CONGENITAL HERNIA OF MORGAGNI IN CHILDREN

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The majority of congenital diaphragmatic hernias occur through the left posterolateral foramen of Bochdalek, and commonly these patients are symptomatic at birth.[1] Hernia through the foramen of Morgagni, on the other hand, is rare in children, representing 1%-6% of all types of congenital diaphragmatic hernia. It is usually asymptomatic and discovered accidentally, or if symptomatic it produces variable nonspecific symptoms which include respiratory or vague gastrointestinal symptoms, and because of this the diagnosis is usually delayed.[2,3]

Our experience with congenital diaphragmatic hernia shows this type of hernia to be unusually high in our patients. Awareness of this is of importance in order to obviate the associated morbidity. This report describes our experience with four patients with this unusual and rare type of congenital diaphragmatic hernia.

Patients and Methods

Over a period of seven years from 1989 to 1996, we treated 38 patients with different types of congenital diaphragmatic hernias (Table 2), four of which were cases of congenital Morgagni hernia. The charts of the four patients were reviewed for age at diagnosis, sex, mode of presentation, site of hernia, diagnostic investigations, operative management and outcome.

Results

The relevant demographic, clinical and operative findings are summarized in Table 1. All were males and three had right-sided hernia, while the fourth had bilateral hernia. Patient #1 was admitted to the hospital because of difficulty in breathing especially during feeding. His chest x-ray revealed a soft tissue density on the right side in the cardiophrenic angle. This was confirmed by CT scan of the chest, which showed an anterior mediastinal mass. On exploration via a right thoracotomy, this was found to be part of the left lobe of the liver herniating through a right-sided Morgagni's hernia with an intact sac.[4] The chest x-ray of patient #2 (who had repeated attacks of chest infection and a bulge of the anterior chest wall) showed anteriorly herniating bowel loops (Figure 1). This was confirmed by barium enema to be part of the colon (Figure 2). Patient #3 had septicemia at the age of eight days and repeated attacks of chest infection. His chest x-ray showed anteriorly placed bowel loops. This was confirmed to be colon by barium enema. Patient #4 (with bilateral Morgagni's hernia) was discovered accidentally. At the age of nine years, he was involved in a road traffic accident, and sustained a fracture of the left femur, fracture of the left superior pubic ramus and splenic injury. Preoperatively, his chest x-ray showed bowel loops herniating into the left side of the chest. This was confirmed by CT scan of the chest. Since he had been in an accident, the possibility of traumatic diaphragmatic hernia was suspected. Intraoperatively, he was found to have two congenital Morgagni hernias. The one on the left was

TABLE 1. *Types of congenital diaphragmatic hernia (38 patients).*

Type of hernia	No. of patients	Percentage
Congenital posterolateral	13 (10L, 3R)	34
Congenital agenesis of diaphragm	13 (L)	34
Congenital Morgagni hernia	4 (3R, 1 bilateral)	10.5
Congenital paraesophageal hernia	4 (2R, 2L)	10.5
Congenital anterolateral hernia	2 (L)	5.3
Congenital eventration of diaphragm	2 (R)	5.3

L=left; R=right.

TABLE 2. *Clinical and operative findings in patients with Morgagni's hernia.*

Age/sex	Symptoms	Site of hernia	Contents of sac
3 mon/M	Difficulty breathing, especially during feeding	Right	Part of left lobe of liver
6 mon/M	Repeated attacks of chest infection and a bulge of the anterior chest wall	Right	Colon
21 mon/M	Repeated attacks of chest infection	Right	Colon
9 y/M	Discovered accidentally during admission for road traffic accident	Bilateral	Large and small intestine on x-ray on left side, and part of left lobe of liver on right side

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large, measuring 12x10 cm, while the one on the right was 6x5 cm in size. At the time of surgery, the left sac was empty, while the right contained part of the left lobe of liver.

Three of the four patients were operated on via an upper midline incision, except patient #1, who had a right thoracotomy because of suspicion of an anterior mediastinal mass. A hernial sac was present in all patients. No other associated malformations were detected. Post-operatively all the patients recovered well.

Discussion

Anatomically, the foramen of Morgagni, a small anterior subcostosternal defect, extends from the sternum medially to the eight costal cartilages laterally. Morgagni's hernia is considered to be rare in the pediatric age group, representing between 1%-6% of all types of congenital diaphragmatic hernias.[2] Berman et al. in 1989 reported only 18 cases of Morgagni's hernia over a 40-year period from a large tertiary hospital, and the majority of these cases (15 patients) were diagnosed during the last 20 years.[3] Pokornay et al.,[6] in a series of 74 patients with congenital diaphragmatic hernia, found only 4 (5.4%) with Morgagni's hernia, and in Snyder and Greaney's series of 77 patients with congenital diaphragmatic hernias, only 1 (1.3%) had Morgagni's hernia.[7] Out of 38 patients with congenital diaphragmatic hernia, we saw four (10.5%) with Morgagni's hernia. This is surprisingly high when compared to other series.[1,6,8,9] The reason for this is not known. An increased awareness among pediatricians and general practitioners is a contributing factor, as the mode of presentation in these patients is variable and nonspecific. During childhood these patients are usually asymptomatic or present with repeated attacks of chest infection, or vague gastrointestinal symptoms which can be missed if not adequately investigated.[3] Although acute intestinal obstruction and colonic perforation have been reported in children with Morgagni's hernia, this is a rare occurrence.[10,11]

Morgagni's hernia occurs more often on the right side (90%) and is bilateral in 7% of cases. The rarity of a left-sided occurrence has been attributed to the reinforcing effect of the heart and pericardium. It is seen more commonly in males, although the reason for the male predilection is unclear. All our patients were male. Rapid weight gain and obesity, as well as a history of trauma, have been reported as contributing factors for the appearance of Morgagni's hernia during childhood.[12,13] Our nine-year-old patient sustained abdominal trauma, otherwise his hernias may have been asymptomatic.[5]

It is well known that Morgagni's hernia can be associated with other anomalies, but the reported incidence is variable. None of our patients had associated anomalies. Associated congenital heart disease is reported to be the most common, and its link with Down's syndrome is well established.[3,6,14,15] A 26% incidence of associated bowel malrotation in these patients calls for careful search and correction during operative repair of the hernia.[3]

FIGURE 1. Plain x-ray of the chest showing herniating and anteriorly placed bowel loop.

FIGURE 2. Barium enema showing anteriorly herniating bowel loops into the chest.

The diagnosis of Morgagni's hernia is usually established by routine chest x-ray with a lateral film to show the anteriorly placed bowel loops. This can be confirmed by barium enema, since the colon is the most common to herniate, or by barium meal and follow-through. The diagnosis can be difficult if the hernial sac contains omentum or liver, as in our first patient, as this

has to be differentiated from other lesions in the cardiophrenic angle.[4,11,12] Ultrasound and CT scan are advocated in such cases.

The operative approach to a Morgagni's hernia is either transthoracic[6] or via an abdominal approach,[3,15,16] but the majority advocate an upper midline abdominal incision. Like others, we prefer the abdominal approach for the following reasons: 1) it is easier to reduce the hernial contents and inspect them; 2) unrecognized hernia on the other side cannot be missed; 3) both hernial defects can be repaired if the defect is bilateral; 4) other associated anomalies which are not uncommon can be easily corrected. Had the hernia been diagnosed preoperatively in our first patient, he could have been spared the thoracotomy. Once diagnosed, early surgical repair of Morgagni's hernia is advocated to avoid the risk of bowel strangulation and perforation.[11,12]

References

1. Simson JNL, Eckstein HB. Congenital diaphragmatic hernia: a 20-year experience. Br J Surg 1985;72:733-6.
2. Cullen ML, Klein MD, Philippart AI. Congenital diaphragmatic hernia. Surg Clin North Am 1985; 65:1135-8.
3. Berman L, Stringer D, Ein SH, Shandling B. The late-presenting pediatric Morgagni hernia: a benign condition. J Pediatr Surg 1989;24:970-2.
4. Al-Salem AH, Al-Faraj AA, Al-Dabbous I. Morgagni hernia simulating an anterior mediastinal mass. Ann Saudi Med 1992;12:226-7.
5. Al-Salem AH. Incidental bilateral Morgagni hernia in a traumatized child. Aust N Z J Surg 1992;62:910-2.
6. Pokornay WJ, McGill CW, Herberg FJ. Morgagni hernias during infancy: presentation and associated anomalies. J Pediatr Surg 1984;19:394-7.
7. Snyder WH Jr, Greaney EM Jr. Congenital diaphragmatic hernia: 77 consecutive cases. Surgery 1965;57:576-88.
8. Baran EM, Houston HE, Lynn HB, O'Connell EJ. Foramen of Morgagni hernias in children. Surgery 1967;62:1076-81.
9. Thomas GG, Clitherow NR. Herniation through the foramen of Morgagni in children. Br J Surg 1977;64:215-7.
10. Kimmelstiel FM, Holgersen LO, Hilfer C. Retrosternal (Morgagni) hernia with small bowel obstruction secondary to a Richter's incarceration. J Pediatr Surg 1987;22:998-1000.
11. Cakmak O, Pektas O, Baskin D. Retrosternal hernia (Morgagni) with colonic perforation due to incarceration. Pediatr Surg Int 1990;5:274-5.
12. Groff DB. Diagnosis of a Morgagni hernia complicated by a previous normal chest x-ray. J Pediatr Surg 1990;25:556-7.
13. MacDougall JT, Abbott AC, Goodhand TK. Herniation through congenital diaphragmatic defects in adults. Can J Surg 1963;6:301-5.
14. El Awad ME. Diaphragmatic hernia in Down's syndrome. Ann Trop Paed 1989;9:43-4.
15. Al-Salem AH, Grant C, Khwaja S. Morgagni hernia: presentation in childhood. Saudi Med J 1991;12:301-3.
16. Wolloch Y, Grunebaum M, Glanz I, Dintsman M. Symptomatic retrosternal (Morgagni) hernia. Am J Surg 1974;127:601-5.