

# Assessment of Small Bowel Obstruction in Patients Following Appendicitis: An Institutional Based Study

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## ABSTRACT

**Background:** Small bowel obstruction (SBO) is a pathological condition which occurs when the intestinal contents are prevented from moving along the length of the intestine. The present study was conducted to assess the cases of small bowel obstruction following appendectomy.

**Materials & Methods:** The present study was conducted on 42 cases of appendicitis of both genders. In all patients, laparoscopic appendectomy was planned. Patients were recalled to note any kind of complication arising from the procedure.

**Results:** Out of 42 patients, males were 26 and females were 16. Age group 20-30 years had 5 males and 3 females, 30-40 years had 9 males and 5 females and 40-50 years had 12 males and 8 females. The difference was significant ( $P < 0.05$ ). Macroscopic feature of appendix during procedure was phlegmonous in 12 and gangrenous in 30 cases. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Small bowel obstruction is a complication which

may be seen in few cases of appendectomy.

**Key words:** Appendectomy, Phlegmonous, Small Bowel Obstruction.

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## INTRODUCTION

Appendectomy is one of the most common procedures performed which may be due to appendicitis or frequent pain in appendix. However, postoperative small bowel obstruction is considered as long term adverse effect of appendectomy. There is 0.2-10.7% prevalence rate of this complication.<sup>1</sup>

They can have serious consequences for patients such as infertility, chronic abdominal pain or bowel obstruction. The management of intestinal adhesions depends on the symptoms and physical signs of the patients. Small bowel obstruction (SBO) is a pathological condition which occurs when the intestinal contents are prevented from moving along the length of the intestine. There are 2 types of small bowel obstruction, mechanical and neurogenic.<sup>2</sup> Mechanical SBO is due to physical occlusion, either external or internal, of the gastrointestinal lumen. Neurogenic SBO results from intestinal paralysis.<sup>2</sup>

Acute intestinal obstruction occurs when there is an interruption in the forward flow of intestinal contents. This interruption can occur at any point along the length of the gastrointestinal tract, and clinical symptoms often vary based on the level of obstruction.

Intestinal obstruction is most commonly caused by intra-abdominal adhesions, malignancy, or intestinal herniation. The clinical presentation generally includes nausea and emesis, colicky abdominal pain, and a failure to pass flatus or bowel movements. The classic physical examination findings of abdominal distension, tympany to percussion, and high-pitched bowel sounds suggest the diagnosis.<sup>3</sup> Hence; under the light of above mentioned data, the present study was undertaken for assessing patients with small bowel obstruction in patients following appendicitis.

## MATERIALS & METHODS

The present study was conducted in the Department of General Surgery and Department of Obstetrics and Gynaecology, Vedantaa Institute of Medical Sciences, Palghar, Maharashtra, India.

It consisted of 42 cases of appendicitis of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was taken before starting the study. Data

related to patients such as name, age, gender etc. was recorded. In all patients, laparoscopic appendectomy was planned. Patients were recalled to note any kind of complication arising from the

procedure. Results thus obtained were subjected to statistical analysis using chi-square test. P value less than 0.05 was considered significant.

**Table I: Distribution of patients**

Total- 42		
Gender	Males	Females
Number	26	16

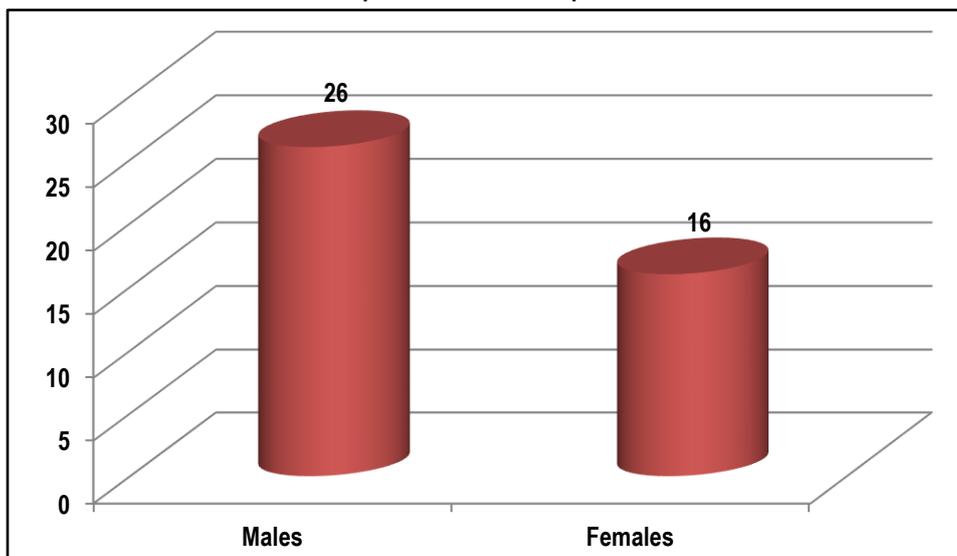
**Table II: Age wise distribution of patients**

Age groups (years)	Males	Females	P value
20- 30	5	3	0.01
30-40	9	5	
40- 50	12	8	

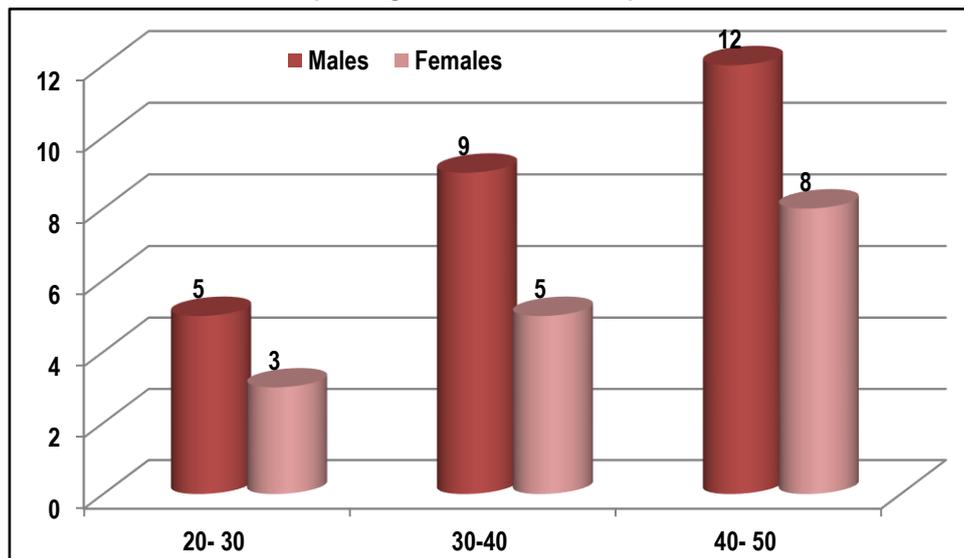
**Table III: Macroscopic feature of appendix during procedure**

Macroscopic feature	Number	P value
Phlegmonous	12	0.02
Gangrenous	30	

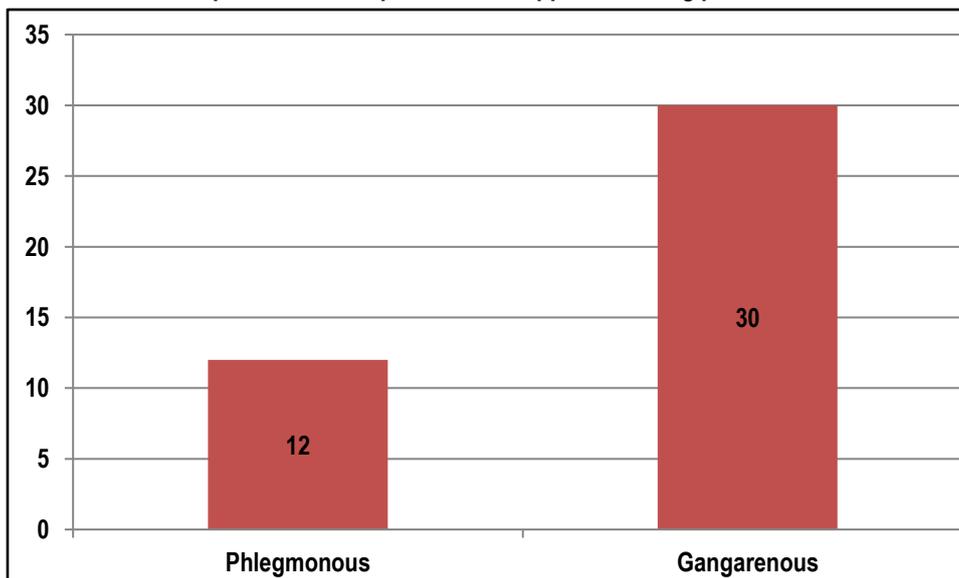
**Graph I: Distribution of patients**



**Graph II: Age wise distribution of patients**



**Graph III: Macroscopic feature of appendix during procedure**



**RESULTS**

Table I shows that out of 42 patients, males were 26 and females were 16. Table II, graph II shows that age group 20-30 years had 5 males and 3 females, 30-40 years had 9 males and 5 females and 40-50 years had 12 males and 8 females. The difference was significant ( $P < 0.05$ ). Table II, graph II shows that macroscopic feature of appendix during procedure was phlegmonous in 12 and gangrenous in 30 cases. The difference was significant ( $P < 0.05$ ).

**DISCUSSION**

The description of patients presenting with small bowel obstruction dates back to the third or fourth century, when early surgeons created enterocutaneous fistulas to relieve a bowel obstruction.<sup>4</sup> Despite this success with operative therapy, the nonoperative management of these patients with attempted reduction of hernias, laxatives, ingestion of heavy metals (e.g., lead or mercury), and leeches to remove toxic agents from the blood was the rule until the late 1800s, when antisepsis and aseptic surgical techniques made operative intervention safer and more acceptable. Small bowel obstruction is a relevant clinical condition that can happen after an Intra-abdominal surgical intervention due to the development of peritoneal adhesions between abdominal tissues and organs.<sup>5</sup> These adhesions are also called “flanges” by surgeons. Common pathophysiologic mechanisms leading to physical obstruction of the small bowel include postoperative adhesions, internal hernia, congenital bands, external hernia, post inflammatory adhesions, inflammatory bowel disease and carcinoma. Less common causes are foreign bodies, intussusception and tuberculosis. Carcinoma, diverticulitis and volvulus are major mechanisms of large bowel obstruction.<sup>6</sup> Mechanical small-bowel obstruction is the most frequently encountered surgical disorder of the small intestine. Although a wide range of etiologies for this condition exist, intraabdominal adhesions related to prior abdominal surgery is the etiologic factor in up to 75% of cases of small-bowel obstruction. More than 300,000 patients are estimated to undergo surgery to treat adhesion-induced small-bowel obstruction in the United States annually.<sup>7</sup> The present study was conducted to assess the cases of small bowel obstruction following appendectomy.

In present study, out of 42 patients, males were 26 and females were 16. Age group 20-30 years had 5 males and 3 females, 30-40 years had 9 males and 5 females and 40-50 years had 12 males and 8 females. The difference was significant ( $P < 0.05$ ). Chakarwoty et al<sup>8</sup> conducted a study in which patients in delayed postoperative period were managed by conservative treatment in 7 cases and by open surgical intervention in 1 case. The mean onset of enteral feeding was 1.4 days and the mean of length of stay was 5.3 days. This complication was observed in a range of time intervals from 10 days to 9 years after the first surgical intervention.

We found that macroscopic feature of appendix during procedure was phlegmonous in 12 and gangrenous in 30 cases. Successful laparoscopic surgery for bowel obstruction is being reported with greater frequency. Reported data suggest that up to 60% of small-bowel obstruction cases caused by adhesions may be amenable to laparoscopic therapy. The reported conversion rate is 20-51.9% and the complication rate (bowel injury) is 6.5-18.0%. Conversion to open procedure has been reported secondary to density of adhesions, inability to fix the obstruction, cause of obstruction not amenable to laparoscopic therapy, intestinal necrosis, and intestinal perforation.<sup>9</sup> Factors that favor laparoscopic success are SBO post appendectomy, with bands as cause, with less than two previous surgeries, and shorter time of symptoms. It has been reported that conversion rate can be decreased to as low as 6.9% when the surgery is guided by preoperative enteroclysis. The laparoscopic treatment of small bowel obstruction appears to be effective and leads to a shorter hospital stay in a highly selected group of patients. Gamal et al<sup>10</sup> in their study found 6 patients developed SMO out of 607 patients who were treated with laparoscopic appendectomy. Frequency of readmission of patients features of intestinal obstruction ranged from 1-6. Tseng CJ et al assessed risk factors for SBO following appendectomy. They evaluated adult patients with acute appendicitis who underwent open (OA) or laparoscopic appendectomy (LA) between January 1, 2006 and December 31, 2008. Excluded were patients with a history of abdominal surgery and SBO before the index operation, or abdominal surgery between the appendectomy and initial diagnosis of bowel obstruction as an identifiable cause of SBO.

Factors thought to influence postoperative SBO were highlighted. The OA and LA cohorts were matched by propensity score, and the hazard ratios (HRs) and 95% confidence interval (CIs) of SBO were calculated. They enrolled 11,289 patients who underwent OA, and 11,289 matched controls who underwent LA. OA patients had significant risk of adhesive SBO compared with the LA group (adjusted HR: 1.7, 95% CI: 1.11–2.63). Further analysis revealed that that female sex (adjusted HR: 1.79, 95% CI: 1.17–2.72), CCI score of 1 or  $\geq 2$  (adjusted HR: 3.16, 95% CI: 1.76–5.67; adjusted HR: 4.03, 95% CI: 1.57–10.34), complicated appendicitis (adjusted HR: 1.68, 95% CI: 1.05–2.69), treatment in district hospitals increased risk of adhesive SBO. Female sex, complicated appendicitis, more comorbidities, and treatment in district hospitals are factors associated with a risk of SBO after appendectomy. Their findings confirmed that a laparoscopic approach is better than an open approach.<sup>11</sup> Migration of a surgical clip causing intestinal obstruction after laparoscopic appendectomy is a very rare complication.<sup>12</sup>

## CONCLUSION

Authors found that small bowel obstruction is a complication which may be seen in few cases of appendectomy.

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