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Acute and Chronic Traumatic Diaphramatic Hernia-A Therapeutic Laproscopic Approach

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I. Introduction

Sennertus[1] was the first to describe a posttraumatic herniation of the stomach in 1541. Both blunt and penetrating injuries can cause diaphragmatic injuries.

Diaphragmatic ruptures can occur in up to 0.8% to 7% of blunt abdominal trauma, with large left-sided defects being the most common.[5-8]If the injury is not recognized, progressive herniation of abdominal contents may ensue. It is estimated that approximately 40% to 62% of ruptured diaphragms are missed during the acute hospital stay.[5] Time delay of presentation has been reported to be from several weeks to 50 years.[7] however, as a missed TDI may result in grave sequelae due to herniation and strangulation of displaced intra-abdominal organs as well as respiratory compromise.

Establishing the clinical diagnosis of traumatic diaphragmatic injury (TDI) can be challenging for the emergency department or the trauma surgeon or for both, as these injuries are often clinically occult.

Conventionally, laparotomy is indicated in all patients with other associated injuries in the acute setting. However, when the diagnosis is missed during early post trauma period, thoracotomy and repair were recommended. In this present era of minimally invasive surgery, laparoscopy is a useful means to treat diaphragmatic rupture even during the acute phase.[9,10]Here, we report a case with acute and other with delayed large left diaphragmatic hernia that was repaired with a combination of thoracoscopy and thoracotomy approach respectively.

II. Case Report –Acute Diaphragmatic Injury:

A victim aged 36 years was hit by oncoming vehicle while he was changing the wheel of his parked car and sustained grievous injury to the chest by the wheel wrench. he was given primary treatment in the local centre and shifted to our centre. In the emergency room, the trauma protocol was followed and on primary survey the was conscious, oriented with stable blood pressure(140/80), but the patient was tachypneic(30RR/min), was having tachycardia(120 beats/min) with subcutaneous emphysema(figure 1) and falling saturation even with high flow oxygen therapy(15L/min). Chest X-ray was done which showed pneumothorax(figure 1) and had multiple rib fractures(figure 2). Immediate decision was taken to put the chest tube in 5th intercostal space(standard ICS), about 500ml of blood was drained. The patient was stabilised and shifted to ICU for close monitoring.

On secondary survey (detailed head to toe examination) the patient was found to have diaphragmatic hernia on left side and fracture of medial malleolus of the right lower limb. The CECT of the chest confirmed the diaphragmatic hernia with multiple rib fractures (4-11) on the left side and associated splenic laceration though the injured part had good dye uptake on contract study(figure 2 and 3). After obtaining consent, decision was taken for surgical repair, the team of doctors had various options like thoracotomy, thoracoscopy, laparoscopy and laparotomy approaches. The decision was taken to perform thoracoscopic approach as it was an acute injury.

The patient was put in right lateral position(figure 4), Single lung ventilation anaesthesia was given. Pneumoperitoneumwas created,ports were made in 6th(camera port), 8th and 10th (working ports) intercostal spaces.

The thoracoscope was introduced and the stomach, spleen contents were found, adhesiolysis of soft adhesions were done with the help of suction catheter tip and the hernia contents were reduced back into abdomen through the defect and the primary repair of the defect was done using polypropylene no1 suture in continuous suture manner from lateral to medial. Chest tubes were placed, one at base and apex of lung. Diagnostic laparoscopy was done to look for bowel injury and any other associated injuries which was found to

be negative.Post-operatively, elective extubation was done after 48 hours chest tube was removed on day 13 and orthopaedic team had decided to correct the malleolar fracture by k-wire.

The patient was discharged on day 21 and follow up x ray showed absolutely normal x-ray except for rib fractures(figure 5 and 6)

III. Case Report –Chronic Diaphragmatic Injury:

A victim aged 30 years met with road traffic accident 10 months back and sustained severe head injury for which he was treated conservatively in a private hospital. He was also diagnosed to have left diaphragmatic injury on detailed head to toe examination(figure 7 and 8), but the diaphragmatic hernia was not attended as it was asymptomatic and also his general condition was poor with poor GCS. With time his GCS improved to 10/15 and has come on routine checkup. He was found to be tachyopneic and oxygen saturation of 80% on room air. The patient was admitted for monitoring and planned for repair of diaphragmatic hernia repair as there was complete collapse of left lung with herniation of bowel, stomach into left thorax. After obtaining informed consent, the team of surgeons preferred to operate by thoracotomy approach.

The patient was put in right lateral position and thoracotomy (figure 9 and 10)was done under single lung ventilation anaesthesia. The hernia contents of stomach, small and large bowel were found in left chest(figure 11). To our surprise only few adhesions were found along with collapsed lung. The contents were reduced and primary repair was done with polypropylene suture no 1 (it was a tension free repair). Lung ventilation was done and found that most of the lung re expanded to full volume. Chest tubes were put in thorax and the thoracotomy incision was sutured in layers.

Post operatively patient was extubated after 48 hours, but developed secondary chest infection due to pooling of secretions as the patient is not able to perform chest exercises, so tracheostomy was done which was removed electively after 1 month. Post-operative x-ray showed fully expanded lung. The patient was discharged on day 15 after resolution of chest infection.

IV. Discussion

Sennertus[1] was the first to describe a posttraumatic herniation of the stomach in 1541. Both blunt and penetrating injuries can cause diaphragmatic injuries. First repaired by Riolfi in 1886[2].First large series was published in 1951 by carter.Similarly, in 1579 Ambrose Paré[3] described 2 patients who died of strangulated intra-abdominal organ through diaphragmatic defects.Petit was the first to identify and describe the differences between acquired and congenital diaphragmatic hernias.[4]

Acute diaphragmatic rupture is being recognized more frequently, with a reported incidence of 0.8%–7% in association with blunt trauma and 10%–15% in association with penetrating trauma.[11,12]The diagnosis of diaphragmatic injuries is challenging andrequires a high index of clinical suspicion. Diaphragmatic injuriesshould be diagnosed before the complications like diaphragmatichernia and strangulation occur. The mortality and morbidityincreases after the herniation and strangulation of the abdominalviscera in the thoracic cavity5.Dyspnea and chest pain was the most common presentingcomplaint. The most common presenting symptom described isdyspnea.

TDIs can result from blunt and penetrating trauma, and they less commonly can be iatrogenic. The mechanism of injury (MOI) plays a significant role in the probability of a patient having suffered a TDI; therefore, the physician treatingtrauma victim should inquire about the specifics of the MOI to minimize the chance of missing a potential TDI.

Missed diagnosis on initial evaluation is reported to be the most common cause of delayed diagnosis.The most common cause of delayed diagnosis was right sided diaphragmatic rupture (50%), thought to be because of liver which prevents the hernia. Few studies show that more incidence on left side because of more mortality rate on right sided injury prior to hospital admission because of associated hepatic injury.Despite its limitations chest x-ray still plays a major role in the diagnosis of diaphragmatic injuries. CT is reported to have a sensitivity of 71% (78% left and 50% right) and a specificity of 100% and an accuracy of 88% for left and 70% for right sided injuries.[13,14] In the diagnosis of right sided ruptures the use of MRI has also been reported.VATS and visual inspection of the diaphragm have been described for the diagnosis of diaphragmatic injuries in hemodynamically stable patients. Rubikas et al has reported associated injuries to be present in 86–88% of the cases. Fracture of the chest wall bones was reported to be the most common injury followed by intra-abdominal injuries.1Although minimally invasive techniques have been utilized in the surgical repair of both acute diaphragmatic lacerations and chronic traumatic diaphragmatic hernias, its use has not been well defined or universally accepted

Both thoracoscopic and laparoscopic approaches have been described in the repair of diaphragmatic hernias.[15-17]The advantages of these repairs over open surgery include minimal trauma, earlier recovery, and decreased hospital stay. While laparoscopy allows for betterreduction of hernia contents and evaluation of both hemidiaphragms, thoracoscopy only allows for inspection of one hemidiaphragm at a time. Ideally, repair of the

defect is performed primarily with horizontal mattress nonabsorbable suture. In the case of larger defects, prosthetic mesh may be needed.[18]

V. Conclusion

A knowledge of diaphragmatic hernia is essential for both the physician and the surgeon in atypical abdominal and respiratory discomfort, especially when there is history oftrauma. Some patients may be asymptomatic during the initial period after trauma. Inspite of all the different imaging modalities available today X-ray chest is still very useful in the diagnosis of diaphragmatic ruptures. Right sided ruptures are easily missed on chest X-ray and hence CT scan and even MRI can be considered in patients with suspected right sided ruptures.This hernia is amenable to correction by minimal access surgery and requires a prompt diagnosis aided by a high index of suspicion.

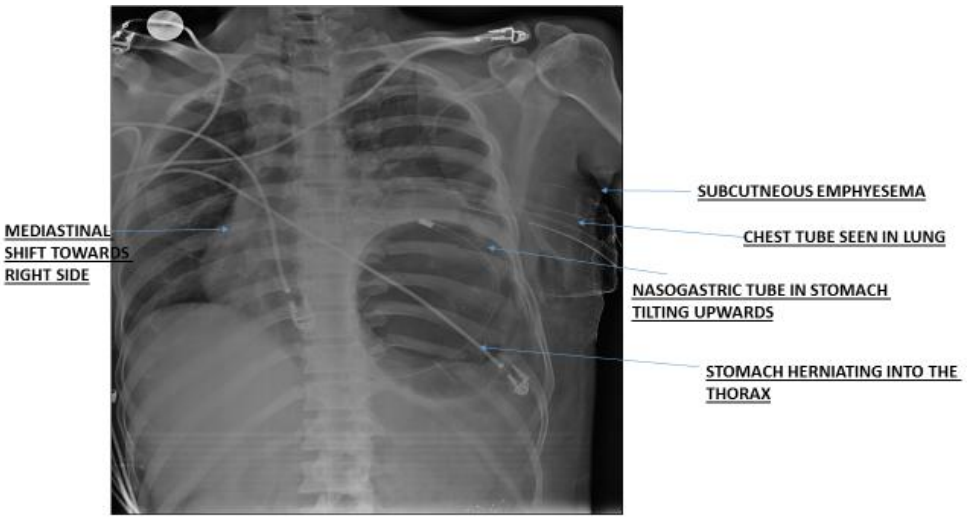

Figure 1 preoperative x-ray

Figure 2 CT SCAN 3D RECONSTRUCTION SHOWING RIB FRACTURE

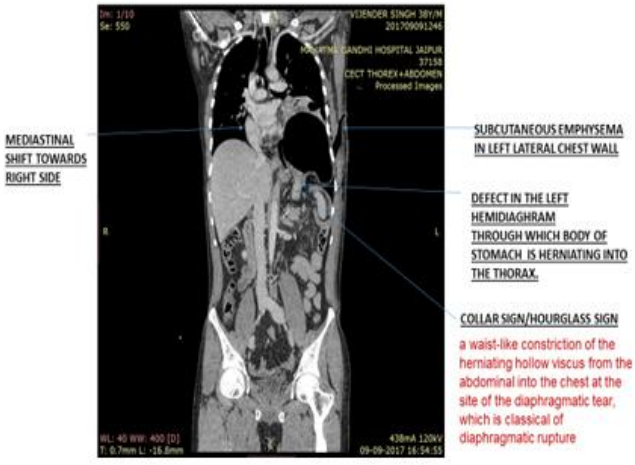

Figure 3 CT SCAN

Figure 4 POSTION OF THE PATIENT

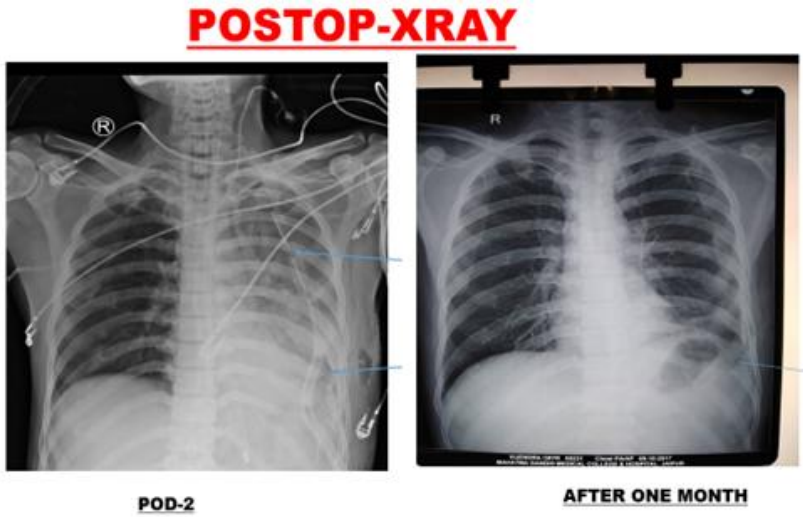

Figure 5 and 6

Figure 7 PREOPERATIVE X-RAY OF CHEST

Figure 8 CT SCAN OF CHEST

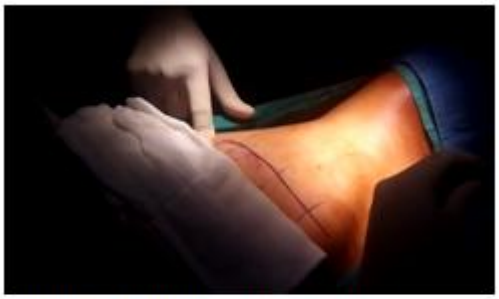

Figure 9 PRIOR TO INCISION

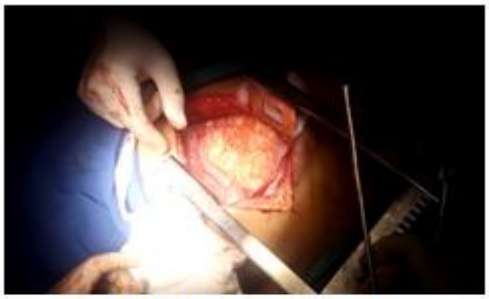

Figure 10 INTRAOPERATIVE FINDING

Figure 11 INTRAOPERATIVE PICTURE SHOWING GUT IN THORAX

References

[1]. Patrizio Petrone et al, Diaphragmatic injuries and post-traumatic diaphragmatic hernias, current problems in surgery 2016
[2]. Riolfi(cited by Hedblom). Bulletin dellaSocietáLancisianadegliospedali di Roma. Zantralbl Chir1893:873.
[3]. Paré A. Oeuvres Completes d'AmbroiseParé. In: Malgaigne JF, ed. Paris, France. Bailliere, 1840-1841, vol. 11, pp 94-100.
[4]. Hamby WB.The Case Reports and Autopsy Records of AmbroiseParé Spring field, IL: Charles C. Thomas; 1960; p 50–51.
[5]. Crandall M, Popowich D, Shapiro M, West M. Posttraumatic hernias: historical overview and review of the literature. Am Surg.2007 Sep;73(9):845–850.
[6]. Seket B, Henry L, Adham M, Partensky C. Right-sided post traumatic diaphragmatic rupture and delayed hepatic hernia.Hepatogastroenterology.2009 Mar-Apr;56(90):504–507.
[7]. Singh S, Kalan MM, Moreyra CE, Buckman RF Jr. Diaphragmatic rupture presenting 50 years after the traumatic event. J Trauma.2000 Jul;49(1):156–159.
[8]. Wood NE, Stutzman FL. Right diaphragmatic hernia secondary to trauma; with report of two cases. Calif Med. 1959 Nov; 91:25–254.
[9]. Rush VW, Ginsberg RJ. Chest wall, pleura, lung and mediastinum. In Schwartz SI, Shires GT, Spenser FC, Daly JM, Fischer JE, Galloway AC. Principle of Surgery, 7th edition, New York: McGraw-Hill Company, 1999:685.
[10]. Paisal P. Repair of chronic post traumatic diaphragmatic hernia by laparoscopic surgery. The Thai Journal of Surgery 2001; 22: 11-4.
[11]. Meyers BF, McCabe CJ. Traumatic diaphragmatic hernia: occult marker of serious injury. Ann Surg 1993;218:783–90.
[12]. Boulanger BR, Milzman DP, Rosati C, Rodriquez A. A comparison of right and left blunt traumatic rupture. J Trauma 1993;35:255–60.
[13]. Shanmuganathan K, Killeen K, Mirvis SE et al (2000) Imaging ofdiaphragmatic injuries. J Thorac Imaging 15(2):104–111
[14]. Killeen KL, Mirvis SE, Shanmuganathan K (1999) Helical CT ofdiaphragmatic rupture caused by blunt trauma. AJR Am J Roentgenol 173(6):1611–1616
[15]. Mizobuchi T, Iwai N, Kohno H, Okada N, Yoshioka T, Ebana ,H. Delayed diagnosis of traumatic diaphragmatic rupture.GenThoracCardiovasc Surg.2009 Aug;57(8):430–432.
[16]. McCutcheon BL, Chin UY, Hogan GJ, Todd JC, Johnson RB, Grimm CP. Laparoscopic repair of traumatic intrapericardial diaphragmatic hernia. Hernia. 2010 Dec;14:647-649. Epub 2009Dec 1.
[17]. Ver MR, Rakhlin A, Baccay F, Kaul B, Kaul A. Minimally invasive repair of traumatic right-sided diaphragmatic hernia with delayed diagnosis.JSLS.2007;11:481–486
[18]. Jonathan Pulido et al, Laparoscopic Repair of Chronic Traumatic Diaphragmatic Hernia using Biologic Mesh with Cholecystectomy for Intrathoracic Gallbladder, JSLS (2011)15:546–549

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