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## Clinical profile and histopathological correlation of non-traumatic small bowel perforations

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### Abstract

Non-traumatic perforation of small intestine is a common cause of peritonitis in developing countries requiring early surgical intervention. Various etiological factors have been proposed as the cause of small bowel perforation. It is difficult to diagnose cause of non-traumatic perforation of small bowel pre-operatively, so histopathology is a very important diagnostic tool. In this study consisting 40 patients, non-traumatic perforations were more common in males (72.5%) than females (27.5%) with maximum number of non-traumatic perforations (42.5%) occurring in the age group of 21-40 years and the minimum number (12.5%) occurring in the age group of  $\leq 20$  years and  $>60$  years, each. The most common etiology was nonspecific ileitis followed by tuberculosis, neoplasms and then, enteric fever.

**Keywords:** Small bowel perforation, non traumatic perforation

### Introduction

#### Background

Intestinal perforation is a common cause of peritonitis necessitating immediate surgical intervention. Non traumatic perforation of small intestine refers to those perforations in which external trauma as an aetiology has been excluded<sup>[1, 2]</sup>. Despite many advances in perioperative care, antimicrobial therapy and intensive care support, patients with peritonitis still suffer a high morbidity and mortality which ranges between 20% to 36%<sup>[3-6]</sup>. Various aetiologies have been suggested for non-traumatic perforation of small intestine however, the distribution of these aetiologies is different in various parts of world.

In developed countries the common cause of non-traumatic perforation of small intestine is mostly attributable to foreign bodies, Crohn's disease, primary ischemic events, and as a part of systemic disorders<sup>[7-9]</sup>. However, in developing countries infectious conditions like typhoid and tuberculosis predominate the aetiology of non-traumatic perforation of small intestine<sup>[9, 11]</sup>. Preoperative diagnosis of aetiology of non-traumatic perforation of small intestine is difficult, hence histopathological diagnosis is of great significance. This study was carried out to evaluate the patterns of different aetiologies of non-traumatic perforation of small intestine.

### Materials and Methods

It was a prospective study for one and half year. It included all patients above 18 years of age undergoing surgery for non-traumatic spontaneous small bowel perforation. A thorough history was taken and detailed examination was done. Appropriate investigations were sent as per requirement. After resuscitation, the patients were taken up for Exploratory Laparotomy under general anaesthesia. Operative findings were recorded and edge biopsy at the perforation site or the resected specimen was sent for histopathological examination. The data collected was analysed statistically using SPSS version 16. Duodenal small bowel perforations were not included as biopsy is not taken.

### Results and Analysis

Non traumatic perforations were more common in males (72.5%) than females (27.5%). Maximum number of non-traumatic perforations (42.5%) occurred in the age group of 21-40 years and the minimum number (12.5%) occurred in the age group of  $\leq 20$  years and  $>60$  years, each.

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Maximum number of non-traumatic perforations in the age group of > 60 years were secondary to tumours (60%). p value of 0.01 was obtained, signifying a significant number of perforations in the elderly age group were caused by tumour.

Majority of perforations caused by tumours, occurred in males (80%). Also, tubercular and enteric perforations (75%) each, were found to be more common in males. Similarly, nonspecific perforations (68.18%) also affected males more commonly. Correlation of gender with different kinds of perforations however, was found to be statistically non-significant (p value > 0.05). Majority (42.5%) of non-traumatic small bowel perforation presented during the first week of fever, and 7.5% patients presented after 2 weeks of fever. 62.5% subjects with tubercular perforations, 60% patients with perforation secondary to tumour gave no history of fever. This was found to be statistically significant (p value 0.006).

Maximum number of non-traumatic perforation presented within 24 to 48 hours of onset of pain (67.5%) while only a few (5%) presented within 12 hours of onset of pain. Four subjects (100%) with typhoid perforation, and 16 subjects (72.73%) of non-specific perforation presented within 24-48 hours of onset of pain while 40% of perforations caused due to tumour presented after 48 hours of onset of pain. This was not found to be of statistical significance as p value is >0.05. Only 5% of patients with tubercular perforation peritonitis had previous history of tuberculosis. 15% of patients with non-traumatic perforations were diabetic and 7.5% were hypertensive.

Out of 40 patients, 55% patients with non-traumatic small bowel perforation had a normal total leucocyte count. Leukocytosis was observed in 35% patients and 10% of subjects showed leukopenia. One subject (100%) with Meckel's diverticulitis, 2 subjects (9.09%) with non-specific ileitis and 1 subject (12.5%) with tubercular perforation had leukopenia. This was found to be statistically significant (p value < 0.05). While 10 subjects (45.45%) with nonspecific ileitis, 2 subjects (40%) perforation secondary to tumours, and 2 subjects (25%) with tubercular perforation had leukocytosis. Only 2 patients out of 4 with enteric fever (50%) had a positive widal test. Chest X-ray was done for all 40 patients of non-traumatic small bowel perforation, of which 29 patients (72.5%) showed air under the diaphragm.

Maximum number 33 (82.5%) of non-traumatic small bowel perforations were in ileum. While 7 patients (17.5%) presented with perforations in jejunum. 100% patients of enteric perforation, 90.91% of patients with non-specific ileitis, 75.00% patients of tubercular perforation and 40% perforations secondary to tumour had ileum as the site of involvement. Whereas 60% patients of tumour and 25% patients of tuberculosis had jejunum as the site involved. However no statistical significance (p value > .05) was observed between the site of perforation and the type of non-traumatic small bowel perforation.

Out of 40 patients 35 (87.5%) patients had single perforation, 3 patients (7.5%) had 2 perforations, while only 1 patient each (2.5%) had three or more perforations. Four patients (100%) of enteric perforation, 19 patients (86.36%) of non-specific ileitis and 7 patients (87.5%) of tubercular perforation had single perforation. While 2 patients (9.09%) of non-specific perforation and 1 patient (12.5%) of tubercular perforation had two perforations. One patient with non-specific ileitis had three perforations and only 1 patient (4.55%) with perforation secondary to tumour had multiple perforations. However no statistical significance (p. value > .05) was observed between number of perforations and non-traumatic small bowel

perforations.

Sixteen patients (40%) of non-traumatic small bowel perforation underwent loop ileostomy. 9 patients (22%) underwent resection and anastomosis, followed by 6 patients (15%) who underwent primary repair of perforation and proximal loop ileostomy. While 2 patients (5%) underwent right hemicolectomy and primary repair of perforation, each.

As per histopathology report, non-specific ileitis (55%) is the most common type of perforation encountered. This was followed by tubercular perforation which involved 8 patients (20%). Third most common category was perforation secondary to tumours (12%), followed by enteric perforation (10%). Only 1 patient (2.5%) was reported to have perforation secondary to Meckel's diverticulitis.

### Summary and Conclusion

Non traumatic perforations of small bowel are perforations, where trauma is excluded as an etiology. This condition is a common cause of perforation peritonitis in developing nations. Diagnosis of non-traumatic perforation is a challenge preoperatively as clinical findings are usually nonspecific and definitive diagnosis can be reached after histopathology. Histopathological examination is an important part of management, even though a significant number of specimens may be nonspecific. This is particularly important in cases where the etiology is potentially treatable. In this study, the most common etiology was nonspecific ileitis followed by tuberculosis, neoplasms and enteric fever. Neoplasms are common cause of perforation in developed countries while infectious diseases like tuberculosis and typhoid are more common causes of perforations in developing countries. The present study however revealed higher number of neoplasms than typhoid, which may suggest an increasing incidence of neoplasms in the developing countries too.

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