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Research Article

BURSTING THE BUBBLE: A CASE REPORT OF SIGMOID COLON PERFORATION CAUSED BY COMPRESSED AIR

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ABSTRACT

Colonic perforations are typically attributed to various medical and surgical causes, but rare instances arise from unconventional incidents. This case report presents an unusual occurrence of sigmoid colon perforation resulting from exposure to compressed air. A 45-year-old male, with no history of gastrointestinal disorders, presented with sudden onset abdominal pain and signs of peritonitis. Upon investigation, a history of accidental exposure to high-pressure compressed air while working was revealed. Subsequent imaging and exploratory laparotomy confirmed a perforation in the sigmoid colon. The patient underwent surgical repair and had an uneventful postoperative recovery. This report highlights the potential dangers associated with non-medical uses of compressed air and emphasizes the importance of a thorough patient history in diagnosing uncommon etiologies of gastrointestinal perforations.

KEYWORDS

Sigmoid colon perforation, compressed air injury, gastrointestinal perforation, peritonitis, exploratory laparotomy, abdominal pain, case report, surgical repair, uncommon etiology, patient history.

INTRODUCTION

Colonic perforation is a serious medical condition that most commonly results from underlying gastrointestinal diseases, surgical procedures, or traumatic injuries. However, there are instances where seemingly innocuous and unconventional incidents can lead to unexpected complications. This case report

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delves into an unusual presentation of sigmoid colon perforation caused by exposure to compressed air – a scenario that highlights the need for comprehensive assessment and vigilant consideration of uncommon etiologies in diagnosing gastrointestinal perforations.

Gastrointestinal perforations have diverse origins, ranging from inflammatory conditions to iatrogenic complications. The sigmoid colon, due to its anatomical location and susceptibility to mechanical stress, can be particularly prone to perforations. Common causes include diverticular disease, inflammatory bowel disease, and neoplastic processes. Yet, instances involving external factors not directly related to medical conditions remain rare and often intriguing.

In this report, we present the case of a 45-year-old male who presented with acute abdominal pain, signs of peritonitis, and no pre-existing gastrointestinal disorders. The patient reported accidental exposure to high-pressure compressed air while engaged in work-related activities. Such incidents, while atypical, underscore the potential dangers associated with the non-medical use of tools or substances that exert mechanical force on the abdomen.

By examining this case, we aim to shed light on the diagnostic challenges posed by unconventional etiologies of gastrointestinal perforation. It emphasizes the importance of a meticulous patient history, as seemingly innocuous incidents can provide crucial insights into the underlying cause of perforation. Furthermore, this report underscores the necessity of maintaining a high index of suspicion, particularly when dealing with patients who lack typical risk factors for gastrointestinal complications.

Through this case report, we hope to contribute to the broader understanding of gastrointestinal perforations by presenting a unique instance that prompts healthcare providers to consider a wide spectrum of potential causative factors. This emphasizes the need for comprehensive clinical assessments and underscores the importance of a thorough patient history in diagnosing and managing such uncommon occurrences.

METHODS

To investigate and document the rare occurrence of sigmoid colon perforation caused by compressed air, a detailed case report methodology will be employed. The objective is to provide a comprehensive understanding of the case, including the patient's medical history, clinical presentation, diagnostic procedures, treatment, and outcomes.

The study will adhere to ethical guidelines, ensuring patient confidentiality and obtaining informed consent. Ethical approval will be sought from the relevant institutional review board before initiating data collection.

The case report will begin with a thorough review of the patient's medical history, focusing on any pre-existing conditions, prior surgeries, and relevant lifestyle factors. This information will contribute to understanding potential predisposing factors that may have led to the unusual event of sigmoid colon perforation.

Clinical data will be collected through direct patient interviews, medical records, and observations. The patient's initial presentation to the healthcare facility, including symptoms, physical examination findings, and vital signs, will be documented. Diagnostic procedures such as imaging studies (e.g., CT scans, X-rays) and laboratory tests will be detailed to establish the diagnosis of sigmoid colon perforation.

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The report will provide a detailed description of the incident, outlining the circumstances surrounding the exposure to compressed air, the patient's activities at the time, and any relevant occupational or recreational factors. Special attention will be given to the mechanism by which compressed air led to sigmoid colon perforation.

The treatment approach and interventions will be documented, including surgical procedures performed to address the colon perforation. The postoperative course, complications, and the patient's response to treatment will be thoroughly discussed.

Histopathological findings from the surgical specimen will be included to provide insight into the tissue damage and potential mechanisms of injury caused by compressed air.

The case report will conclude with a discussion of the rarity of sigmoid colon perforation caused by compressed air, the potential risk factors involved, and recommendations for prevention. The existing literature on unusual colon injuries and the mechanisms of injury related to compressed air will be reviewed to contextualize the case within the broader medical landscape.

By employing this comprehensive case report methodology, the study aims to contribute valuable insights to the medical community, emphasizing the importance of awareness, prevention, and appropriate safety measures in situations involving compressed air to prevent similar occurrences in the future.

Case Presentation:

Detailed information regarding the patient's medical history, demographics, presenting symptoms, and clinical findings were collected. The circumstances surrounding the exposure to compressed air, including the type of work being performed and the duration and intensity of exposure, were documented.

Diagnostic Evaluation:

The diagnostic process involved a series of steps to determine the underlying cause of the patient's symptoms and to confirm the presence of sigmoid colon perforation. This included:

Physical Examination:

A thorough physical examination was conducted to assess the patient's general condition, vital signs, and abdominal findings indicative of peritonitis.

Laboratory Tests:

Routine blood tests, including complete blood count (CBC), electrolytes, and inflammatory markers (e.g., C-reactive protein), were performed to assess the patient's overall health status and inflammation level.

Imaging Studies:

Radiological investigations, such as abdominal X-rays and computed tomography (CT) scans, were used to visualize the abdominal cavity, identify signs of perforation, and locate the site of injury.

Surgical Intervention and Management:

The patient underwent exploratory laparotomy to directly visualize the abdominal organs and assess the extent of the perforation. Intraoperative findings, surgical techniques employed for repair, and any additional interventions were documented.

Postoperative Follow-up:

The patient's postoperative course, including recovery progress, complications, and outcomes, were closely monitored. Data on the patient's hospital stay, wound

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healing, and any required postoperative treatments were recorded.

Literature Review:

A comprehensive literature review was conducted to identify similar cases or reports of gastrointestinal perforation caused by external mechanical forces, including compressed air injuries. This step aimed to contextualize the presented case within the existing medical literature.

Ethical Considerations:

Ethical guidelines were adhered to throughout the study. Informed consent was obtained from the patient for the publication of the case report and accompanying images.

The information gathered through these methods was synthesized to create a detailed case report outlining the patient's clinical presentation, diagnostic journey, surgical intervention, and postoperative management. The report aims to provide insights into this unique case of sigmoid colon perforation caused by exposure to compressed air and contribute to the medical literature by highlighting an unusual etiology of gastrointestinal perforation.

RESULTS

The presented case involves a 45-year-old male who presented to the emergency department with sudden onset abdominal pain, accompanied by signs of peritonitis, including fever, tachycardia, and abdominal guarding. The patient reported accidental exposure to high-pressure compressed air while engaged in industrial cleaning activities. Diagnostic evaluation, including physical examination, laboratory tests, and imaging studies, revealed findings suggestive of gastrointestinal perforation. Abdominal X-ray and CT scan demonstrated free air in the peritoneal cavity, indicating perforation.

Exploratory laparotomy confirmed a perforation in the sigmoid colon, approximately 5 cm in size. The surrounding tissues showed signs of localized inflammation and peritonitis. The surgical team performed a primary repair of the perforated sigmoid colon and ensured adequate irrigation and drainage. The patient's postoperative course was uneventful, with gradual resolution of symptoms, normalizing inflammatory markers, and restoration of bowel function.

DISCUSSION

This case report highlights a rare occurrence of sigmoid colon perforation caused by exposure to high-pressure compressed air. While most cases of gastrointestinal perforation are attributed to underlying medical conditions or surgical interventions, this instance underscores the potential dangers associated with non-medical activities that involve mechanical force applied to the abdominal region. The increased intra-abdominal pressure generated by the compressed air likely contributed to the weakening and subsequent rupture of the sigmoid colon.

The rarity of such cases underscores the diagnostic challenge they pose. Physicians must maintain a high index of suspicion and conduct a comprehensive patient history, especially in cases lacking conventional risk factors for gastrointestinal perforation. Rapid and accurate diagnosis is crucial, as delayed intervention can lead to severe complications such as peritonitis, sepsis, and multiorgan failure.

CONCLUSION

The presented case serves as a reminder that gastrointestinal perforations can stem from a wide

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range of causes, including seemingly innocuous incidents. Accidental exposure to high-pressure compressed air resulted in a unique instance of sigmoid colon perforation, underscoring the importance of considering unconventional etiologies in clinical practice. This case report emphasizes the significance of thorough patient history-taking, clinical assessment, and advanced imaging techniques in diagnosing gastrointestinal perforations, especially when standard risk factors are absent.

As physicians encounter diverse cases, each with its own intricacies, the significance of sharing and documenting such instances cannot be overstated. Through this case report, we hope to contribute to the medical literature, enhance clinical awareness, and stimulate discussions about the diagnostic challenges and management strategies related to uncommon etiologies of gastrointestinal perforation.

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