(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 5, Issue 6 , Page No: 303-307
November-December 2022

IJMSCR

# Rare Case Report Of Barotrauma Causing Colorectal Injuries

**[1]Prof. Dr. R. Rajavelu, [2]Dr. S.Manikannan, [3]Dr. K.Alex Franklin, [4]Dr. M. Kaviarasan**
[1]Ms., Frcs, [4]Ms Post Graduate, [2,3]MS

***Corresponding Author:**
**Prof. Dr. R. Rajavelu**

Type of Publication: Case Report
Conflicts of Interest: Nil

**Abstract**

**Keywords**: NIL

## Introduction

In our modern days , use and misuse of machinery has been increased. One such machinery is high pressure compressed air jet pump which was used in automobiles shop and construction buildings. Ignorance , misuse and perversion have led to ill effects of using such machines with injuries resulting from accidental and deliberate exposure of anus to high pressure air pump. High pressure injury leading to rectal blowout in battle field injuries have been reported , while apart from iatrogenic injuries , barotrauma due to compressed air causing colorectal injuries have been reported very rare in our country. Hence we present a experience on treating a case of transanal high pressure barotrauma causing colorectal injuries.

## Case report

40 year old male who was working in building construction was brought by his friends with alleged h/o having received compressed air jet pressure through anus by his friends ( put the nozzle of air pump into anus and inflated it) followed by had c/o abdomen pain with distension. h/o obstipation. on admission Pulse rate – 100/min., BP – 100/70mmhg , SpO2 – 98 at room air., Per abdomen - diffuse abdomen distension with tenderness, diffuse guarding +., tympanic note on percussion.

Per rectal examination – roomy , abrasion+., tone high.,

on x-ray erect abdomen – dilated bowel loops.,( ? tension pneumoperitoneum ) *Figure 1*

percutaneous needle decompression done to reduce tension pneumoperitoneum.

CT abdomen – pneumoperitoneum+ with dilated bowel loops. *Figure 2*

Patient was transfer to emergency OT after resuscitation and planned for emergency laparotomy and proceed.

Intraoperatively multiple serosal tears noted over rectum, sigmoid colon & distal part of descending colon *Figure 3*, toxic fluid around 50 to 70 ml was drained. Small bowel loops found to be viable but all bowel wall was found to be friable. Hence we proceeded with repair with proximal enterostomy.

Procedure done : laparotomy with serosal repair with loop colostomy of viable descending colon.

Post operatively patient improved well., mobilized on POD-2., ostomy functioning well., started orals on POD-2 Figure 4. Discharged on POD-8 and advised with follow-up.

**Figure 1 - xray erect abdomen - dilated bowel loops**

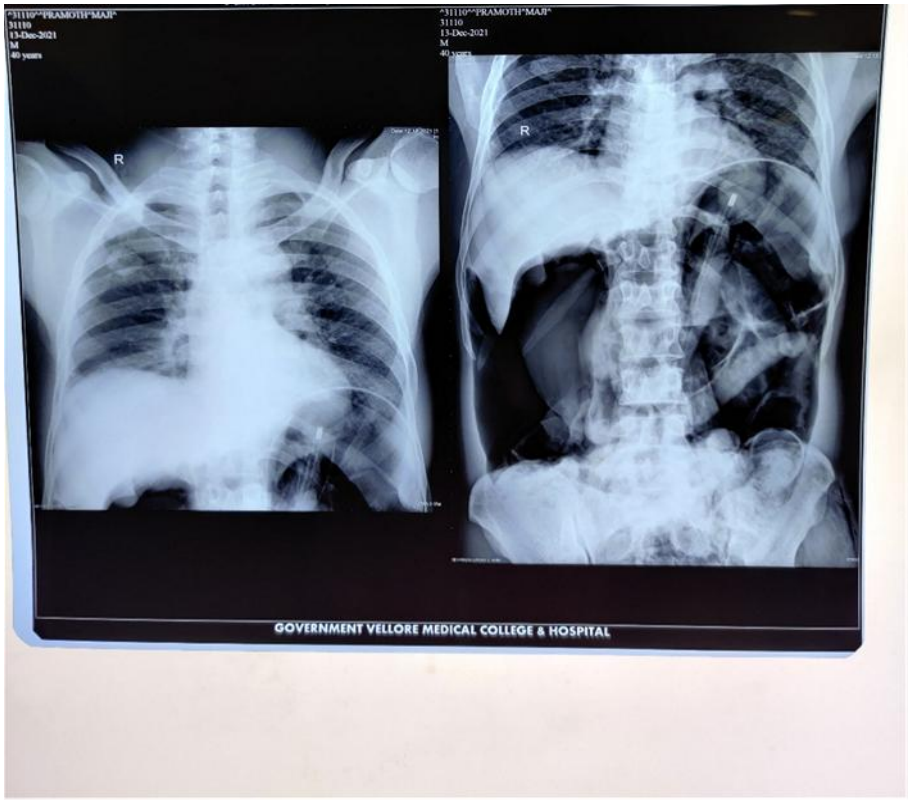
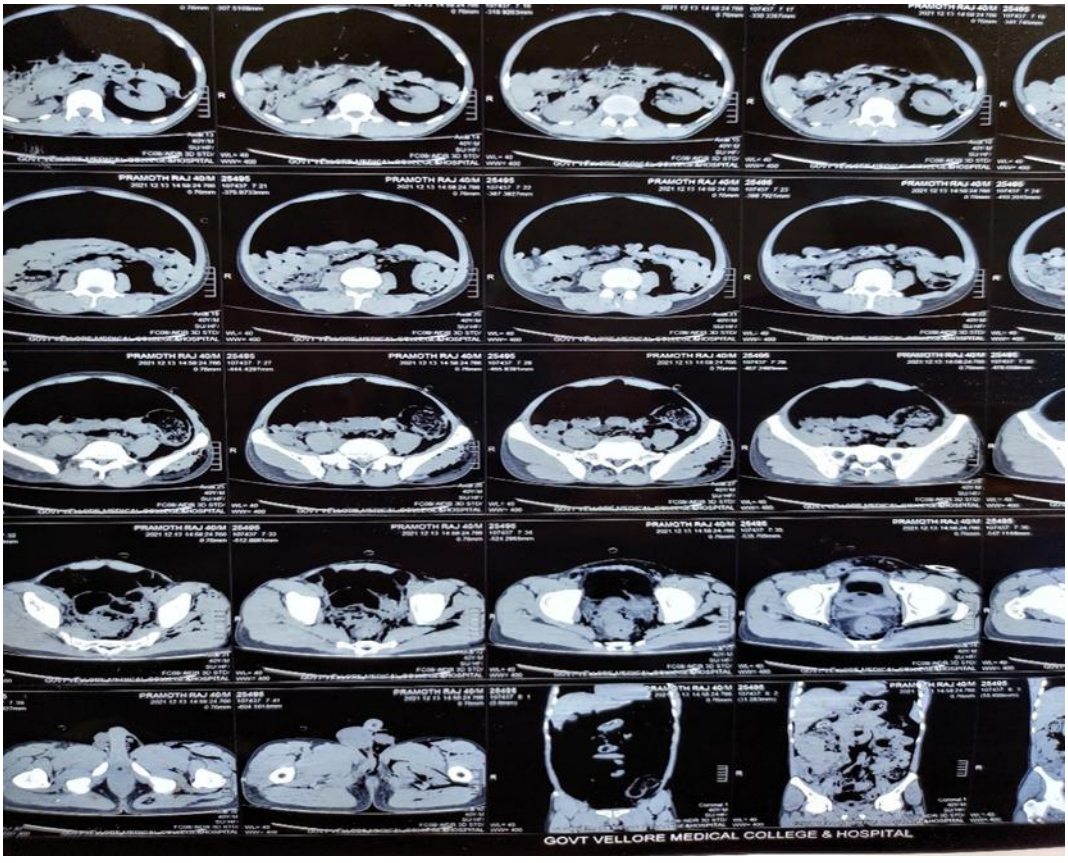



**Figure 2 ct abdomen shows dilated bowel loops with pneumoperitoneum**






Volume 5, Issue 6; November-December 2022; Page No 303-307

**Figure 3 Intra op image - multiple seromuscular tears noted in sigmoid colon and viable small bowel loops**




Volume 5, Issue 6; November-December 2022; Page No 303-307

**Figure 4 POST OP image., early mobilization is always needed**



Volume 5, Issue 6; November-December 2022; Page No 303-307

**Discussion :**

Incidence of barotrauma due to colonoscopy is 0.1 to 0.5 % . thus colorectal injury due to barotrauma was extremely rare and it is mostly reported in industrial workers.

During insufflation of colon or in large bowel obstruction distal to cecum , cecum is most commonest segment prone for distension injury ( cecum has largest diameter and requires least amount of pressure to distend )., which was well explained based on LAPLACE's LAW.

Laplace's law states that " degree of angulation (sharpness of cylinder ) is more important than intramural pressure in determined wall tension.

Anatomically , buttocks and perineum configured like a funnel, hence easily allows compressed air into anal orifice., air jet enters the anus more readily than examining finger or proctoscope as it passes through clothes and anus even which is not directed accurately. The anatomy of distal colon with firm lateral support of rectum makes the rectosigmoid junction earliest part of colon to be struck by pressure from external source and anatomical configuration of sigmoid colon and recto sigmoid junction are more prone to perforate in pressure related colon barotrauma.

Studies have been shown that Air flow in colonoscopy is around 1.46 l/min., while compressed jet air flow is around 141 l/min ., which is 100 times higher than the safer level of air flow. Industrial air jet pressure have been classified into low pressure air compressors ( discharge pressure of < 150 psi ) , medium pressure compressors ( 150 to 1000 psi ) and high pressure compressors (> 1000 psi )., mostly medium pressure compressors are used in industrials.

Anal sphincter resting pressure around 40 to 80 mmhg., seromuscular rupture occurs on 100 to 120mmhg while colon bursts on 140- 200 mmhg., compressed air jet takes 1to 2 seconds to deliver enough pressurized air to cause injury. Due to anatomical configuration and sudden nature of insult does not allow air to pass entire bowel uniformly, most commonly rectum and rectosigmoid junction has prone for perforation., this is due to rectum and anus are well supported by pelvic structures and fixity of rectosigmoid junctions. Thus injury is depends upon air pressure, air flow velocity , resting pressure and distance between the source and anus.

In case of barotrauma due to transanal high pressure , always management will be surgical only., careful observation must needed because full thickness perforation may present lately., surgeon must keep in mind that in these type of case , safefull plan will be " repair / resection with proximal enterostomy "

Due to enormous amount of air insufflation patient will be presented as tension pneumoperitoneum . it will cause fatal hemodynamic , respiratory compromise, decreased venous return to heart due to compression of inferior venacava and splanchnic circulation results in hypotensive shock , abdominal compartment syndrome and leads to death. Hence emergency intervention is needed in that type of cases. Emergency percutaneous decompression with needle or cannula will be needful.

**Conclusion**

Colorectal injuries by pneumatic insufflation through anus depends on air pressure, air flow velocity, anal resting pressure, & distance between source and anus. Relative fixity of rectum and bends of sigmoid make rectosigmoid junction more prone for rupture by high pressure air jet. Amount of injury may vary from mucosal tears to full thickness perforations . Always management ranges from repair or resection with proximal viable enterostomy in order to treat delayed presentation. Educating regarding such machines and their safe use must be encouraged because most of the cases are accidental and due to ignorance.

**REFERENCE**


1. Stone GW. Rupture of the bowel caused by compressed air. Lancet. 1904;2:216.
2. McDonnell WM, Loura F, Pointon MJ, Greenson JK. Cat scratch colon. Endoscopy. 2007;39(5):459–61.
3. Jentschura D, Raute M, Winter J, Henkel T, Kraus M, Manegold BC. Complications in endoscopy of the lower gastrointestinal tract: therapy and prognosis. Surg Endosc. 1994;8(6):672–6.
4. Tulchinsky H, Madhala-Givon O, Wasserberg N, Lelcuk S, Niv Y. Incidence and management of colonoscopic perforations: 8




Volume 5, Issue 6; November-December 2022; Page No 303-307

years' experience. World JGastroenterol. 2006;12(26):4211–3.

5. Lüning TH, Keemers-Gels ME, Barendregt WB, Tan AC, Rosman C. Colonoscopic perforations: a review of 30,366 patients. Surg Endosc. 2007;21(6):994–7.
6. Brayko CM, Kozarek RA, Sanowski RA, Howells T. Diverticular rupture during colonoscopy: fact or fancy? Dig Dis Sci. 1984;29(5):427–31.
7. Thatte M, Taralekar SV, Raghuvanshi K. Colonic barotrauma with tension pneumoperitoneum– review of literature and report of a successfully treated case. Int J Sci Res (Ahmedabad). 2014;3(4):339–41.
8. Kozarek RA, Sanowski RA. Use of pressure release valve to prevent colonic injury during colonoscopy. Gastrointest Endosc. 1980;26(4):139–42.
9. Woltjen JA. A retrospective analysis of cecal barotrauma caused by colonoscope air flow and pressure. Gastrointest Endosc. 2005;61:37–45.
10. Andrews EW. Pneumatic rupture of the intestine, a new type of industrial accident. Surg Gynecol Obstet. 1911;12:6372.



Volume 5, Issue 6; November-December 2022; Page No 303-307