

## Case Report

# Prank gone wrong, transverse colon perforation due to air compressor pipe placed in anus

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## ABSTRACT

Colonic perforation and pneumoperitoneum are the most commonly seen complications in cases of air entry into rectum at a high velocity in a short duration of time. Here we present a case of 24-year-old male who was brought to our emergency department with severe abdominal pain and distension for 2 hours. History suggestive of prank that went wrong, when somebody pumped high-pressure air from an air compressor into his anus while he was changing his clothes. The physical examination and investigations were suggestive of free gas in peritoneal cavity and the patient was taken for emergency exploratory laparotomy. On exploration, gaseous distention of whole colon was observed with serosal tear all along the colon with fresh bleeding. A rent of 1x1 cm seen in middle of transverse colon. The defect was closed primarily and a diverting loop ileostomy was made. Several number of cases of Air compressor abuse has been reported in literature as it is one of the non-iatrogenic cause of barotrauma to colon. It is usually seen when friends play prank on each other.

**Keywords:** Acute abdomen, Air compressor, Barotrauma, Emergency exploratory laparotomy, Transverse colon perforation

## INTRODUCTION

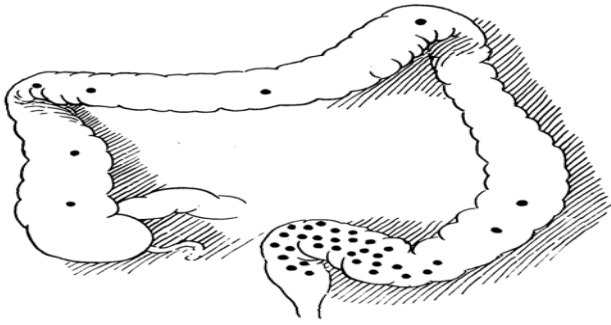
History of the barotrauma goes way back to 19<sup>th</sup> hundred when first such case was reported in 1904, which was the first fatal case of rupture of the bowel caused by compressed air introduced per rectum from a machine which was pumped by hand as stated by Stone.<sup>1</sup> In 1911, A pneumatic rupture of the sigmoid colon who recovered following resection of sigmoid colon was reported by Andrews.<sup>2</sup> He also discussed the subject completely and recorded 15 other cases collected by correspondence and from law reports. Later in 1911, Lenormant reviewed the previous papers on the barotrauma and discussed the subject editorially in the *Presse Medicale*, of Paris.<sup>3</sup> In 1912, Cotton reported another case of perforation of the ascending colon-he established a temporary colostomy at the site of the perforation and repaired several rents in the

serous and muscular coats of other portions of the colon and the patient recovered post operatively.<sup>4</sup> In 1914, Bendixen et al reported another recovery-a case of pneumatic rupture of the transverse colon, and gave brief notes on seven collected cases which were fatal.<sup>5</sup>

Colonic barotraumas are caused by increased pressure in the lumen, which lead to colonic mucosal injury and colonic perforation (Figure 1).<sup>6,7</sup> The most dangerous complications of air entry into rectum which occurs at a high volume and velocity in a short time frame are 1) sigmoid colon rupture and 2) pneumoperitoneum which is evident in our case too.<sup>8</sup>

In this study, we discuss a rare case of transverse colon perforation caused by barotrauma. Nowadays, compressed gases are used with increasing frequency in

daily industrial work, laboratories, and in gas stations, which make it handy with increasing incidence.



**Figure 1: Various sites of colonic perforation.**

The jets that are used in industry are usually said to have a pressure of 50 to 100 lbs. or more. Such an air jet enters the anus more readily than the examining finger or a proctoscope, as it passes through clothing and enters the bowel even when not accurately inserted inside the anus and lead to barotrauma.<sup>9</sup>

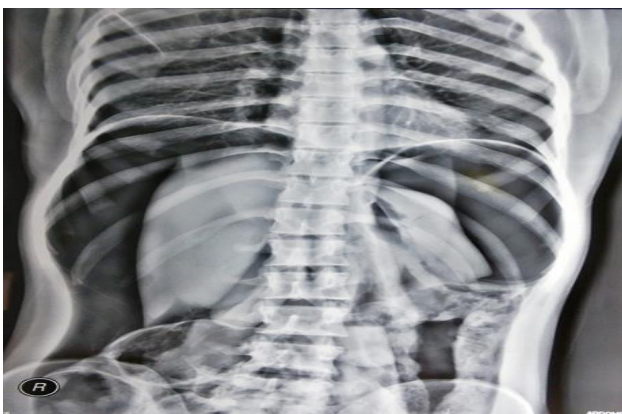
Rupture of the intestine perhaps depends more upon the suddenness of the pressure than upon its amount, for the bowel will expand enormously if given time to relax. Various colonic perforation sites are shown in the figure with recto sigmoid being the most common. (Figure 1).<sup>9</sup> Table 1 gives a brief summary of cases of rupture of the transverse colon due to compressed air that we have found in literature.

**Table 1: Summary of cases of rupture of the transverse colon.**

Author	Year	Age	Operation	Time after injury	Site of perforation	Result
Bendixen et al <sup>5</sup>	1912	20	Yes	2 Hours	Transverse colon	Recovered
Mulkipatil SY, et al <sup>6</sup>	2014	18	Yes	----	Transverse colon	Recovered
Edgar D, et al <sup>10</sup>	2014	4	Yes	Few Hours	Transverse colon	Recovered
Thirunavukkarasu S, et al <sup>11</sup>	2016	21	Yes	1 day	Transverse colon	Recovered
Present Study	2016	24	Yes	2 Hours	Transverse colon	Recovered

## CASE REPORT

A 24-year male patient was brought to the emergency department with acute onset of abdominal pain and distension for 2 hours. On enquiry, he gave history that someone brought the air insufflators tube at his anus while he was changing the clothes. On examination patient had tachycardia with a pulse of 110/minute, normal Blood pressure and respiratory rate. Abdominal examination revealed a distended and guarded abdomen with tenderness all over and absent bowel sounds. Per rectal examination revealed a ballooned rectum with fecal matter in it. X-ray chest and abdomen was showing free gas under diaphragm with grossly distended colon (Figure 2). Rest of investigation was unremarkable.



**Figure 2: X ray abdomen showing dilated colon loop.**

Based on these findings patient was taken for Exploratory Laparotomy. Abdomen opened with midline incision after giving general anesthesia. On exploration, it was found that whole colon from recto sigmoid to caecum was grossly distended without any distension of ileum or jejunum, which may be due to presence of ileocecal valve. There were multiple serosal tears all along the colon with a 1\*1 cm rent over the mesenteric border of mid transverse colon (Figure 3).



**Figure 3: Rent in the mid transverse colon.**

The mesenteric rent was closed in 2 layers with repair of large serosal tears after decompressing the bowel. Since the whole large intestine was involved diversion

ileostomy was performed, peritoneal toilet given and abdomen was closed in layers. Patient had an uneventful recovery and discharged after 10 days.

## DISCUSSION

Barotrauma to the colon can be iatrogenic or follow air compressor abuse. Iatrogenic injury usually follows a colonoscopy procedure where air is insufflated into the colon.<sup>12</sup> The part of colon which sustains the injury commonly is the caecum since it is the widest part of the colon.<sup>12-15</sup>

In air compressor abuse the part of the colon mostly affected is the recto sigmoid which may be due to its fixity and restricted mobility and the angulation.<sup>16</sup> Woltjen reported a series of 3000 colonoscopy with a reported colonic injury in 4 patients.<sup>12</sup> "Cat scratch" colon is the mild type of iatrogenic barotraumas while perforation is the severe type. Hemorrhagic colitis is a remarkable histological finding in cat scratch colon.<sup>17</sup>

The inappropriate and unconscious use of air compressor usually occur when working mates are joking with each other without realizing the serious consequences like colonic perforation which can be fatal. Burt, in his study stated that the average pressure necessary to rupture the full thickness of bowel in human gastrointestinal tract is 0.29 kg/cm<sup>2</sup>.<sup>18</sup> The bowel injury depends not only on the intraluminal pressure but also on the velocity of airflow because the bowel can dilate enormously if pressure is developed slowly as in cases of intestinal obstruction.<sup>15</sup> The sudden high velocity insufflation induces extreme shear force which leads to rapid dilatation, serosal tear and perforation.<sup>16</sup>

Small perforations can be managed by primary closure with or without a diversion colostomy or ileostomy depending on the site.<sup>15,16</sup> The patient in our case had a mid-transverse colon perforation with diffuse serosal tear & minimum contamination. So, we did a primary closure and diversion ileostomy. The diagnosis of this condition is not difficult provided a proper history is elicited, when it is not possible especially in an unconscious patient or when associated with other injuries an enquiry about the profession or site of injury should be done.<sup>7</sup> Intraperitoneal free gas on chest X-ray or abdominal X-ray will confirm the diagnosis.

Management of pneumatic colon injury include rectal tube decompression, intraoperative decompression of bowel in the presence of one distended bowel, resection of severely injured segment of colon and to repair perforation with proximal diverting colostomy or enterostomy, when the integrity of the bowel is in doubt.<sup>9</sup>

## CONCLUSION

Air compressor abuse causing colonic perforation is a rare but known entity which usually follows when prank

goes wrong. It needs to be diagnosed and treated without any delay.

Enough safety precautions including educating the employees to be taken to prevent such injuries especially in industrial settings.

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