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Case Report

Colorectal injury by compressed air: the rule of conservative therapy

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ABSTRACT

We are reporting a case of colorectal injury caused by a jet of compressed air directed from a distance towards the anus. The patient mentioned that it happened accidentally while his colleague was cleaning his clothes using compressed air. The patient presented with acute abdominal pain and distension. A contrast CT study did not show any free air or leakage. The patient was treated conservatively, progressed well and was discharged from the hospital on the fourth day.

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Lesão colorretal por ar comprimido: a regra da terapia conservadora

Palavras-chave:
Lesão de colon por ar comprimido
Barotrauma de colon
Lesão intestinal pneumática

RESUMO

Descrevemos um caso de lesão colorretal causada por um jato de ar comprimido direcionado para o ânus, a certa distância. O paciente mencionou que o ocorrido foi acidental, enquanto um colega estava limpando suas roupas com ar comprimido. O paciente se apresentou com dores abdominais agudas e distensão. Um estudo de TC contrastado não demonstrou ar livre, nem vazamento. O paciente foi tratado conservadoramente, teve boa evolução e recebeu alta hospitalar no quarto dia.

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Introduction

Colorectal injuries due to compressed air are very rare and, of the few cases mentioned in the literature, nearly all of them underwent surgery.[1,2] Most of the reported cases were due to the deliberate insertion of an air hose into the rectum. However, in this particular scenario, the action was accidental and directed from a distance, with the compressed air being used

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to clean dust off the clothes. Due to the rarity of the method of injury and the lack of literature on the case, conservative treatment can be challenging.

Case presentation

A 27-year-old man presented to the Emergency Department complaining of abdominal pain and distension. He worked in a tyre shop and had asked a colleague to clean the clothes that he was wearing by using a jet of compressed air. While doing so, the colleague pointed the hose towards the anal region, and, although the hose itself was not placed into the anus, a jet of air blew through his clothes and into the anal opening for around one second duration. Immediately, the patient experienced abdominal distension, generalised abdominal pain and shortness of breath. He visited the bathroom, where he passed stool mixed with a few drops of fresh blood, and vomited twice.

One hour after the incident, he arrived in the Emergency Department and experienced a further episode of vomiting in the triage area. He was conscious and vitally stable, and pain on the Visual Analogue Scale (VAS) was 8/10. On examination, the abdomen was distended and hyper-tympanic on percussion, and there was tenderness and guarding in the lower abdomen. Local examination showed an abrasion at the anal verge at the 5 o'clock position. Rectal examination elicited tenderness, but no bleeding, and a proctoscopy did not show any abnormalities apart from the presence of loose stool.

The patient was given morphine and metoclopramide and had a urinary catheter inserted. Abdominal X-rays (erect and supine) showed gases and bowel distension, but no sign of free air. The laboratory tests gave a C-reactive protein (CRP) of 59 mg/dL (normal < 10 mg/dL), a white blood cell (WBC) count of 19.7×10^9 L (normal $4.0–11.0 \times 10^9$ L) and neutrophilia (84.3%). Other laboratory investigations were unremarkable. A computed tomography (CT) scan of the abdomen (with rectal contrast) showed thickening in the rectal and sigmoid wall, with air in the wall and stranding of the surrounding mesentery. There was also subcutaneous emphysema in the perianal region, as well as at root of the scrotum. The scan showed minimal free fluid collection in the sub-hepatic and right paracolic regions, with no pneumoperitonium and no contrast leakage (Figs. 1 and 2).

Upon re-assessment an hour later, the patient's pain had decreased and his abdomen was now soft, with mild tenderness still present in the left iliac fossa. A diagnosis of sealed perforation was accepted and the decision taken was to treat him conservatively. He was admitted to the hospital, kept nil per oral (NPO) with intravenous (IV) fluids and started on IV antibiotics (Tigecycline 100 mg stat dose, followed by 50 mg twice daily). He was followed up by serial physical examination.

On the second day, the abdominal pain and distension had further decreased and the abdomen was soft and non-tender, and the patient was started on a soft diet. By the third day, the patient had no abdominal pain, was passing normal stools and was tolerating a full diet. His vital signs were normal and his abdomen was soft and lax. His repeat laboratory tests showed that CRP had decreased from the initial 59 mg/dL to a new level of 40 mg/dL, and the WBC count had normalised to 9.1×10^9 L.

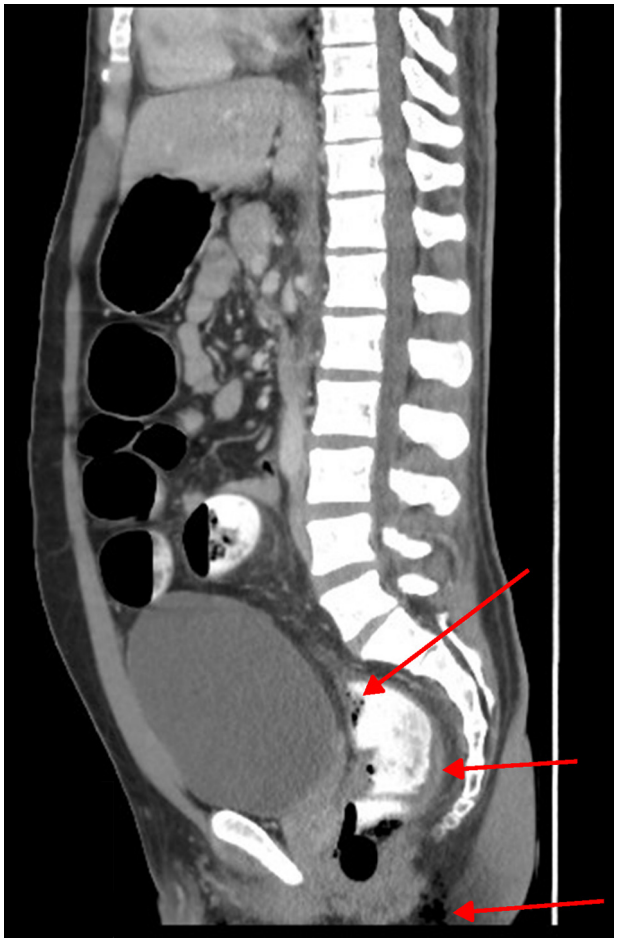

Fig. 1 – Thickness and air in the rectal wall with surrounding tissue haziness, distended bowel and subcutaneous emphysema.

On day four, he was doing well and so was discharged from the hospital with oral antibiotics (Cefuroxime 500 mg twice daily for five days). At his follow-up appointment in the clinic one week later, the patient had no complaints, had normal bowel motions and his abdomen was soft.

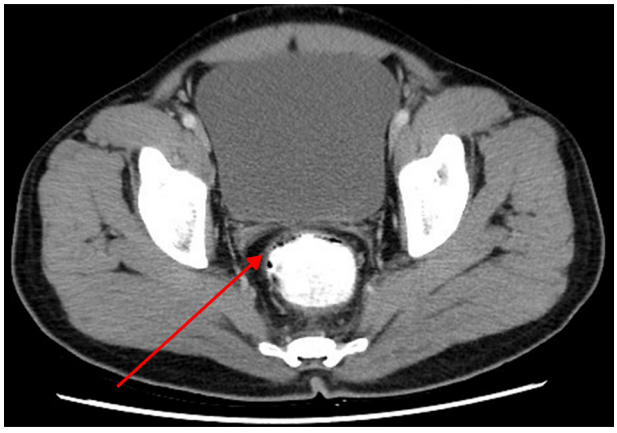

Fig. 2 – Air in rectal wall.

Discussion

The majority of cases of colorectal injury by compressed air are due to the insertion of the air hose directly into the rectum, and the first such case was reported by Stone in 1904.[3] However, there are very few cases reported in the literature whereby the injuries occurred while the air hose was held outside of the patient's clothing, at a distance from the anus.[4] In such a case, the worn clothing and the anal sphincters might become weakened due to the pressure and volume of the jet of air, and this can also cause perforation or gangrene of the bowel within a short period of time. The gangrene occurs due to over distension of the bowel, which compromises the blood supply, or embolisation of the inferior mesenteric artery.[5]

The vast majority of reported injuries are in the region of the antimesentric border of rectosigmoid. The pathologic lesions following pneumatic insufflation depend on the resultant intraluminal pressure. It can include serosal haemorrhage, lacerations of the serosa and muscular coat with bulging of the mucous membrane, or complete rupture of the bowel through the serosa, muscular coat and mucous membrane.[6] In the majority of cases, the injuries were only seromuscular lacerations. Mehmet[7] reported a case in which there were multiple serosa injuries in all segments of the colon, especially the sigmoid colon and the caecum, although there was no perforation.

External pneumatic insufflation injury of the colon through the anus depends on the amount of air pressure, the airflow velocity, the anal resting pressure and the distance between the source and anus. The jet of air can pass through the clothes and enter the bowel even when it is not accurately directed at the anus. It has been suggested that the thighs, buttocks and perineum form a funnel that help deliver the stream of air into the anus.

Conservative management is the rule for such injuries. If no perforation is identified radiologically, and the patient has no signs of peritonitis, the injury might be just seromuscular in nature and the patient can be managed conservatively. Similar to our case, quite a few other previous cases that involved pneumatic bowel injury without perforation were managed non-operatively with full recovery.[8] If perforation has occurred and is evident radiologically, but signs of general peritonism are absent and the patient's condition is good, the perforation might have been sealed. In such a case, expectant management should be adopted.[9,10]

Conclusion

Colorectal injury should be suspected in compressed air injury. The majority of cases need surgical intervention. The decision to go for conservative management should be taken cautiously and guided by the clinical situation of the patient.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available.

Conflicts of interest

The authors declare no conflicts of interest.

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