, hypokalemia in 6 cases (9.52%) and hyponatremia in 9 cases (14.29%). **Shahida Parveen Afridi et al** in 2008¹⁴ found that electrolyte imbalance, hypokalemia 60%, hyponatremia 45%, raised blood urea and Creatinine 9%. The most common site of perforation was Duodenum in 41 cases (65.05%), followed by appendix in 13 cases (20.63%), 5 cases (7.94%) of ileal perforation, 3 were gastric antral perforation (4.76%) and 1 case of jejunal perforation (1.59%). **Anjaneya T et al(2019)**⁸ found that Duodenum was the most common site of perforation 70% cases, followed by appendix 10% cases, ileal 8% cases, jejunal 6% cases, gastric 6% cases.

The most common etiology of perforation was Peptic ulcer disease in 69.84% cases, followed by Acute appendicitis in 20.63 % cases, Abdominal tuberculosis in 6.35% cases and 1.59% cases of Typhoid fever. **Sachin Sharma et al(2019)**¹⁵ found that Acid peptic disease (48.92%) was most common etiology, followed by typhoid (13.21)

In our study
44 cases of gastroduodenal perforation out of which 41 cases (65.05%) underwent Modified Graham Patch Repair, 3 cases (4.76%) underwent Laparoscopic modified Graham Patch repair, 2 cases (3.17%) underwent Primary repair in two layers using Silk and Vicryl for ileal perforation, 2 cases (3.17%) underwent Resection and anastomosis with Ileostomy for ileal perforation, 1 case of ileal perforation was managed with ileostomy and for 1 case of jejunal perforation jejunostomy was done. Appendicectomy was done in 13 cases (20.63%), and acute appendicitis (10.3%), tuberculosis (11.07%). **Laxmi Narayan Meena et al(2017)**¹⁶ had performed most commonly Simple closure with or without omental patch in 63.80% cases, followed by stoma formation in 17.42% and appendicectomy in 7.91% cases.

Wound infection was the most common post operative complication in 21 cases (33.33%), Respiratory infection in 17 cases (26.98%), Dyselectronemia in 12 cases (19.05%) and Sepsis in 11 cases (17.46%), mean stay was 11.75 ± 4.13 days with minimum hospital stay being 6 days and maximum being 23 days, morbidity was 53.97% with mortality being 4.76%. **Neeraj Kumar Jain et al.** (2017)¹⁰ found that wound infection was the most common complication in 26.36% cases, electrolyte imbalance in 21.81 % cases, septicemia in 10.09% cases and respiratory complications in 9.09% cases. **Vinod Kumar Beta et al(2014)**³ in their study found that average duration of stay in the hospital for hollow viscous perforation was 13 days (2-44 days). **Sudhanshu Sarkar et al** in 2018¹⁷ found the mortality rate to be 4%. **Anjaneya T et al** in 2019⁸ found 3 deaths out of 50 cases, mortality being 6%.

CONCLUSION

Non Traumatic Hollow Viscus Perforation remains to be one of the most common causes of acute abdomen and the most common surgical emergency. It is most commonly seen in young and middle aged people

where males are more affected than females. In our study, the Spectrum of etiology, clinical presentation, management and complications were studied over 63 patients, males were more affected than females, peak incidence was between 30-39 years age. Pain abdomen was the most common presenting symptom with guarding/rigidity the most common sign. Diagnosis was made on the basis of history, clinical examination and radiological investigation. Abdominal Erect Xray showed free gas under diaphragm in 73.02% cases. Most Cases presented during 48-72 hours of perforation. Immediate resuscitation and appropriate surgical treatment was done depending upon the site of perforation. Duodenum was the most common site of non traumatic hollow viscus perforation. Peptic ulcer perforations remain the most common cause of Non Traumatic Hollow Viscus Perforation India. This could be due to the fact that most of the patients were from lower economic strata. Smoking, alcohol use and inadvertent use of analgesics remain important risk factors. Wound infection was the most common post operative complication. Delay in presentation, decrease immunity and poor general condition of patients add to postoperative morbidity.

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