Late presentation of diaphragmatic hernia: a missed diagnosis

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Epigastric pain after eating and a history of trauma may suggest a ruptured diaphragm

Intermittent epigastric discomfort, often occurring after eating, is not uncommon. In many cases the diagnosis is apparent, but this is not always so. One cause that should always be considered when there is a history of trauma is rupture of the diaphragm that has been missed.

Pain is the main symptom, which is aggravated by taking food, particularly large meals and effervescent drinks. The pain is usually felt in the lower chest or epigastrium and relieved by belching. The picture may change dramatically without warning, and continuous pain with or without signs of intestinal obstruction heralds impending bowel infarction and needs to be investigated and treated urgently. A chest radiograph taken at any stage in the development of this condition is almost always abnormal.

Case 1

A 28 year old woman presented to hospital with acute onset of dyspnoea and chest pain on the left side after drinking a gin and tonic. Examination showed cyanosis with appreciable dyspnoea and pronounced tachycardia. The only other finding was bowel sounds in the left chest. A chest radiograph taken at admission showed intestinal markings in the left chest (fig 1).

When a nasogastric tube was passed there was intestinal decompression and a reduction of the herniated viscera. When the patient was questioned further she said that she had been in a road traffic accident four years previously and was admitted to hospital with a head injury and multiple rib fractures. Since that time she had presented to several general practitioners complaining of left hypochondrial pain after eating. A chest radiograph had not been taken since the injury, and she was told that the pain was all in her mind when an ultrasound study showed no abnormality.

Her condition was stabilised and she was transferred to our unit, where the rupture was repaired through a left seventh intercostal space thoracotomy. She made an uneventful postoperative recovery and subsequently remained asymptomatic.

FIG 1—Case 1. Chest radiograph of patient at presentation

FIG 2—Case 2. Radiograph of barium meal examination of patient showing stomach in right chest

Case 2

A 59 year old man presented to hospital with a four month history of intermittent haematemesis, culminating in a severe episode associated with melaena. He had been in a road traffic accident two years previously, in which he sustained a number of fractures and required ventilation in the intensive care unit for six weeks. There had been difficulty weaning him from the ventilator, and sequential chest radiographs showed persistent shadowing at the base of the right chest, which was interpreted as "basal collapse." Examination showed that he was fit and had no signs of shock. The only abnormal finding was melaena on rectal examination. A chest radiograph taken at admission showed basal shadowing on the right side, which was interpreted initially as basal atelectasis.

Examination with a flexible oesophagogastroduodenoscope was arranged, but after the gastroscope was introduced and air entered the stomach he had a respiratory arrest with bradycardia. He was resuscitated and a repeat chest radiograph showed increased shadowing at the right base and a loop of bowel in the right chest. He was transferred to our unit, and a barium meal examination confirmed that the stomach was in the right chest (fig 2). He underwent immediate reduction and repair of the hernia through a right thoracotomy incision. He had an uneventful recovery and subsequently remained asymptomatic.

Case 3

A 30 year old woman was admitted to hospital with vomiting and pain in the lower abdomen and tip of the left shoulder. She was six months pregnant. She had been admitted to hospital three years previously after a road traffic accident in which she sustained fractures to the left ribs and pelvis. Eighteen months before the

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Case No	Sex and age (years)	Injury	Presenting symptom	Results of chest radiograph	Tests
1	Female, 28	Road traffic accident four years earlier: fractured ribs; daily epigastric pain after taking food	Pain in left chest and severe dyspnoea	Bowel in left chest	None
2	Male, 59	Road traffic accident two years earlier: ventilated six weeks; intermittent haematemesis four months before presentation	Haematemesis and melaena; abdominal pain after taking food for 18 months	Stomach in right chest	Barium meal, confirmed
3	Female, 30	Road traffic accident three years earlier: fractured ribs and pelvis; required ventilation (chest radiograph normal)	Vomiting and abdominal pain: six months pregnant (similar problems in first pregnancy)	Bowel in left chest	Barium enema, confirmed
4	Male, 23	Road traffic accident four years earlier: repair of left ruptured diaphragm at that time; empyema after operation	Epigastric pain after taking food	Colon in left chest	Pneumoperitoneum: led to pneumothorax
5	Male, 66	Fell four years earlier; bruises on right	Melaena; intermittent abdominal pain for four years	Abnormal shadow in right base	Liver scan, liver in right chest
6	Male, 40	Road traffic accident five years earlier: paraplegic	Vomiting and abdominal pain	Bowel in left chest	None

present admission she had been admitted to hospital, during her first pregnancy, with severe abdominal pain that settled with conservative management. Examination showed a pregnant uterus consistent with her gestational dates. The abdomen was soft and not tender and examination of the chest was unremarkable. A chest radiograph showed loops of bowel in her left chest.

After admission her pain settled, but within 48 hours she developed severe abdominal pain. The defect in the diaphragm was repaired through a left seventh intercostal space thoracotomy. Viable colon adhering to the diaphragmatic defect was found and successfully reduced. Her recovery was uneventful and she subsequently remained asymptomatic.

Cases 4-6

Three further cases were managed and the table gives the details. All the patients had ruptures repaired through an appropriate thoracotomy incision. There were no deaths. The only complication was in the patient in case 4, who developed pain at the site of the thoracotomy which responded to simple analgesics.

Discussion

Over 13 years six patients with delayed presentation of rupture of the diaphragm were managed. The injury is uncommon, occurring in about 4% of victims of major closed chest or abdominal trauma.¹⁻⁴ Large pressure differentials between the chest and abdomen, generated at the time of injury, cause tearing of the dome of the diaphragm, more commonly on the left as the liver protects the right side by spreading the forces more evenly.⁵⁻⁸ The injury is indicative of severe trauma and injuries that accompany such trauma often take priority at presentation, resulting in injury to the diaphragm being overlooked. In some series this has been overlooked in up to roughly two thirds of patients.⁹⁻¹¹

The patient may present months or years later in one of two ways. The first way is with mild symptoms typically in the lower chest or epigastric pain occurring intermittently and often brought on by taking food; physical signs are minimal. This is the so called "latent" stage. The clinical picture may change dramatically and the patient present in the so called "late" stage with severe symptoms of pain, breathlessness, and intestinal obstruction or gastrointestinal haemorrhage. Examination may show that the patient is in shock. There may also be evidence of mediastinal shift, and bowel sounds may be audible in the chest. Nearly all such patients will have presented previously with minor "latent" symptoms.

Treatment at any stage of the illness requires an operation. Reduction of herniated contents and closure of the defect is undertaken at the time of diagnosis

through a laparotomy incision in the case of an acute onset^{5,12} and by an appropriate thoracotomy in chronic cases.^{3,4,7} Conservative management is contraindicated as the report of a case during pregnancy illustrates.¹³

Surgery performed during the "latent" stage carries a perioperative mortality of under 10%.^{4,5} When surgery is undertaken in the presence of strangulation, in the "late" stage, there is a mortality of between 20% and 80%.³

Prompt diagnosis of chronic cases is in the patient's best interest. As most patients will present with minor symptoms before presenting with a severe illness the diagnosis must always be borne in mind. A history of trauma is important and should always be pursued. A chest radiograph taken at any stage in the illness is almost always abnormal.^{3,5,14} If rupture of the diaphragm is suspected further investigation by, for instance, passing a nasogastric tube into an intrathoracic stomach,¹⁵ radio-opaque contrast studies,^{3,16} and diaphragmatic screening⁶ may help the diagnosis. Further tests such as pneumoperitoneum^{17,18} and thoracoscopy^{12,19} may be helpful but are best performed in specialised units. A positive diagnosis using ultrasound imaging may be helpful but a reported normal study does not exclude rupture of the diaphragm (case 1).

In all cases an accurate history, clinical alertness, and a chest radiograph are the key to diagnosis.

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