

Original Research Article

# Clinicopathological study of ileal perforation in tertiary centre

R Abraham Jebakumar<sup>1</sup>, Sriramchristopher M<sup>2\*</sup>

<sup>1</sup>Assistant Professor, <sup>2</sup>Post Graduate

Department of General Surgery, Govt. Stanley Medical College, Chennai, Tamil Nadu, India

\*Corresponding author email: [sriramchristopher@gmail.com](mailto:sriramchristopher@gmail.com)

	International Archives of Integrated Medicine, Vol. 6, Issue 1, January, 2019.	
	Copy right © 2019, IAIM, All Rights Reserved.	
	Available online at <a href="http://iaimjournal.com/">http://iaimjournal.com/</a>	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 15-12-2018	Accepted on: 24-12-2018
	Source of support: Nil	Conflict of interest: None declared.
<b>How to cite this article:</b> R Abraham Jebakumar, Sriramchristopher M. Clinicopathological study of ileal perforation in tertiary centre. IAIM, 2019; 6(1): 70-75.		

## Abstract

**Background:** Perforation of terminal ileum is a cause for obscure peritonitis with severe toxic state, there may be obscured clinical features with resultant delays in diagnosis and adequate surgical intervention. The objective of this study was to evaluate the clinicopathological characteristics in Ileal perforations because of confusion and controversy over the diagnosis and optimal surgical treatment of terminal Ileal perforation -a cause of obscure peritonitis.

**Materials and methods:** Patients underwent emergency explorative laparotomy for hollow viscus perforation surgery in general surgery department was included in present study. Edge biopsy specimen was sent to histopathological examination. All patients were tested for widal positivity and were started on anti- salmonella treatment if it was positive. Based on intra- operative finding and histopathological reports, ATT was started for those who are positive for tuberculosis. All patients were monitored in the post-operative period for complications. All patients were followed up for a period of six months.

**Results:** A total of 60 patients with Ileal perforation were included in the study of which 50 were males and 10 were females accounting for 83.33% and 16.67 % respectively. The most common symptom was pain abdomen which was present in all the patients (100%). The next common symptom was vomiting seen in 44 out of 60 patients (73.33%) followed by fever seen in 38 out of 60 patients (63.33%). Absent bowel sounds was found in 36 out of 60 patients (60%). Air under diaphragm on erect X-ray abdomen was found in 56 patients (93.33%).

**Conclusion:** Bacterial culture and tissue histopathology though confirmatory are time consuming, and immunological tests are expensive. And administration of ATT helped to treat the patients successfully. A high index of suspicion for intestinal tuberculosis is needed in patients who are on immunosuppression.

## Key words

---

Ileal perforation, Clinicopathological study, Tertiary centre.

## Introduction

---

The objective of this study was to evaluate the clinicopathological characteristics in Ileal perforations because of confusion and controversy over the diagnosis and optimal surgical treatment of terminal Ileal perforation -a cause of obscure peritonitis. Perforation of terminal ileum is a cause for obscure peritonitis with severe toxic state, there may be obscured clinical features with resultant delays in diagnosis and adequate surgical intervention. Hollow viscus perforation leading to peritonitis is one of the commonest emergency surgeries conducted in a surgical practice for a case of acute abdomen. It is the second most common cause for acute abdomen following appendicitis. Perforation as a cause of acute abdomen accounts for 30-40% of the total cases of acute abdomen presenting to a surgical emergency. Among the cases of hollow viscus perforation duodenal and gastric perforations are the commonest accounting to almost 60-80% in some series, followed by ileal, appendicular and large bowel.

## Aim and objectives

---

- To determine the frequency of ileal perforation in acute abdomen.
- To determine the etiological factors in ileal perforations.

## Materials and methods

---

**Study design:** Observation study

**Sample size:** 60

**Inclusion criteria:** Patients undergoing emergency explorative laparotomy for hollow viscus perforation surgery in general surgery department

### Exclusion criteria:

- Patients with hollow viscus perforation except ileal perforation.
- Patient refused to undergo laparotomy.
- Patient who had history of trauma

- Age <15 years

Written informed consent was obtained from all subjects before enrolment in the study. All patients who underwent emergency laparotomy, perforation was identified, edge biopsy was taken in all cases. Edge biopsy specimen was sent to histopathological examination. All patients were tested for widal positivity and were started on anti- salmonella treatment if it was positive. Based on intra- operative finding and histopathological reports, ATT was started for those who are positive for tuberculosis. All patients were monitored in the post-operative period for complications. All patients were followed up for a period of six months. All details regarding the study were recorded according to the pre designed proforma.

## Results

---

A total of 60 patients with Ileal perforation were included in the study of which 50 were males and 10 were females accounting for 83.33% and 16.67% respectively.

The most common age group in our study was 40-50 years with 24 patients belonging to this age group, followed by 30-40 years. The median age was 43 years.

The most common symptom was pain abdomen which was present in all the patients (100%). The next common symptom was vomiting seen in 44 out of 60 patients (73.33%) followed by fever seen in 38 out of 60 patients (63.33%).

Absent bowel sounds was found in 36 out of 60 patients (60%). Air under diaphragm on erect X-ray abdomen was found in 56 patients (93.33%).

On laparotomy, Ileal perforation alone was found in 60 patients. Two patients had a stricture just distal to their perforation (3.33%), two had tubercles studded on the mesentery and the

surface of the bowel (3.33%) and one had extensive adhesions between the bowel loops (1.67%) along with the perforation.

Among the 60 cases with Ileal perforation alone, a solitary perforation was found in 44 patients (73.33%), 2 perforations in 10 patients (16.67%) and 3 or more perforations in 5 patients (8.33%). In cases with 2 or fewer perforations, a primary closure was done and in the rest a primary resection and anastomosis was done. Among the 60 cases, 43 (71.67%) were found to be secondary to tuberculosis based on Mantoux test or histo-pathological findings and the other 2 (3.33%) were diagnosed to be non-specific. The other 15 cases (25%) were found to be secondary to granulomatous disease most likely to be abdominal tuberculosis.

All patients were given antibiotics post operatively specific to their condition or based on culture and sensitivity report of the peritoneal fluid in non-specific cases.

Patients were followed up in the post-operative period for the development of complications. 12 out of 60 patients had a wound infection (20%). 10 patients had sepsis continuing post operatively as manifested by fever and increased leukocyte count. Lower respiratory infection was seen in 16 patients (26.67%) manifested by cough and crepitations. Wound dehiscence was seen in 1 patient (1.67 %). 2 patients (3.33 %) developed signs of sepsis and MODS post operatively and could not be revived, one of whom expired on the first post-operative day and the other on day 3.

All patients were discharged after 5 days in case of uneventful post-operative period and then followed up for a total duration of 6 months. Histopathological report was reviewed following surgery.

## **Discussion**

The terminal Ileal perforation presents a diagnostic dilemma to the surgeon. Non-

traumatic terminal Ileal perforation is still common as a cause for obscure peritonitis in developing and underdeveloped world [1]. In developed countries, spontaneous Ileal perforations are reported to be mostly because of foreign bodies, radiotherapy, drugs, Cohn's disease and malignancies [2, 3]. The common pathology of Ileal perforation are typhoid, nonspecific ulcer, obstruction, tuberculosis, radiation enteritis. Typhoid fever also known as enteric fever, a severe febrile infectious disease caused by *Salmonella typhi* and *salmonella para typhi* occurs in areas where poor socioeconomic levels and unsanitary environment. The majority of cases in endemic countries are due to *S. typhi*, while infection by *S. paratyphi* is more common among travellers [4-7].

After ingesting contaminated food or water, during the first week of infection multiplication of bacteria occurs in the reticuloendothelial system during an incubation period of 1-14 days. During the enteric phase of typhoid fever, distinctive lesions develop restricted to the solitary lymphoid follicles or lymphoid aggregates of the mucosa, especially in the ileum. The leucocyte response is lymphoplasmacytic in type and is typically accompanied by cells of the mononuclear phagocyte system, which usually have swollen eosinophilia cytoplasm often containing ingested nuclear debris and red cells (typhoid histiocytes) [8-13].

During the second week, these typhoid bacilli infect the macrophages and they undergo a massive proliferation. The bacteria become localized in Payer's patches. Small bowel is swollen, congested and distended. The mesenteric lymph nodes are enlarged. *Salmonella* also invades the intestinal epithelial cells.

The mechanism of intestinal perforation in typhoid fever is hyperplasia and necrosis of Payer's patches of the terminal ileum. Payer's patches become deeply ulcerate typically forming oval, longitudinal ulcers (with the long axis along the length of the intestine) [10].

Ulceration progress to capillary thrombosis and subsequent necrosis. These ulcerations are always located on the ant mesenteric border of the intestine and may perforate, usually in 3<sup>rd</sup> week of disease [10]. The gut in typhoid fever is edematous and friable (especially last 60 cm). There may be one or several perforations and many other impending perforations, which makes the surgery difficult [1].

An increase in titer of agglutinins against the somatic (O) and flagellar (H) antigens of *S typhi* occurs (basis for Widal test). Histopathologically the ulcerated area in intestine show macrophages containing engulfed nuclear debris along with RBCs (erythrophagocytosis). Lymphocytes and plasma cells are also present. Neutrophils are spares, except near the ulcerated surface. Bloody diarrhea occurs during this phase. The commonest complications of a typhoid ulcer are hemorrhage and perforation with peritonitis.

The bacteria disseminates throughout the body via the blood vessels and lymphatics. Liver shows areas of necrosis and typhoid nodules (aggregates of macrophages). The spleen is enlarged and soft with prominent phagocyte hyperplasia. Ileal perforation is predominantly seen in male patients.

Clinical manifestations start with bacteremia, high-grade fever, signs of systemic sepsis with characteristic normal or low blood counts and anemia. Pain abdomen as a symptom is most common in cases of perforation and was seen in 100% of our cases. This was also shown in studies by Khalid S, et al. [4]. In their study of 125 cases and reported pain abdomen in 100% of patients.

The clinical features in our study were similar to any other acute abdominal condition. The decision for a laparotomy was mainly clinical supplemented by investigations. However no single investigation was specific. The delay in operation since the estimated time of perforation was mainly prehospital. This is due to the fact

that there most of the cases came from remote areas where the medical facilities are scarce [1].

The need for aggressive fluid resuscitation and correction of electrolyte derangements and anemia; suitable antibiotic combination is crucial to surgical outcomes. Typhi is very sensitive to antimicrobial agents. The timing of antimicrobial therapy could be critical in preventing serious complications such as perforation [7]. The antibiotic protocol is to cover for not only the *Salmonella* organism but also for anaerobes and gramnegative coliforms. The emergence of chloramphenicol resistant, *Salmonellae*, has led to the use fluoroquinolones (for example, ciprofloxacin), or third generation cephalosporins [5]. Enteric perforation being extremely rare in developed countries during the era of antibiotic use supports the early use of effective antibiotics in patients with typhoid fever [5]. In this study we have used piperacillin with tazobactam, metrogyl and amikacin.

Prompt surgery after adequate resuscitation, is the treatment of choice for typhoid perforation; this has considerably reduced mortality from 30-60% to approximately 6.8% in a recent series [12, 13]. The presence of single Ileal perforations in majority 74.58% of our patients is consistent with other reports. All of our patients were operated under general anesthesia. Simple debridement and repair of perforation is shown to be effective. Operative procedures carried out were, namely, repair and resection and anastomosis. The classical disposition of the typhoid perforation in the longitudinal axis of the ileum and on the antemesenteric border with an antecedent history of prolonged febrile illness who did not respond to antimalarial, is enough to make a conclusion as to the etiology of the perforation.

To be certain that the perforation on the ileum is due to typhoid enteritis, a positive blood, stool or urine culture is necessary. However, the yield for blood culture in a patient with typhoid intestinal perforation is low, ranging from 3-34% [9]. Higher yields of the *Salmonella* organism are

obtained from cultures of the perforation edges, bone marrow, or peritoneal aspirates. Even when they are done the results do not significantly alter the operative treatment given to the patient.

Case fatality rate and length of hospital stay among patients with typhoid intestinal perforation in developing countries: a systematic literature review by Vital Mogasale states four important global public health implications [6].

- First, typhoid intestinal perforation CFR is high even today in Africa and Asia, alerting to the importance of typhoid prevention and control activities in those regions.
- Second, to reduce typhoid intestinal perforation burden by improving access to care, aggressive resuscitation, better surgical facilities and use of appropriate antibiotics.
- Third longer hospital stays are associated higher treatment costs, and greater loss of productivity. Warrants prevention activities in some regions where even if incidence is not that high.
- Fourth, it provides some basic information needed for estimating disease and economic burden of typhoid in developing countries [6].

In this histopathology reports Nonspecific inflammation of the terminal ileum was another predominant cause. In such cases, the operative findings were similar to that of typhoid fever but no laboratory evidence of the disease was found. Thin layer of necrotic fibrinous purulent exudate covers histopathology report revealed the ulcer base. Beneath this is a zone of infiltrate consisting chiefly of neutrophils, below this is a zone of granulation tissue formation which is infiltrated by lymphocyte histiocytes. Fibrocollagenous scar is seen deeper to the granulation tissue.

Abdominal tuberculosis constitutes a significant of all cases attending the emergency with an acute abdomen [7]. Abdominal Tuberculosis

with an acute abdomen presents as an enormous challenge to the surgeon. clinical judgment and surgical acumen to determine the extent of surgical management in an unprepared compromised patient in the emergency setting is needed.

The initial clinical presentations are nonspecific. Commonest pathological change found are the presence of intestinal stricture, often multiple in number with or without presence of perforation situated proximally. The surgeon has to collect sufficient pathological tissue for histopathology and microbiology to overcome the diagnostic dilemma. The choice of surgical procedure depended on site and extent of disease, status of the remaining gut, general condition of the patient, surgeon's expertise. Abdominal Tuberculosis includes tuberculosis infection of gastrointestinal tract, mesentery, lymph nodes and omentum, the peritoneum and related solid organs such as liver and spleen [8].

Secondary tuberculosis usually involves the terminal ileum and caecum. Two types of lesions occur ulcerative and hyperplastic. The ulcerative type commonly affects the ileum. The lesions being in the lymphoid tissue of the intestine, the infection spreads through the lymphatics, which run in a circumferential fusion in the bowel wall. Hence, transverse ulcers are produced (i.e. with long axes perpendicular to the length of the intestine) the serosa is often studded with tubercles. The draining lymph node also shows granulomas. The ulcers heal by fibrosis with the resultant formation of transverse strictures, which cause intestinal obstruction [10]. No single laboratory investigation is pathognomonic [11].

## **Conclusion**

Bacterial culture and tissue histopathology though confirmatory are time consuming, and immunological tests are expensive. And administration of ATT helped to treat the patients successfully. A high index of suspicion for intestinal tuberculosis is needed in patients who are on immunosuppression.

## References

---

1. Wani RA, Parray FQ, Bhat NA, Wani MA, Bhat TH, Farzana F. Non-traumatic terminal Ileal perforation. *World J Emerg Surg.*, 2006; 1: 7.
2. Karmacharya B, Sharma VK. Results of typhoid perforation management: our experience in Bir Hospital. *Nepal Kathmandu University Medical Journal*, 2006; 4(13): 22-4.
3. Abdullah MS, Rassam RE, Almarzooq TJ. A study of 82 patients of non-traumatic terminal Ileal perforation in al-kindy teaching hospital. *J Fac Med Baghdad*, 2011; 53(2): 148.
4. Khalid S, Burhanulhuq, Bhatti A. Non-traumatic spontaneous Ileal perforation: experience with 125 cases. *J Ayub Med Coll Abbottabad*, 2014; 26(4).
5. Nuhu A, Dahw S, Hamza A. Operative management of typhoid Ileal perforation in children. *African J Pediatr Surg.*, 2010; 7(1): 9-13.
6. Mogasale V, Desai SN, Mogasale VV, Park JK, Ochiai RL, Wierzba TF. Case fatality rate and length of hospital stay among patients with typhoid intestinal perforation in developing countries: a systematic literature review. *PLOS ONE*, 2014; 9(4): e93784.
7. Hosoglu S, Aldemir M, Akalin S, Geyik MF, Tacyildiz IH, Loeb M. Risk factors for enteric perforation in patients with typhoid fever. *Am J Epidemiol.*, 2004; 160: 46-50.
8. Mukhopadhyay A, Dey R, Bhattacharya U. Abdominal tuberculosis with an acute abdomen: our clinical experience journal of clinical and diagnostic research. *J Clin Diagnost Res.*, 2014; 8(7): NC07-NC09.
9. Chan D, Lee KC. Perforated intestinal tuberculosis in a non-AIDS immunocompromised patient. *Am J Case Rep.*, 2015; 16: 719-22.
10. Bhardwaj JR. Chief editor, Prabal deb associate editor, Boyd's Text book of pathology 10<sup>th</sup> edition, Vol 2, Systemic Pathology, Wolters Klower Health (India); 2013, p. 938-940.
11. Babu RG, Malolan A, Chowdary PB. Ileostomy for non-traumatic Ileal perforation: is this the beginning of the end. *J Clin Diagn Res.*, 2016; 10(3): PC23-6.
12. Archampong EQ. Typhoid Ileal perforation: why such mortality. *Br J Surg.*, 1976; 63: 317-21.
13. Akoh JA. Prognostic factors in typhoid perforation. *East Afr J Med.*, 1992; 70: 18-21.