CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 7 (2015) 157–160

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

A rare case of chronic traumatic diaphragmatic hernia requiring complex abdominal wall reconstruction

Andrea Pakula[a,*], Amber Jones[a], Javed Syed[b], Ruby Skinner[a]

[a] Trauma Surgery, Critical Care, Acute Care General Surgery, Kern Medical Center, 1700 Mt. Vernon Ave. Bakersfield, CA 93306, USA
[b] Radiology, Kern Medical Center, 1700 Mt. Vernon Ave. Bakersfield, CA 93306, USA

ARTICLE INFO

Article history:
Received 5 January 2015
Received in revised form 13 January 2015
Accepted 13 January 2015
Available online 15 January 2015

Keywords:
Diaphragm hernia
Traumatic hernia
Hernia repair
Mesh

ABSTRACT

INTRODUCTION: Traumatic diaphragmatic hernia is a rare and often under recognized complication of penetrating and blunt trauma. These injuries are often missed or there is a delay in diagnosis which can lead to enlargement of the defect and the development of abdominal or respiratory symptoms.
PRESENTATION OF CASE: We report a case of an otherwise healthy 37 year old male who was involved in a motor vehicle accident at age twelve. He presented 25 years later with vague lower abdominal symptoms and was found to have a large chronic left sided diaphragmatic hernia involving the majority of his intra-abdominal contents. Repair of the defect with a biologic mesh was undertaken and the patient also required complex abdominal wall reconstruction due to loss of intra-abdominal domain from the chronicity of the hernia. A staged closure of the abdomen was performed first with placement of a Wittmann patch. Medical management of intra-abdominal hypertension was successful and the midline fascia was sequentially approximated at the bedside for three days. The final closure was performed with a component separation and implantation of a fenestrated biologic fetal bovine mesh to reinforce the closure. In addition, a lightweight Ultrapro mesh was placed for additional lateral reinforcement. The patient recovered well and was discharged home.
DISCUSSION: These injuries are rare and diagnosis is challenging. Mechanism and CT scan characteristics can aid clinicians.
CONCLUSION: Blunt diaphragmatic injury is rare and remains a diagnostic challenge. Depending on the chronicity of the injury, repair may require complex surgical decision making.

1. Introduction

Traumatic diaphragmatic hernia is a rare and often under recognized complication of penetrating and blunt trauma [1]. These injuries are often missed or there is a delay in diagnosis, which can lead to enlargement of the defect and the development of abdominal or respiratory symptoms [2,3]. We report a case of an otherwise healthy 37 year old male who was involved in a motor vehicle accident at age twelve. He presented 25 years later to us with vague lower abdominal symptoms and was found to have a large chronic left sided diaphragmatic hernia involving the majority of his intra-abdominal contents. Repair of the defect was undertaken and the patient also required complex abdominal wall reconstruction as a result. Blunt diaphragmatic injury is rare and remains a diagnostic challenge. Clinicians must have a high index of suspicion if patients have certain characteristics.

2. Presentation of case

A 37 year old man presented to our emergency department with complaints of lower left sided abdominal pain. He is an otherwise healthy man with no past medical or surgical history. He stated the pain started one day prior but he denied any nausea, vomiting, shortness of breath or fever. He is a field worker and denied any respiratory or abdominal symptoms in the past. After further questioning he did recall a motor vehicle accident when he was twelve years old, twenty-five years earlier. His vital signs on presentation were as follows: blood pressure 140/86 mmHg, heart rate 102 beats/min, respiratory rate 22 breaths/min, and oxygen saturation of 96% on room air. Laboratory findings were significant for white blood cell count 18.8. A chest X-ray followed by CT scan of the chest, abdomen and pelvis were performed which demonstrated a left sided diaphragmatic hernia with stomach, pancreas, omentum, colon, and small bowel within the left hemithorax (Fig. 1). Also noted were three left sided healed rib fractures. He was admitted to the surgical service and was taken for exploratory laparotomy which revealed a 7 cm × 10 cm defect in the left diaphragm. The hernia defect was located in the medial

* Corresponding author. Tel.: +1 909 224-9848.
E-mail address: APakula333@aol.com (A. Pakula).

http://dx.doi.org/10.1016/j.ijscr.2015.01.023

Fig. 1. Preoperative chest X-ray and CT scan.

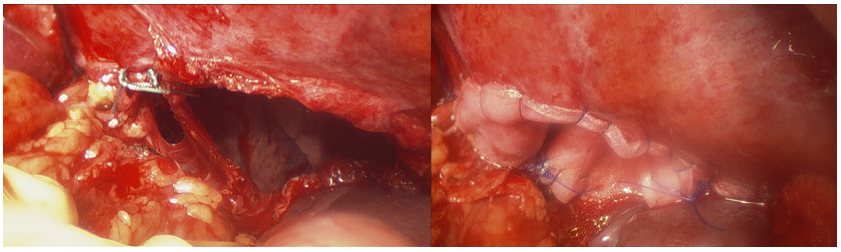

Fig. 2. Diaphragm defect before and after repair.

portion of the diaphragm abutting the GE junction. Though the majority of the intra-abdominal contents were within the chest, the GE junction remained in its usual anatomic location. Due to the size of the defect we were unable to perform a primary repair and elected to use a fetal bovine dermal biologic mesh after the reduction of contents (Fig. 2). We performed a staged abdominal wall reconstruction as the chronicity of the hernia led to loss of intra-abdominal domain. After reduction of the intrathoracic contents we were unable to primarily close the midline fascia. A Wittmann Patch was placed for serial advancement of the fascia and he was returned to the operating room for bilateral component separation, closure and reinforcement with biologic mesh (Figs. 3 and 4). Postoperatively he did have evidence of intra-abdominal hypertension and poor compliance of the abdominal wall due to loss of domain. He required prolonged mechanical ventilator support with sedation and neuromuscular blockade. He developed mild acute kidney injury which resolved and was nutritionally supported with parenteral nutrition due to distension and ileus. Ultimately he recovered well from the abdominal portion of the surgery but developed bronchiolitis obliterans organizing pneumonia (BOOP) of the left lung requiring a course of steroids.

3. Discussion

Traumatic diaphragmatic hernia is an underappreciated injury in the acute setting and the majority of published literature is individual reported cases. Trauma accounts for approximately 0.8–8% of all diaphragmatic hernias [1]. These injuries are often missed or there is a delay in diagnosis because they are associated with other injuries, which require immediate attention; or the patient does not present with typical symptoms. If an injury goes undiagnosed, the hernia can grow in size over time but will often lead to the development of respiratory or abdominal symptoms [2–4]. As in our case, diagnosis of blunt diaphragmatic rupture can be challenging if it is initially small and the patient does not require laparotomy for an associated injury. Left sided tears are most common, as the liver tends to protect the right hemidiaphragm. The most common reported mechanism of injury is motor vehicle collisions, accounting for approximately 88% of blunt diaphragmatic injuries [5–9]. Tears in the diaphragm are usually more than ten centimeters in length, are radially orientated and occur at the weakest part of the diaphragm, the musculotendinous junction in a

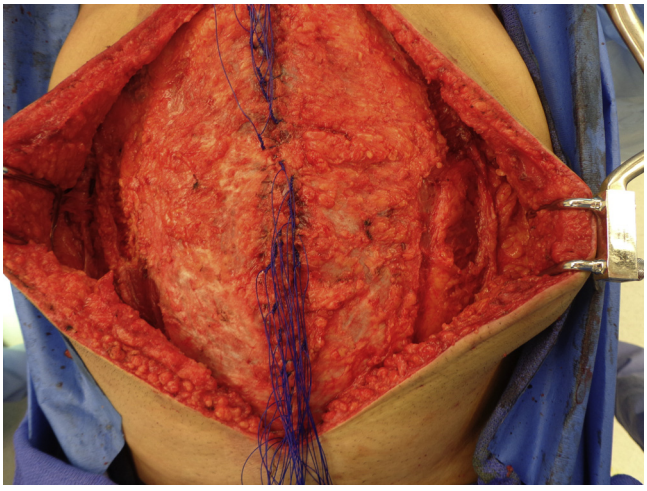

Fig. 3. Component separation and fascial closure.