

Management of Traumatic Diaphragmatic Rupture Repair

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Abstract: Traumatic diaphragmatic hernias are uncommon, yet associated with high mortality. The colon very rarely herniated through the diaphragmatic defect. Acute traumatic rupture of the diaphragm may go unnoticed and there is often a delay between the injury and the diagnosis.

Keywords: Traumatic diaphragmatic hernias, mechanism of injury, duration, presentation.

1. INTRODUCTION

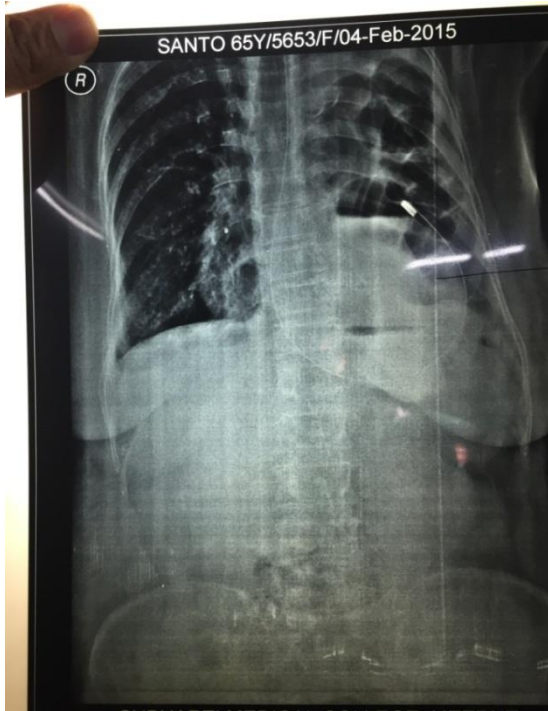
Diaphragmatic rupture is a life-threatening condition. Diaphragmatic injuries are quite uncommon and often result from either blunt or penetrating trauma. It occurs in 0.8 to 5% of patients admitted to hospital with thoraco-abdominal trauma. Diaphragmatic ruptures are usually associated with abdominal trauma however, it can occur in isolation. Acute traumatic rupture of the diaphragm may go unnoticed and there is often a delay between the injury and the diagnosis. A comprehensive literature search was performed using the terms "delayed presentation of post traumatic diaphragmatic rupture" and "delayed diaphragmatic rupture". The diagnostic and management challenges encountered are discussed, together with strategies for dealing with them. We have focussed on mechanism of injury, duration, presentation.

2. CASE PRESENTATION

A 65-year-old lady presented with alleged history of RTA IN SUBHARTI MEDICAL COLLEGE MEERUT with c/o abdominal pain localized in the left upper quadrant, and vomiting, left sided chest pain. The patient had inconstant symptoms including shortness of breath and dyspnea. No history of loss of consciousness, headache seizures etc.

On physical examination, bowel sounds were present in the left hemi-thorax on auscultation. A chest X-ray showed elevation of the left hemi-diaphragm, with a portion of the colon and the small intestine transposed in the left hemi-thorax as a diaphragmatic rupture. Computed tomography (CT) scan confirmed.

The patient underwent left thoracotomy, and herniation of the left colon and small intestine. There were no ischemic changes or perforation, but the colon was slightly edematous. No resection of any part of the intestinal tract was necessary. The colon and the small intestine were reduced into the abdomen. As usual in traumatic lesions, there was absence of the hernial sac, the hernia opening was around 30 mm in length. The hernia opening was repaired with interrupted non-absorbable sutures; placement of a polymeric prosthetic mesh was not required at the time of the intervention. A drain was placed in the right side of the thorax. The thoracic drain was removed on the 7th post-operative day and the patient was discharged 9th post-operative day.



3. DISCUSSION

Blunt diaphragmatic rupture is a rare event. Because of its low incidence and presence of associated injuries, early diagnosis is difficult [3]. Usually the diaphragmatic injury can be traced back to a violent force applied to the abdomen or chest.

We diagnosed our patient with diaphragmatic rupture after the blunt trauma (motor vehicle crash) and left rib fractures had occurred. The patient's symptoms included abdominal pain and vomiting in presentation. Routine hematologic and biochemical investigations were normal. The diaphragmatic hernia was diagnosed by chest X-ray, which showed diaphragm elevation, with a gas shadow in the lower chest that was due to a portion of the colon and the small intestine being transposed into the left hemithorax. The CT scan confirmed the diagnosis. During the procedure, the defect in the posterolateral area of the diaphragm was found to be quite small, and the herniated right colon and small intestine were reduced into the abdomen without complications. Diaphragmatic ruptures may be revealed many years after the initial trauma, presenting as abdominal visceral herniation and complications such as strangulation and perforation (3-7).

Missed blunt diaphragmatic rupture results in herniation of the abdominal organs into the chest due to the abdominothoracic pressure gradient, which progressively enlarges the diaphragm defect. Progressive herniation results in chronic abdominal or/and chest pain, constipation, strangulation and perforation of the abdominal viscera, with shortness of breath, dyspnea, and respiratory infections due to compression of the lung on the affected side. Although very rare, a colopleural fistula through a diaphragmatic hernia has been described in the literature [8].

There are various surgical approaches for diaphragmatic hernias repair. Mesh patches are widely used. Polytetrafluoroethylene (Gore-Tex), polyethylene terephthalate (Dacron) and polypropylene are the most common materials used in prosthetic patches to repair large diaphragmatic defects that are not amenable to primary repair. Recently, some authors suggested the use of a newer biologic material which is composed by a sheet of collagen derived from porcine dermis [9]. However, there are cases in the literature reporting patch infection and hernia recurrence after the use of a mesh [10,11], thus we believe that primary repair with non-absorbable sutures is the best alternative for diaphragm repair, as it reduces infection risk and the costs of the procedure.

4. CONCLUSIONS

Suspicion of diaphragmatic rupture in a patient with multiple trauma injuries contributes to an earlier correct diagnosis. Early diagnosis is very important for appropriate surgical management, reducing the risks of visceral strangulation and its complications. Surgical repair remains the only curative treatment for diaphragmatic hernias because such hernias are invariably associated with strangulation. Primary repair with non-absorbable sutures remains the gold standard for the closure of small to moderate sized defects. Patients with large defects may require patch closure with a mesh, but these can risk.

REFERENCES

- [1] De lesquen H et al. Interact cardiovascthorac surg. 2015 ,surgical management of blunt trauma of chest.
- [2] Wigley j et al. Ann r collsurgengl .2014 thoracoabdominal herniation.
- [3] Hofmann s, et al. GMS interdisclipplastreconstrsurgdpgw. 2012 , traumatic diaphragmatic rupture : clinical presentation ,diagnosis and surgical approach.
- [4] Nwafor1A, et al. Niger j med 2011 traumatic diaphragmatic rupture through control tendon with herniation of stomach and bowel.
- [5] Bekdash B, Singh B, Lakhoo K: Recurrent late complications after congenital diaphragmatic hernia repair with prosthetic patches. A case series. J Med Case Rep 2009, 3:7237. BioMed Central Full TextReturn to
- [6] Matsevych OY: Blunt diaphragmatic rupture: four year's experience. Hernia 2008, 12:73-78. PubMed Abstract | Publisher Full Text
- [7] Hanna WC, Ferri LE, Fata P, Razek T, Mulder DS: The current status of traumatic diaphragmatic injury: lesson learned from 105 patients over 13 years. Ann ThoracSurg 2008, 85:1044-8. PubMed Abstract | Publisher Full Text Return to text

- [8] Turhan K, Makay O, Cakan A, Samancilar O, Firat O, Icoz G: Traumatic diaphragmatic rupture: look to see. *Eur J CardiothoracSurg* 2008, 33:1082-1085. PubMed Abstract | Publisher Full TextReturn to text.
- [9] Mitchell IC, Garcia NM, Barber R, Ahmad N, Hicks BA, Fisher AC: Permacol: a potential biologic patch alternative in congenital diaphragmatic hernia repair. *J PediatrSurg* 2008, 43:2161-64. PubMed Abstract | Publisher Full Text.
- [10] Healy DG, Veerasingam D, Luke D, Wood AE: Delayed discovery of diaphragmatic injury after blunt trauma: report of three cases. *Surg Today* 2005, 35:407-410. PubMed Abstract | Publisher Full Text.
- [11] Moss RL, Chen CM, Harrison MR: Prosthetic patch durability in congenital diaphragmatic hernia: a long-term follow-up study. *J PediatrSurg* 2001, 36:152-154. PubMed Abstract | Publisher Full Text.