Treatment of Morgagni Hernias by Transabdominal Approach

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ABSTRACT

Background: *Recently, the thoracic approach has been suggested in the surgical treatment of Morgagni hernias with some reported advantages over abdominal surgery. This manuscript reports the authors' experience with childhood Morgagni hernias repaired via laparotomy.*

Subjects and Methods: *Records of five cases of Morgagni hernias were evaluated with respect to age, presentation, operative data, complications, and outcome.*

Results: *The average age of four male and one female patients was 34 months (range 6 months to 8 years). Predominant presenting symptoms were related to the respiratory system. The diagnoses were made by posterior-anterior and lateral chest X-rays and confirmed by barium enema contrast radiographs. Associated anomalies were detected in three cases. All cases were managed by abdominal approach through upper midline incisions reducing the herniated viscera (transverse colon in all and including omentum in one patient) and excising the hernia sac which was present in all patients. The postoperative period was uneventful in this series and no recurrence was detected in an average of four years of follow-up.*

Conclusion: *The transabdominal approach is appropriate in the surgical correction of paediatric Morgagni hernias.*

Tratamiento de las Hernias de Morgagni Mediante el Abordaje Transabdominal

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RESUMEN

Antecedentes: *Recientemente, se ha sugerido el empleo del abordaje torácico en el tratamiento de las hernias de Morgagni, reportándose algunas ventajas del mismo sobre la cirugía abdominal. Este trabajo reporta la experiencia de los autores en relación con hernias de Morgagni en la infancia, reparadas mediante laparotomía.*

Sujetos y métodos: *Las historias clínicas de cinco casos de hernias de Morgagni operadas en nuestro departamento, fueron evaluadas con respecto a edad, presentación, datos operatorios, complicaciones, y resultado.*

Resultados: *La edad promedio de cuatro pacientes varones y una hembra fue de 34 meses (rango de 6 meses a 8 años). Los síntomas presentados estuvieron relacionados de forma predominante con el sistema respiratorio. Los diagnósticos se hicieron mediante rayos X posterior-anterior y lateral de tórax, y confirmados luego mediante estudio radiográfico de contraste con enema de bario. Se detectaron anomalías asociadas en tres casos. Todos los casos fueron manejados mediante abordaje abdominal a través de incisiones de la línea media superior, reduciendo así la víscera herniada (colon transversal en todos, incluyendo el omento en un paciente) y practicando la excisión del saco de la hernia, presente en todos los pacientes. El período post-operatorio no presento incidentes en esta serie, y no se detectó recurrencia durante el seguimiento, que duró un promedio de cuatro años.*

Conclusión: *El abordaje transabdominal es apropiado en la corrección quirúrgica de las hernias pediátricas de Morgagni.*

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INTRODUCTION

Morgagni hernias (MH) are rare congenital defects of the retrosternal region, comprising only about 3% of all diaphragmatic hernias (1–3). They are thought to occur through a failure of fusion in the anterior part of the pleuroperitoneal membrane and deficiency in the muscularization process (2). These hernias are usually diagnosed in adults as isolated defects, contrary to the frequent associated anomalies in the paediatric age group (3–5). Once diagnosed, the treatment is surgical due to consideration of bowel strangulation (3). Various surgical approaches have been advocated ranging from open procedures to minimally invasive techniques. In this report, the authors' report their experience with the abdominal approach in the repair of Morgagni hernias in five children together with a discussion of symptoms, associated anomalies and outcome.

SUBJECTS AND METHODS

The data of five patients operated on between 1992 and 2003 were evaluated with regard to age, gender, presenting symptoms, associated anomalies, diagnostic methods, operative procedure, presence of hernia sac, herniated organ(s), complications and records of follow-up.

Operative technique involving an upper midline incision was done in each patient. Following reduction of the herniated organ(s), the hernia sac was excised and the anterior diaphragmatic defect was repaired by suturing the diaphragmatic edge to the under side of the posterior rectus sheath at the costal margin using nonabsorbable polypropylene interrupted sutures. Chest tube was not required in any of the patients.

RESULTS

The average age of four boys and one girl with MH was 34 months (range from 6 to 96 months at operation). The presenting symptoms were mainly respiratory in three (dyspnoea in two and persistent cough in one), gastrointestinal in one (recurrent abdominal pain) and cardiac in another patient (cyanosis in one patient with tetralogy of Fallot) as shown in Table 1. Associated anomalies were present in three patients, consisting of cardiac anomalies in two (one venticular septal defect and one tetralogy of Fallot) and oesophageal atresia with tracheosophageal fistula in one patient (Table 1). The diagnosis of MH in each patient was reached by postero-anterior chest radiograph demonstrating air-filled areas (superimposed on the cardiac shadow) which were of retrosternal location by lateral chest X-rays (Fig. 1). Barium enema radiographs revealed the herniated organ to be the colon in the five patients (Fig. 2). A further imaging study was not done in any of the patients except for one who was admitted with a chest CT performed at another medical centre. The presence of MH in the patient with oesophageal atresia-trachaeosophageal fistula was detected at age three months by postoperative follow-up chest radiograph. We were unable to detect the defect in this patient neither at thoracotomy done for fistula repair and oesophageal anastomosis nor was it revealed by early postoperative chest X-rays.

Table 1: Clinical features and operative findings of five patients with Morgagni hernias undergoing operation by the transabdominal approach.

Age (months) /sex	Symptoms	Diagnostic study	Associated anomalies	Hernia content	Hospital stay
36/M	Dyspnoea	Chest X-ray Barium enema	VSD	Colon	6 days
96/M	Cough Barium enema	Chest X-ray	–	Colon+omentum	5 days
12/F	Cyanosis Barium enema	Chest X-ray	Tetralogy of Fallot	Colon	8 days
6/M	Dyspnoea Barium enema	Chest X-ray	EA+TEF	Colon	6 days
21/M	Abdominal pain	Chest X-ray Barium enema Computed tomography	–	Colon	7 days

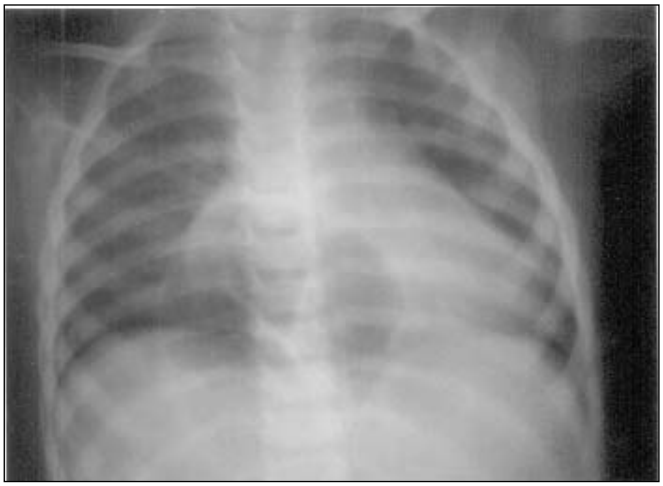

Fig. 1: Chest radiograph shows air-filled loop of bowel within the thorax.

At operation, the hernia in each patient was observed to be right-sided comprising the transverse colon. In one patient, major omentum was also herniated. Reductions were done easily, with no adherence to the hernia sac which was present in every case. The hernia sac was also excised in every patient and was free of adhesions. The mean hospitalization duration was 6.4 days (range 5–8 days) which was uneventful. No postoperative respiratory support was required. There was no recurrence during long term follow-up.

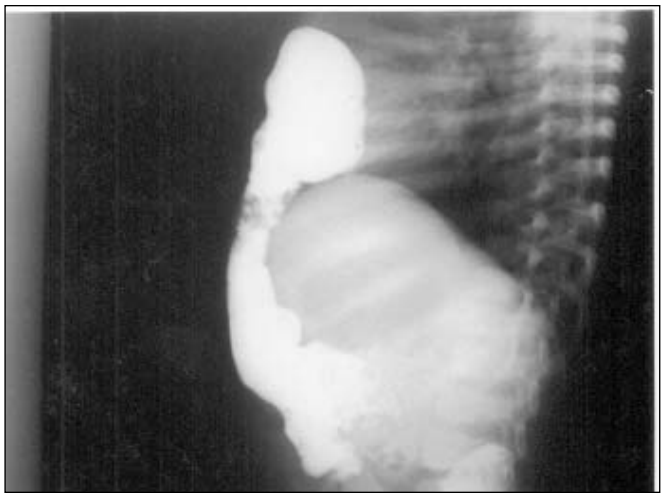

Fig. 2: Barium-contrast radiograph of the same patient shows the herniated transverse colon in the thorax.

DISCUSSION

Morgagni hernia has an incidence of 1%–6% of surgically repaired congenital diaphragmatic hernias (5, 6). Its incidence has been reported as 3% in a large series of 1750 cases and as 2.6% in 534 cases of diaphragmatic hernias (7–10). There were only five cases in 12 years from the reporting institution in this study and there was a male preponderance.

This defect occurs as a result of failure in the fusion of anterolateral diaphragmatic portions with the tranverse septum (11). Usually located on the right side, the defect could occur on the left in approximately 2% of cases and bilateral in 8% (6, 7, 12). All the defects in the present series were right-sided.

Symptoms have been predominantly respiratory especially in children in the reported series (1). In a report, 7 out of 11 paediatric patients presented with respiratory complaints whereas one had gastrointestinal symptoms and 2 were asymptomatic (13). Three patients in the present series had respiratory problems and one had gastrointestinal symptoms. One of our patients with tetralogy of Fallot had MH diagnosed during evaluation for cyanosis.

Although a wide range of anomalies associated with MH have been described, most of them consist of cardiac defects, up to 80% in some series (9). Two patients in the present study had associated cardiac anomalies and one had oesophageal atresia with tracheoesophageal fistula (EA-TEF). We were not able to find a report on association of EA-TEF with MH in the literature and this patient probably represents the first reported case.

The diagnosis in these cases were reached with the aid of postero-anterior and lateral chest X-rays and confirmed with barium enemas (2,14). There are various suggestions in the literature on the diagnostic methods for MH. In our patients, confirmation by barium enema sufficed for the diagnosis and this observation is consistent with another (15).

It is undisputed that surgical repair is mandatory in the treatment of MH to prevent possible complications of incarceration and strangulation (6,16). However, surgical approaches have varied widely in the reports, including thoracic and abdominal procedures with open or minimally invasive techniques (1, 6, 7, 17). The hernias in the present series were all repaired by transabdominal approach. The reduction of the herniated organs did not pose a problem at all and we did not encounter any adhesions of the hernia sac with intrathoracic membranous structures such as pleura and pericardium mentioned in other reports. Recently, there have been suggestions on the transthoracic approach, mainly with regard to adhesions between the sac and other structures (1, 4,15). It should be noted that complete removal of the hernia sac is not mandatory and partial excision in unfeasible situations have been applied with no postoperative problems in a report on transabdominal minimally invasive repair of diaphragmatic defects (13). However, this suggestion should be considered cautiously due to a number of drawbacks. The defect should not be bilateral which would not be easy to document preoperatively. Intestinal malrotation should be absent as should strangulation which would pose a serious problem with the thoracic approach and which are not rare in patients with MH (16). The morbidity of the thoracotomy and requirement of chest-tube drainage for some time should also be considered. In this series, there was no problem with postoperative lung expansion.

The authors, therefore, conclude that the classical abdominal approach using a small midline incision is a very effective and feasible treatment modality for MH. It provides the surgeon with the ability to correct associated abdominal malformations and complications with good results and with no recurrence in long-term follow-up.

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