CASE REPORT

Diaphragmatic hernia: an unusual presentation

Neha Shah,¹ Roland Fernandes,¹ Amit Thakrar,¹ Hamoun Rozati²¹William Harvey Hospital, London, UK²North Middlesex University Hospital NHS Trust, London, UK**Correspondence to**Dr Hamoun Rozati,
h.rozati@nhs.net**SUMMARY**

A 53-year-old lady presented to A&E with a 3-day history of severe epigastric pain and vomiting. This was preceded by a 3-month history of generalised abdominal discomfort, early satiety and increasing shortness of breath. A CT scan showed a left-sided posterior diaphragmatic defect. Urgent repair of the hernia showed herniation of three-quarter of the stomach, half of the transverse colon, the 13 cm spleen and the pancreas in the chest. There were no postoperative complications. Traumatic diaphragmatic hernias are known to be a complication of major trauma. However, the patient in this case report presented acutely, after mild physical trauma related to using a rowing machine. This exercise, when not performed correctly can raise intra-abdominal pressure. It is plausible that this trauma, although mild, was sufficient in causing the lady's diaphragmatic hernia. This case would suggest that the trauma required to cause a diaphragmatic hernia need not be as severe as originally thought.

BACKGROUND

Diaphragmatic hernias are rare in adults and usually present with vague gastrointestinal and respiratory symptoms, which can easily mimic other more common diseases. They are classified as either being congenital or traumatic—the latter being associated with severe abdominal trauma. This is an interesting case of a diaphragmatic hernia with debatable aetiology.

CASE PRESENTATION

A 53-year-old lady presented to A&E with a 3-day history of severe epigastric pain and vomiting. This

was preceded by a 3-month history of generalised abdominal discomfort, early satiety and increasing shortness of breath. Within these 3 months, she had been investigated as an outpatient with an ultrasound scan and an endoscopy. The endoscopy had shown a hiatus hernia with associated Barrett's oesophagus, for which she had been started on omeprazole. The ultrasound scan had been reported as normal.

A chest x-ray ordered in A&E showed bowel loops in the left lung field (figure 1). This was followed up by a CT scan (figure 2), which showed a left-sided posterior diaphragmatic defect. This defect measured 59 mm, with resultant herniation

Figure 1 Chest x-ray showing bowel loops in the left chest and tracheal deviation to the right.

Figure 2 (A) CT scan of the chest showing loops of bowel, stomach and spleen in the left chest. (B) CT scan of the chest showing loops of bowel, stomach and spleen in the chest.

To cite: Shah N, Fernandes R, Thakrar A, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-008699

of almost the entire stomach and splenic flexure and atelectasis of the left lower lobe. Owing to persistent vomiting, she was unable to tolerate oral intake and consequently an urgent repair of her hernia was undertaken.

TREATMENT

Repair of the large diaphragmatic hernia was achieved laparoscopically and the hernial defect reinforced with a Strattice mesh. Five port sites enabled access to the upper abdomen and adequate liver retraction was essential. Owing to the size of the hernia, the actual diaphragmatic defect had to be extended to allow access to the hernial contents and allow safe dissection of the adhesions present. Intraoperatively it was noted that the oesophageal–gastric junction was found to lie at the same level as the fundus. The rest of the stomach had herniated through the diaphragmatic defect into the left chest.

The herniation was found to contain three-quarter of the stomach, half of the transverse colon including the splenic flexure, the whole of the 13 cm spleen and the pancreas were in the chest. The left lung had collapsed and the left kidney was close to the defect.

The stomach, colon, pancreas and spleen were carefully pulled into the abdomen. The left kidney had to be mobilised slightly to allow freeing of the area on top of the diaphragmatic defect. The defect was converted into a Z and opposed with interrupted and continuous Ethibond sutures. This was reinforced by a Strattice mesh (figure 3).

OUTCOME AND FOLLOW-UP

The postoperative course was uneventful. The chest drain was left in situ for 4 days in total, at which point the lungs were

clear on examination and on chest x-ray. The patient was discharged on day 5 postoperatively.

DISCUSSION

In this case, it is not apparent if the diaphragmatic hernia was congenital or traumatic.

Traumatic diaphragmatic hernias are known to be caused by major trauma—most commonly blunt trauma (road traffic accidents) or less commonly penetrating trauma (gunshots and stab wounds).^{1–3} These patients usually have multisystem injuries because of the large force required to rupture the diaphragm.⁴ It is the abrupt change in intra-abdominal pressure that produces the injury in the diaphragm, either as a laceration or an avulsion.⁵

However, there has been a case reported previously, where a 12-year-old boy sustained a diaphragmatic hernia by hitting the side of his teacher's desk while running. The trauma was not severe enough to require any hospital admission at the time of injury and caused no associated injuries. In contrast to common belief, this case report suggests that the trauma required to cause a diaphragmatic hernia need not be as severe as commonly thought.⁶

In the case we describe, the patient's symptoms started suddenly while exercising on a rowing machine. Although she had been using this machine asymptotically for the past few months, during this particular episode she had 'pulled a muscle', suggesting incorrect use of the machine. When not performed correctly and especially if expiring during the drive, this exercise can cause a sudden and significant rise in intra-abdominal pressure.⁷ It could be debated that this rise in pressure was sufficient to cause or exacerbate this patient's

Figure 3 (A) Hernial defect with lower part of the stomach and transverse colon. (B) Hernial defect which has been enlarged and now demonstrates the entire spleen lying within the chest cavity. (C) Contents returned to abdomen and the defect closed with interrupted sutures. (D) Biological mesh used to reinforce repaired defect.

diaphragmatic hernia. This theory is supported by the presence of flimsy splenic adhesions, which suggest that splenic migration into the chest was more of an acute process which is in keeping with this 3-month history.

Unfortunately, there is little previous imaging with which to compare. The only x-ray that the patient had, was 15 years prior to this admission (for investigation of pneumonia). Although access to this x-ray is no longer possible (radiographic films greater than 10 years old are no longer stored), there is no mention of any signs of a diaphragmatic hernia in the notes from this admission. This, again, makes the diagnosis of a traumatic diaphragmatic hernia more likely than a congenital hernia.

Against the above hypothesis, the size of the spleen (13 cm) in comparison to the size of the defect (5.9 cm) is suggestive that the spleen must have migrated to the chest prior to development, supporting a diagnosis of a congenital diaphragmatic hernia.

Learning points

- ▶ This case suggests that despite common belief, minor trauma (including inappropriate physical exercise), can be the cause of a traumatic diaphragmatic hernia.
- ▶ Although rare, diaphragmatic hernias should be on the list of differential diagnoses in patients presenting with acute gastrointestinal and respiratory symptoms. History of only a mild trauma should not exclude the diagnosis.
- ▶ The technique applied when performing physical activity is very important in preventing complications, and thus good technique is something that should be well publicised.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Fajolu OL. Traumatic diaphragmatic hernia. *J Natl Med Assoc* 1984;76:1163–4.
- 2 Sacco R, Quitadamo S, Rotolo N, *et al*. Traumatic diaphragmatic rupture: personal experience. *Acta Biomed* 2003;74:71–3.
- 3 Mihos P, Potaris K, Gakidis J, *et al*. Traumatic rupture of the diaphragm: experience with 65 patients. *Injury* 2003;34:169–72.
- 4 Meyers BF, McCabe CJ. Traumatic diaphragmatic hernia. Occult marker of serious injury. *Ann Surg* 1993;218:783–90.
- 5 Shackleton KL, Stewart ET, Taylor AJ. Traumatic diaphragmatic injuries: spectrum of radiographic findings. *Radiographics* 1998;18:49–59.
- 6 Rubio PA. Unusual cause of traumatic diaphragmatic hernia in a 12-year-old boy. *South Med J* 1990;83:260–1.
- 7 Manning TS, Plowman SA, Drake G, *et al*. Intra-abdominal pressure and rowing: the effects of inspiring versus expiring during the drive. *J Sports Med Phys Fitness* 2000;40:223–32.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow