

Isolated Traumatic Giant Diaphragmatic Hernia Mimicking a Haemopneumothorax: A Report of Two Cases

Mohammad Sadik Akhtar, Mohammad Hanif Beg and Ashwani Kumar

Division of Cardiothoracic Surgery, Department of Surgery, J.N. Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India

ABSTRACT

We report two cases who presented with respiratory distress after trauma that were treated for a left-sided haemopneumothorax. These were finally diagnosed as giant diaphragmatic hernias. The diagnostic difficulties and complications arising out of a wrong diagnosis are discussed. [Indian J Chest Dis Allied Sci 2012;54:259-261]

Key words: Diaphragmatic hernia, Haemopneumothorax.

INTRODUCTION

Various presentations of diaphragmatic hernias have been reported ranging from an emergency to asymptomatic but the condition is frequently overlooked.¹ Traumatic rupture of the diaphragm is a serious injury that is often difficult to diagnose.² It is a recognised consequence of high velocity blunt trauma to the abdomen, usually as a result of motor-vehicle accident, and occasionally, penetrating thoraco-abdominal trauma. The incidence of diaphragmatic rupture after blunt thoracic and abdominal trauma is 0.8 percent to 5 percent.³⁻⁶ The diagnosis is often delayed due to absence of typical symptoms or other major injuries.⁷ An isolated blunt traumatic diaphragmatic rupture is rare.^{4,8} We present two cases of isolated blunt traumatic diaphragmatic rupture with massive viscerothorax mimicking a haemopneumothorax.

CASE REPORTS

Case 1

A 12-year-old female labourer sustained injury by mud slide. She was taken to a private hospital where an intercostal chest drainage tube was placed after evaluation and chest radiograph, suspecting a haemopneumothorax. After three days when she failed to improve, she was referred to the emergency department of our hospital with tube *in-situ*. On arrival, she was alert but dyspnoeic. The breath

sounds over the left side of the chest were decreased with the presence of bowel sounds. There were no obvious external injuries. Abdominal examination was normal except for an emptiness in the left upper abdomen. The initial chest radiograph (Figure 1) showed haziness in the right hemithorax with doubtful presence of bowel loops. We confirmed the

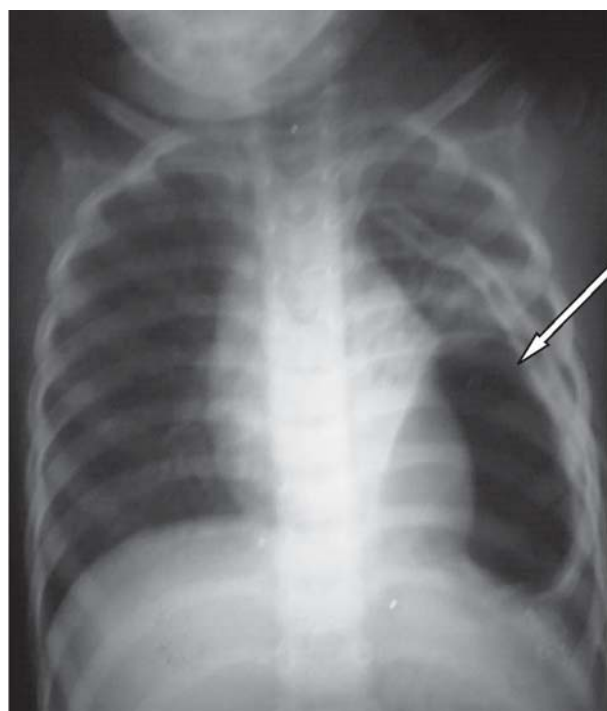


Figure 1. Chest radiograph (postero-anterior view) showing an intercostal tube *in situ* and a huge air bubble in the left hemithorax pushing the mediastinum to the opposite side.

[Received: August 26, 2011; accepted after revision: March 30, 2012]

Correspondence and reprint requests: Dr M.H. Beg, Professor and Head, Department of Surgery, J.N. Medical College, Aligarh Muslim University, Aligarh-202 002 (Uttar Pradesh), India; Phone: 09760264780; E-mail: mhbeg@rediffmail.com

diaphragmatic rupture with contrast upper gastrointestinal study (Figure 2).

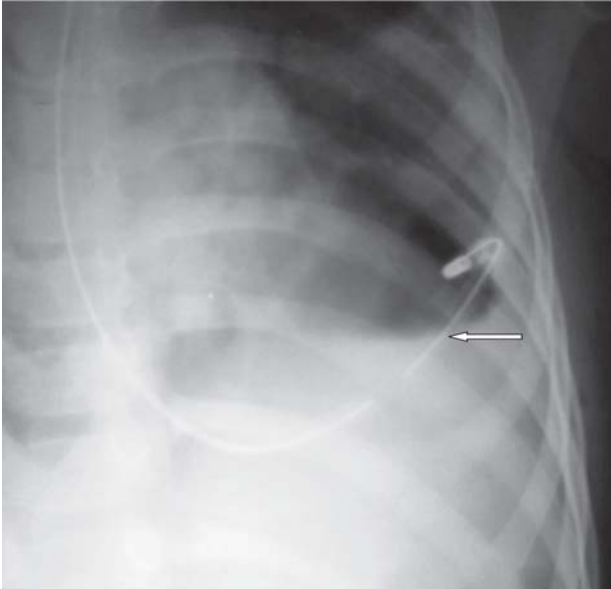


Figure 2. Tip of nasogastric tube seen in the left hemithorax suggestive of stomach herniation.

The patient was immediately subjected to emergency surgery and a left thoracotomy was performed. A large tear involving medial three-fourth of the diaphragm was seen. Stomach, spleen, colon and small bowel were found herniated through the gap without any injury to these structures (Figure 3). The left lung was collapsed. The diaphragmatic rupture was repaired after reducing the viscera.

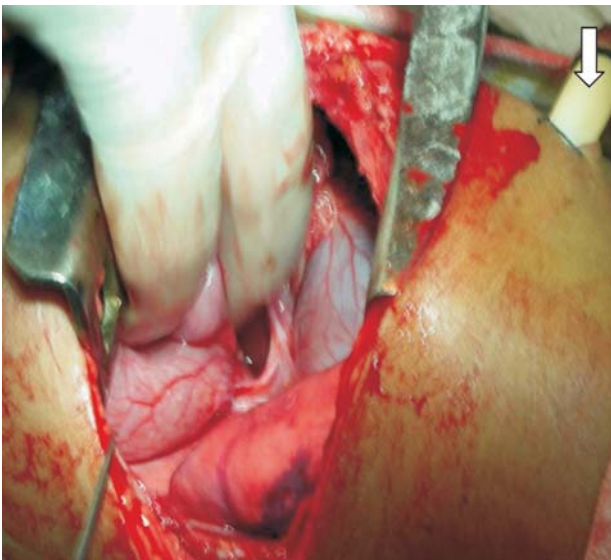


Figure 3. Operative photograph revealing tear in the left dome of the diaphragm with herniation of the abdominal viscera.

Case 2

A 5-year-old female child suffered a road-traffic accident while she was travelling with her family.

Immediately after the accident, the child had severe respiratory difficulty and was taken to a medical centre. After evaluation and radiographs, an intercostal chest drainage tube was inserted in the left hemithorax suspecting a haemopneumothorax. However, the condition of the child worsened and she was referred to emergency department of our hospital. We confirmed the diagnosis by inserting a nasogastric tube which was shown displaced in the left hemithorax on chest radiograph (Figure 4). An emergency left thoracotomy was performed revealing a tear of the diaphragm and viscerothorax. The viscera was reduced into the abdomen and diaphragmatic tear was repaired.

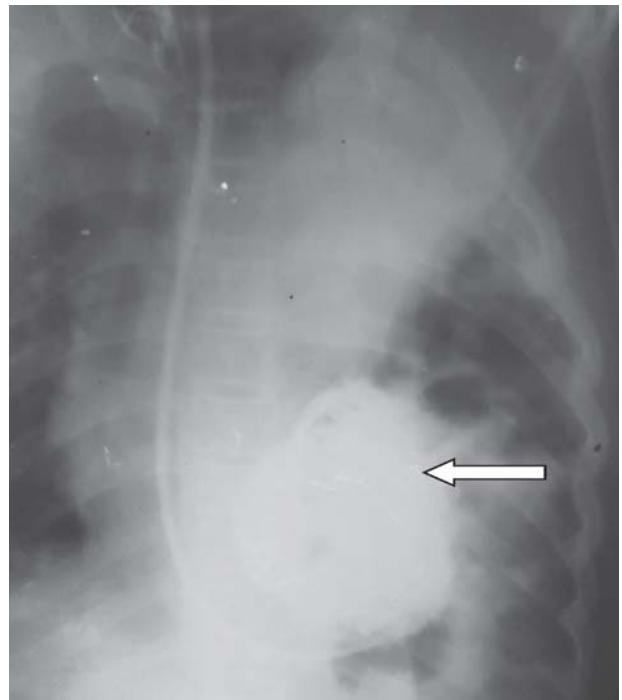


Figure 4. Gastric conray study showing herniated stomach and other abdominal viscera.

Both the patients recovered uneventfully and are doing well at three-month follow-up.

DISCUSSION

An isolated blunt traumatic diaphragmatic rupture is rare. Its incidence after blunt thoracic and abdominal trauma is 0.8 percent to 5 percent.³⁻⁶ Approximately 69% of hernias are left-sided, 24% are right-sided, and 15% are bilateral.^{9,10} Despite an increased awareness, the condition is still frequently missed and delayed. Symbas *et al*,¹¹ observed a delay in the diagnosis in 8% of cases of diaphragmatic injury ranging from 18 hours to 15 years after the injury. Approximately 23% to 73% of traumatic diaphragmatic ruptures will be detected on initial

chest radiograph, with an additional 25% detected on subsequent films.¹² The difficulty in a quick diagnosis and high morbidity and mortality rates associated with untreated cases make this clinical entity more important.¹³ Inadvertent placement of an intercostal chest drainage tube will add a pneumothorax (if not already present) and likely cause of clinical deterioration. Tube thoracostomy may result in penetration of abdominal viscus with consequent spillage of the intestinal contents into the chest cavity.¹⁴ When diaphragmatic injuries cannot be recognised in the acute phase of the trauma, the affected structures may be strangulated into the thorax, and therefore, the mortality rate may increase from 20 percent to 80 percent.¹³

Regardless of the mechanism of the injury, the early recognition of blunt traumatic diaphragmatic rupture usually depends on a high index of suspicion. Clinical diagnosis of a ruptured hemi-diaphragm is difficult but may be suggested by the presence of audible bowel sounds, absent breath sounds on the affected side and respiratory distress.¹⁵ On a chest radiograph, the diagnostic criteria suggestive of a ruptured diaphragm are the presence of bowel loops in the chest, a nasogastric tube above the diaphragm and a markedly elevated hemi-diaphragm.¹⁵ When the clinical and chest radiographic findings suggest a diaphragmatic injury, appropriate contrast gastrointestinal studies may be helpful as conclusive diagnostic tools.¹³

Traumatic diaphragmatic hernias usually require early surgical treatment.¹⁶ Early and correct diagnosis and treatment reduces intra- and post-operative morbidity and mortality.¹⁷

REFERENCES

1. Gupta S, Bali RK, Das K, Sisodia A, Dewan RK, Singla R. Rare presentation of spontaneous acquired diaphragmatic hernia. *Indian J Chest Dis Allied Sci* 2011;53:117-9.
2. Adler DH. Blunt diaphragmatic injury in a 7-year-old girl. *J Emerg Med* 2002;23:39-42.
3. Schumpelick V, Steinau G, Schluper I, Prescher A. Surgical embryology and anatomy of the diaphragm with surgical applications. *Surg Clin North Am* 2000;80:213-39.
4. Rashid F, Chakrabarty MM, Singh R, Iftikhar SY. A review on delayed presentation of diaphragmatic rupture. *World J Emerg Surg* 2009;4:32.
5. Chughtai T, Ali S, Sharkey P, Lins M, Rizoli S. Update on managing diaphragmatic rupture in blunt trauma: a review of 208 consecutive cases. *Canadian J Surg* 2009;52:177-81.
6. Nishijima D, Zehbtachi S, Austin RB. Acute posttraumatic tension gastrothorax mimicking acute tension pneumothorax. *Am J Emerg Med* 2007;25:734-6.
7. Al-Refaie RE, Awad E, Mokbel EM. Blunt traumatic diaphragmatic rupture: a retrospective observational study of 46 patients. *Interact Cardiovasc Thorac Surg* 2009; 9:45-9.
8. Ward RE, Flynn TC, Clark WP. Diaphragmatic disruption secondary to blunt abdominal trauma. *Trauma* 1981; 21:35-8.
9. Kuhlman JE, Pozniak MA, Collins J, Knisely BL. Radiographic and CT findings of blunt chest trauma: aortic injuries and looking beyond them. *Radiographics* 1998;18:1085-106.
10. Feliciano DV, Cruse PA, Mattox KL, Bitondo CG, Burch JM, Noon GP. Delayed diagnosis of injuries to the diaphragm after penetrating wounds. *J Trauma* 1988;28:1135-44.
11. Symbas PN, Vlasis SE, Hatcher C Jr. Blunt and penetrating diaphragmatic injuries with or without herniation of organs into the chest. *Ann Thorac Surg* 1986; 42:158-62.
12. Sliker C. Imaging of diaphragm injuries. *Radiol Clin North Am* 2006;44:199-211.
13. Shetty P, Selvaraju K. A rare case of isolated blunt traumatic diaphragmatic rupture. *WebmedCentral GASTROINTESTINAL* 2010;1:WMC001183.
14. McCann B, O'Gara A. Tension viscerothorax: an important differential for tension pneumothorax. *Emerg Med J* 2005;22:220-21.
15. Gelman R, Mirvis SE, Gens D. Diaphragmatic rupture due to blunt trauma: sensitivity of plain chest radiographs. *AJR Am J Roentgenol* 1991;156:51-7.
16. Shah R, Sabanathan S, Mearns AJ. Traumatic rupture of the diaphragm. *Ann Thorac Surg* 1995;60:1444-9.
17. Mihos P, Potaris K, Gakidis. Traumatic rupture of the diaphragm: experience with 65 patients. *Injury* 2003;3: 169-72.

Full text articles published in IJCDAS from July-September 2003 onwards can be accessed online on Internet through the following sites

V.P. Chest Institute's site: <http://www.vpci.org.in>

Indmed's site: <http://medind.nic.in>

Guidance for Authors appears in every issue.

Authors' Index appears in the last issue of the year

Clinical Trials Registry-India

A Clinical Trials Registry-India has been set up jointly by the Department of Science and Technology (DST), World Health Organisation (WHO) and Indian Council of Medical Research at the National Institute of Medical Statistics (NIMS), New Delhi. This Registry will provide a platform for registration of all clinical trials. The objective of the Registry is to establish a public record system by registering all prospective clinical trials of any intervention (drug, surgical procedure, preventive measures, lifestyle modifications, devices, educational or behavioural treatment, rehabilitation strategies and complementary therapies) conducted in India involving human participants. The Registry will be made publicly available on the internet at no cost. The website of the Indian Registry is www.ctri.in.