Annals of Surgical Case Reports

Case Report
Published: 24 Jun, 2020

# Management of Penetrating Injury to Multiple Body Cavities Following Trans-Rectal Impalement of Foreign Body: A Case Report

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## Abstract

Penetrating trauma injury by rectal impalement is a rare form of injury, complicated and potentially lethal. It is even rare for such injury to result in pelvic, abdominal and thoracic cavities injuries. The true incidence of anorectal foreign body is underreported but is increasing. It is a challenging clinical problem in the emergency department and surgical wards, and it is more prevalent in males. We present a case of 50-year-old male who reportedly slipped in bathtub and fell on his right chest wall. Radiographic examination revealed a slender mass extending from his rectum to the right side of his neck. A review of literature reveals rare case reports describing the management of such impalement injury traversing the pelvic, abdominal, and thoracic cavities. The case report was approved by Helsinki Committee at Rambam Health Centre.

**Keywords: Injury; Trauma; Blood pressure; Laparotomy; CT scan**

## Case Report

We report a case of 50-year-old male that was admitted to our Emergency Department at a level I Trauma center, claiming that he slipped in the bathtub and injured his right chest wall [1-3]. On admission his blood pressure and pulse were normal and saturation was 92% in room air. On physical examination a decreased breath sounds on the right side of the chest was noticed along with extensive subcutaneous emphysema on the right chest and neck. Chest X-ray revealed small pneumothorax on the right side (Figure 1). Due to those findings a chest tube was inserted to his right chest and revealed small amount of air (Figure 2). On his total body CT scan a foreign tubular structure was demonstrated in the right side of the body perforating proximal part of sigmoid colon, retroperitoneum, liver, right diaphragm, lung and reaching to the right clavicle. The CT scan also revealed free intraperitoneal air and fluid, right pneumothorax, pneumomediastinum, and extensive subcutaneous emphysema (Figure 3 and 4). The patient was incubated and transferred to the operative theatre for exploratory laparotomy. On laparotomy, a small amount of blood in the peritoneal cavity was detected, a broomstick perforating the recto-sigmoid junction causing 3rd degree colon laceration [4-6], penetrating through the retroperitoneum sliding along the IVC impaled into the liver and penetrating to the right chest through the right diaphragm. During surgery we decided to open the right chest for better exploration and control. After having control on the upper edge of the stick through right thoracotomy, we managed to pull out the


**Figure 1:** Chest X-ray on admission.

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**Received Date**: *21 May 2020*
**Accepted Date:** *20 Jun 2020*
**Published Date:** *24 Jun 2020*

***Citation:***
*Manassa E, Kluger Y, Bahouth H. Management of Penetrating Injury to Multiple Body Cavities Following Trans-Rectal Impalement of Foreign Body: A Case Report. Ann Surg Case Rep. 2020; 3(2): 1030.*

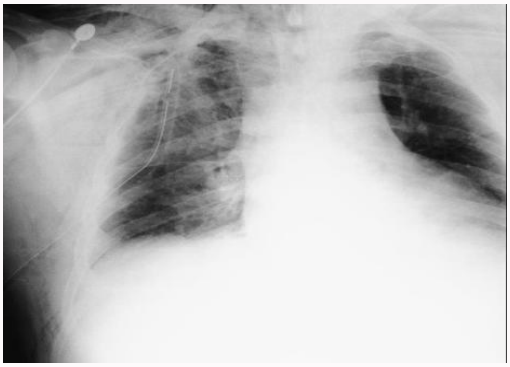

**Figure 2:** Chest X-ray after inserting a right chest tube.

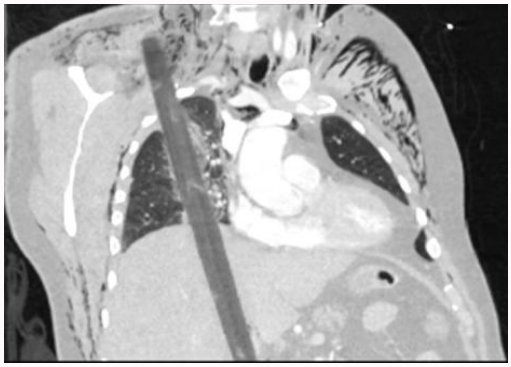

**Figure 3:** Tubular structure into the right side of the body.

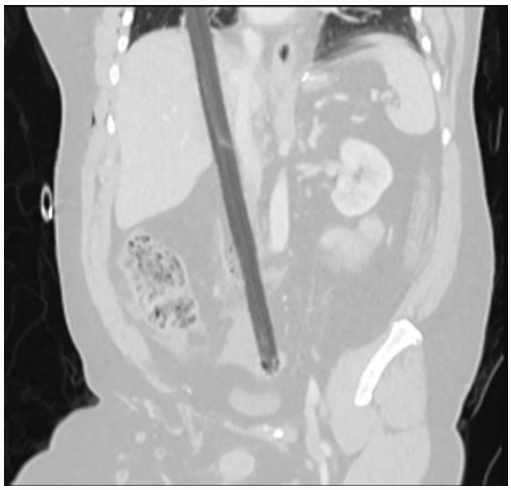

**Figure 4:** Tubular structure into the right side of the body.

stick from the liver and prophylactically inserting a Blakemore tube through the hollow defect in the liver and inflating it while its edge is outside the abdominal wall (Figures 5-8) [7]. We then resected the perforated part of the sigmoid colon, closed the right diaphragmatic injury, closed the right chest wall after leaving two chest drains and temporarily closing the abdominal wall while planning a second look laparotomy. The patient was transferred to the surgical intensive care unit. On post-operative day 2, while the patient is hemodynamically stable, a CTA of the abdomen was performed immediately after deflating the Blackmore tube revealing no active bleeding in the liver. A second look laparotomy was done on the same day when the

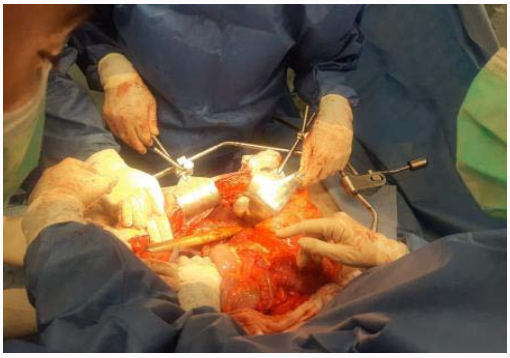

**Figure 5:** Wooden stick penetrating the liver.

**Figure 6:** The stick was cut close to its entrance point to the liver.

**Figure 7:** Blackmore tube was inserted in the defect.

Blackmore tube was removed, colostomy was fashioned through the left abdominal wall and the abdominal wall was closed primarily. In the post-operative period the patient was hemodynamically stable. Prolonged mechanical ventilation was needed due to respiratory infection which he was weaned off successfully. He was given enteral diet and discharged for rehabilitation after 72 days with a temporary colostomy.

**Figure 8:** The stick after removal from the abdominal cavity.

## Discussion

Trans-anal foreign body injuries are most often caused by a myriad of sex related activities which can be quite severe and have even been lethal [8]. Unfortunately, patients who sustain such sex related anorectal injuries often delay seeking medical attention and deny the circumstances surrounding the injury [9]. The vast majority of diaphragmatic injuries are due to penetrating trauma and they are managed tans-abdominally. In our case we also approached the repair of the diaphragmatic injury through the abdomen. The diaphragmatic repair was performed after removal of the foreign body in thought of easy access to the posterior-anterior parts of the liver in case of massive liver bleeding. Right thoracotomy was performed to control any exsanguinations hemorrhage in case of major thoracic vascular injury that could occur upon removing the foreign body, and also for evaluating the extent of injuries sustained in the right lung. There are currently no clear guidelines for the operative management of extensive impalement injuries involving multiple body cavities, and the reason for that is the rarity of cases.

Our operative approach for colon injury was based on the AAST grading system and recommendations for penetrating colon injuries. The approach to the liver injury was the same approach for penetrating liver injury, however taking into consideration other injuries and the possibility of chest hemorrhage at the time of the foreign body removal.

## Conclusion

Sustaining such a rare life-threatening complicated injury needs very careful and studious clinical and surgical approach. The intra abdominal colon injury was treated based on the AAST grading system and management. The liver injury treated as penetrating liver injury with extra caution using the Blackmore tube to control liver bleeding. The diaphragmatic injury managed through the abdomen is well accepted approach. In such rare cases we might need to think outside the box taking into consideration all the possible injuries based on CT scan focusing on threatening situations, especially exsanguinations hemorrhage from the injured organs. Using CT scan in our case had a paramount importance in guiding our clinical and operative management; this was considered due to the patient's stable hemodynamic status. Furthermore, we highly recommend using CT scan if the hemodynamic status of the patient allows it in order to gain as much information as we can to plan our surgical management. The current status of the patient shows that our decision making and management were carefully chosen with positive results.

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