ACH Med J
(2023) 3: 258-261
ISSN:2822-5872
Doi : 10.5505/achmedj.2023.68552

CASE REPORT

Silent Pneumoperitoneum in a Major Burn Earthquake Survivor: Sigmoid Diverticular Perforation.

Merve Akin[1], Tezcan Akin[2], Ayse Karabagli[1], Ahmet Cinar Yasti[3]

[1]Ankara City Hospital, Department Of General Surgery, Burn Treatment Center
[2]Ankara City Hospital, Department Of General Surgery
[3]Health Sciences University, Department Of General Surgery

Abstract

In February 2023, two major earthquakes with magnitudes of 7.6 and 7.8 occurred in Kahramanmaraş, Turkey. Major burns are traumas that involve a multisystemic organ response. Gastrointestinal complications, including stress ulcers and acute mesenteric ischemia-related conditions, are commonly seen in patients with major burns. While crush syndrome and extremity injuries are typically observed in earthquake survivors, burn cases have also been reported. However, hollow organ perforation due to blunt trauma from being trapped under the rubble is not commonly observed. In this case report, a patient who developed a scald burn during the earthquake, trapped under the rubble, and developed silent pneumoperitoneum on the 10th day after the earthquake is presented.

Article Info

Received Date: 20.07.2023
Received Date: 29.08.2023
Accepted Date: 29.08.2023

Keywords:

Eartquake, Burns, Sigmiod Diverticulit Perforation

Correspondence Address: Universiteler Mahallesi 1604 Cadde No: 9 06810 Ankara - Türkiye
Phone: +90 532 153 53 06 / **e-mail:** merveakin.2002@gmail.com

Introduction

It is a well-known fact that major burn trauma triggers multiple organ hypoperfusion and can lead to ulcerations in the upper gastrointestinal system.[1] While sigmoid colon diverticula are present in the majority of adults, only about 4% of cases manifest as diverticulitis, abscess formation, or perforation.[2] Perforation of hollow organs is not commonly seen in blunt abdominal trauma cases.[3] This study presents a case of a patient who experienced a 15% total body surface area (TBSA) burn due to hot water spillage during the 2023 earthquake in Maraş, Turkey. The patient was rescued from the rubble after 25 hours and subsequently developed sigmoid diverticular perforation on the 14th day of treatment for the burn center.

Case

A 46-year-old female patient was rescued from the rubble approximately 25 hours after the 7.6 magnitude earthquake that occurred in Maraş, Turkey on February 6th. The patient suffered a 15% total body surface area (TBSA) third-degree burn, with 8% of the burn affecting the abdomen, as a result of hot water spillage during the earthquake. The patient was referred to our clinic on the 4th day after the trauma because of burns. Physical examination and radiological evaluations revealed no signs related to being trapped under the rubble. Fluid resuscitation was administered as maintenance treatment. Burn dressing was performed using silver sulfadiazine, and on the 3rd day of hospitalization, escharectomy was performed. On the 6th day of hospitalization, the patient developed elevated acute phase reactants, oliguria unresponsive to fluid replacement, and hypotension, suggesting sepsis. The patient was consulted with the infectious diseases department and started on antibiotic treatment. On the 10th day after the trauma, the patient complained of respiratory distress, and a chest X-ray revealed free air under the diaphragm (Figure 1). Contrast-enhanced abdominal CT scan showed perforation at the level of the sigmoid colon (Figure 2). Emergency laparotomy was performed, revealing diverticular perforation in the sigmoid colon (Figure 3). The abdomen was significantly contaminated. Sigmoid resection and end colostomy were performed. In the postoperative period, the patient required mechanical ventilator support and was extubated on the 4th day after the operation. 24 hours after extubation, the patient exhibited orientation and consciousness disturbances. On the 18th day of burn trauma and the 6th day of end colostomy, the patient underwent surgery for escharotomy and burn surgery. During the operation, a discharge was observed from the midline incision made for the laparotomy. Intraoperative assessment revealed evisceration. The patient died from intraabdominal sepsis on the 21st day following the trauma, which was the third day after the evisceration was discovered.

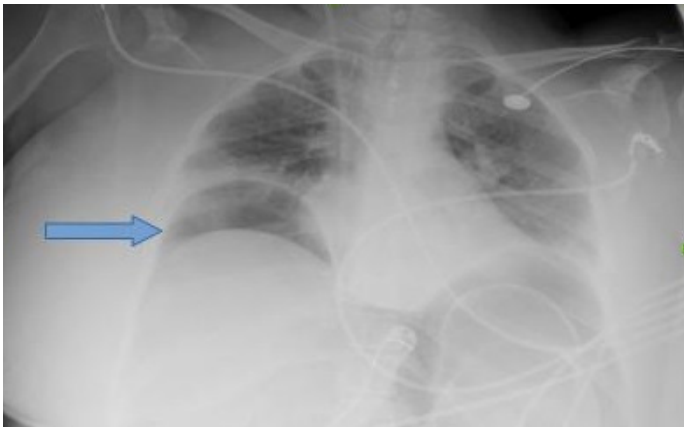

Figure 1

Figure 2

Figure 3

Discussion

On February 6, 2023, two earthquakes occurred in Maraş, Turkey, with magnitudes of 7.6 and 7.8, respectively, with an interval of 11 hours. These earthquakes resulted in the loss of over 50,000 lives. Many people were trapped under the rubble. Crush syndrome, blunt traumas, and extremity traumas were frequently encountered in earthquake victims who were rescued from the rubble. However, it was observed that hot liquid and contact burns also developed.

The patient in this case presentation had developed a 15% TBSA burn as a result of hot water spillage during the earthquake. On the 4th day after the earthquake, the patient was referred to our clinic due to the burn. Upon admission to our clinic, there were no additional injuries apart from the burn, despite being trapped under the rubble for 25 hours.

Full-thickness burns more than10% of the total body surface area are defined as major burns, which requries resuscitation.[4] The metabolic response to major burns is multisystemic.[4] In major burns, deaths due to burn shock occur within the first 72 hours, while deaths occure in the following weeks are often attributed to sepsis and multiorgan failure.[5]

Sigmoid diverticulosis is generally an asymptomatic condition. Rarely, pain in the lower left quadrant of the abdomen and an acute abdominal presentation may occur due to peritonitis. Diverticular perforation is the most serious and life-threatening complication of this disease.[6] When perforation occurs, symptoms such as fever, severe abdominal pain, and nausea are observed. However, in rare cases, silent pneumoperitoneum may develop, especially in older individuals, those using corticosteroids, or those using non-steroidal anti-inflammatory drugs (NSAIDs).[6] The presented patient has no history of using corticosteroids or NSAIDs.

Constipation, ileus, bleeding, pancreatitis, and ischemic bowel syndrome are some of the known gastrointestinal complications in burns patients.[7] Burns that cause stress gastroduodenal ulceration (Curling's ulcer) and perforation are well documented in the literature and are associated with significant morbidity and mortality.[7] Colonic ulcers and perforation appear to be uncommon in burns patients.[8,9]

In a review conducted by Fadel et al. in 2021, 9 studies reported colonic perforation at different levels.[7] Of those perforations four of them were sigmoid perforation. Three of them were reported by Cirodde et al in 2012 and all were diverticular perforation due to bowel obstruction which is well defined gastrointestinal complicaton of major burns.[1] The fourth sigmoid perforation is reported by Scaife et al which the perforation was due to intestinal obstruction associated with enteral feeding.[10]

The presented case in this study is, to the best of our knowledge, the fourth burn patient with sigmoid diverticular perforation reported in the literature. In this patient, silent pneumoperitoneum developed, and its etiology does not resemble the described known causes. The presented patient has not been entubated. Until the emergency laparotomy she was counsios and she had not any complaints or findings suggestive of intestinal obstruction or acute abdomen. Although the wounds were start to heal, all acute phase reactants were still elevated beside she presented oliguria unresponsive to fluid replacement, and hypotension. Patient had also respiratuary distress. Since the patient did not have any abdominal findings, GIS perforation might not have come to mind if free air under diaphragm was not seen in the chest X-ray. According to the peroperative findings, it was thougth that the perforation occured approximately 72 hours ago which corresponds to the time when acute phase reactants begins to elevated and renal function begins to decline.

Conclusion

Gastrointestinal complications are frequently observed in major burns and significantly impact morbidity and mortality.[7] While sepsis related to the burn is typically the first consideration in patients with resistant oliguria and/or anuria despite adequate and appropriate resuscitation, silent pneumoperitoneum should also be considered among the diagnoses in patients who show no improvement in acute phase reactants and lack sufficient urinary output despite appropriate antibiotic therapy.

References

1. Cirodde , A., Jault , P., Leclerc, T., Donat, N., & Bargues, L.et al. (2012). Sigmoid diverticulitis perforation in burns: case reports and review of the literature. Annals of burns and fire disasters, 25(1), 22–25.
2. Kanamalla , K., Salamone , F. J., & Vargas, J. (2021). Perforated sigmoid colon in the setting of chicken bone ingestion and diverticulitis: A case report. Annals of medicine and surgery (2012), 68, 102650. https://doi.org/10.1016/j.amsu.2021.102650
3. Akhgar, A., Talebian, M. T., Ashouri, M., Ghorbani, S., & Mirfazaelian, Het al. (2017). Jejunal Perforation Following Blunt Abdominal Trauma; a Case Report. Advanced journal of emergency medicine, 1(1), e9. https://doi.org/10.22114/AJEM.v1i1.22
4. Ronald P. Mlcak, Michael C. Buffalo, and Carlos J. Jımenez, Prehospital Management, Transportation, and Emergency Care. Total Burn Care by D. Herndon, 5 th edition Elsevier, 2018
5.Wurzer P, Culnan D, Cancio LC, et.al. Pathophysiology of Burn scock and burn edema; Total Burn Careby D. Herndon, 5 th edition ; Elesivier, 2018
6. Bashar, S., Al Sbihi, A. F., Manasrah, N., Chaudhary, A. J., & Iqbal, S.et al. (2021). Silent Sigmoid Colon Diverticular Perforation: A Case Report. Cureus, 13(5), e14900. https://doi.org/10.7759/cureus.14900
7. Fadel, M. G., Iskandarani, M., Cuddihy, J., Jones, I., Collins, D., & Kontovounisios, Cet al. (2021). Colonic perforation following major burns: Experience from a burns center and a systematic review. Burns : journal of the International Society for Burn Injuries, 47(6), 1241–1251. https://doi.org/10.1016/j.burns.2021.04.018
8. Ghoneim, I. E., & Bang, R. L. (1995). Caecal perforation in a burn patient. Burns : journal of the International Society for Burn Injuries, 21(8), 619–621. https://doi.org/10.1016/0305-4179(95)00043-b
9. Still, J. M., Jr, Scheirer, R. C., & Law, E. J. (1994). Caecal perforation due to colonic ulcer in a burn patient. Burns : journal of the International Society for Burn Injuries, 20(1), 85–86. https://doi.org/10.1016/0305-4179(94)90116-3
910. Schnider, S. L., Shank, C., Henry, S. E., & Bingham, H. G. (1985). Perforation of the transverse colon in a patient with a major thermal injury. The Journal of burn care & rehabilitation, 6(3), 243–245. https://doi.org/10.1097/00004630-198505000-00008
10. Scaife C., Saffle JR, Morris SE. (1999). Intestinal obstruction secondary to enteral feedings in burn trauma patients. The Journal of trauma, 47(5), 859–863. https://doi.org/10.1097/00005373-199911000-00007