



COLONIC BAROTRAUMA BY COMPRESSED AIR GOPIKRISHNAN R RAJASEKAR

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Abstract : Compressed air finds a lot of use in various industries. Workers in these varied industries also use it to dust off their clothes at the end of their shifts. One would think it is not uncommon for workers to play pranks on their fellow workers as the air hose is too tempting. But little are they informed about the serious and even fatal consequences of such pranks. A compressed air hose pointed at the anus even though not in direct contact with it can lead to serious consequences to the colon within seconds. Here we present a case of extensive barotrauma to the colon in a foundry worker who was subjected to a cruel prank by his fellow workers. The patient developed extensive seromuscular tears in the colon and a single perforation in the transverse colon which was managed surgically and the patient made a full recovery

Keyword : colonic barotrauma, compressed air, colonic perforation

Introduction:

Few cases of barotrauma to the colon have been reported in the past. Most of these cases are due to accidental or deliberate injection of compressed air through the anus, mostly in industrial workers by self or by co-workers. Here we present such a case where the patient was subjected to such a prank by his co-workers resulting in extensive sero-muscular tears of the colon and perforation of the transverse colon.

Case Report

An 18 year old worker in a foundry in an industrial area in Chennai was brought to our emergency ward in Rajiv Gandhi Government General Hospital with complaints of severe abdominal pain, abdominal distension, breathlessness for about 8 hours duration. All the symptoms had a sudden onset. On examination he was tachypnic, had tachycardia with a normal blood pressure. The abdomen was distended with diffuse guarding, tenderness and the percussion was tympanic. On further probing, it was found that he had gone to work as usual and at the end of his shift when he was dusting off his clothes, some fellow workers directed a running compressed air hose towards his anus from a distance of around 30 cm. The patient experienced a sudden severe sharp pain in his abdomen and collapsed

. The massive pneumoperitoneum in the abdominal x-ray corroborated with this history. (Fig 1)

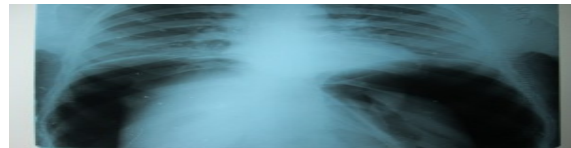


Fig 1

The patient was taken up for immediate laparotomy and on opening the abdomen, there was a gush of air. There were multiple longitudinal sero-muscular tears in the colon, from caecum to the sigmoid with the largest measuring around 15 cm in the transverse colon (Fig 2, 3, 4). In this large transverse colon tear, there was a 1*1 cm perforation (Fig 5). There was almost no contamination in the peritoneal cavity. The perforation was closed in two layers and the sero muscular tears were closed with 2.0 Vicryl intermittent stitches. A covering ileostomy was done



Fig 2

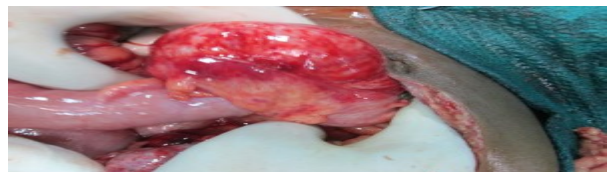


Fig 3



Fig 4

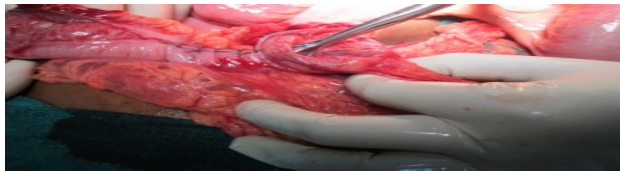


Fig 5

Oral diet was started on the third post-operative day and patient was discharged on the seventh post-operative day. Patient was reviewed 6 weeks later and a loopogram was done and found to be normal. Ileostomy was closed 6 weeks after the initial surgery and the patient made an uneventful recovery. In this patient the small bowel was spared because of a competent ileo-cecal valve. Even though there was almost no contamination in the peritoneal cavity, a diverting ileostomy was done as the sero-muscular tears were extensive.

DISCUSSION

Almost all cases of similar trauma reported in international literature were due to industrial workers playing a prank on their fellow workers. Andrews in 1911 in his famous paper described how colon is injured with increasing pressure. He used compressed air to distend the colon of dogs and oxen(1,7). He showed that the average pressure required to cause complete full thickness of the bowel was 0.29 kg/sq cm. Initially the serosa and the muscularis mucosa gives way and when the pressure increases further, the mucosa tears causing a full thickness laceration. Rectum was found to be the most resistant part of the intestines followed by the sigmoid, ileum, oesophagus, jejunum, transverse colon, caecum and lastly the stomach(7). Reviewing past case reports, the most commonly reported site of perforation is the rectosigmoid even though it is the most resistant part of the colon. This is probably because the jet of air first strikes the anterior wall of rectum and sigmoid(5). The anus and the distal rectum are well supported by surrounding tissue. There were no reports of the small intestines being injured by barotrauma. Andrews further reported that clothes did not protect in any way. Some patients may withhold information, trying to protect the guilty party or due to embarrassment. In such cases, the general symptoms are abdominal pain, abdominal distension, rectorrhagia, tachycardia, tachypnoea. Tension pneumoperitoneum is a characteristic presentation (5,6). Death can be caused by acute air embolism, acute fat embolism, acute respiratory insufficiency due to increased intra-abdominal pressure and chest compression, acute heart failure due to insufficient preload and peritoneal shock (6). Percutaneous decompression of the tension pneumoperitoneum can be accomplished by inserting a cannula or a Veress needle into the abdomen for relief of the pressure and this has been found to significantly reduce mortality.

CONCLUSION

Colonic barotraumas occurs mainly due to ignorance and negligence on part of the industrial workers. Proper education, training and creation of awareness about this sort of injury among industrial workers will go a long way in decreasing the incidence of such cases. Timely diagnosis and intervention is essential in preventing further complications like abdominal compartment syndromes, sepsis. In most cases, a clear history may not be available because of fear and shyness on part of the patient and his accompanying persons.

.The attending surgeon should be vigilant about such a colonic barotrauma when encountering a patient with massive pneumoperitoneum.

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