Transthoracic Approach with Anterior Mini Thoracotomy in Surgical Treatment of Foramen of Morgagni Hernia

Morgagni Hernisi Cerrahi Tedavisinde Anterior Mini Torakotomi Yoluyla Transtorasik Yaklaşım

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SUMMARY

Foramen of Morgagni hernia is a rare type of congenital diaphragmatic hernias which occurs through anteromedial defect in the diaphragma. Several approaches are available for repairing foramen of Morgagni hernia and the significance of laparatomy has been particularly emphasized as an operative technique. In this paper present our experience on patients with foramen of Morgagni hernia operated via transthoracic approach with anterior mini thoracotomy in our department.

Between January 2002 and May 2005, six patients with suspicion of foramen of Morgagni hernia were operated via transthoracic approach in our department. Patients ages ranged from 23 to 67 years (mean 49.5). Five patients did not have definitive diagnosis preoperatively. One patient was diagnosed as Morgagni hernia before the operation and had some additional pulmonary complications. Five patients were female and one patient was male. The presenting symptoms were dyspnea (n=4), chest pain (n=2) and gastrointestinal discomfort (n=1). One patient did not have any symptoms. Right anterior mini thoracotomy was performed in all patients.

Hernia sac was present in all cases. Exploration revealed omentum in hernia sac in five patients; colon and omentum in one patient. The mean duration of chest tubes was 2 days (1-3) after the operation. All patients had an uneventful postoperative recovery. No recurrence occured in the 1-3 year follow-up period.

Anterior mini thoracotomy is a safe and effective way for primary repairment of the foramen of Morgagni hernia when trans-thoracic approach preferred.

KEY WORDS: *Foramen of Morgagni hernia, Thoracotomy*

ÖZET

Morgagni hernisi, diafragmadaki anteromedial defekt yoluyla oluşan nadir bir tip konjenital diafragma hernisidir. Bu herninin cerrahi yolla tamirinde çeşitli yaklaşımlar mümkün olmakla birlikte, operatif teknik olarak laparotomi ön plandadır. Bu çalışmada, kliniğimizde, anterior mini torakotomi yoluyla transtorasik yaklaşım uygulanan Morgagni hernili hastalar ile ilgili tecrübelerimiz sunulmuştur.

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Ocak 2002 ile Mayıs 2005 tarihleri arasında, Morgagni hernisi ön tanılı 6 hasta transtorasik yaklaşım yoluyla opere edildi. Hastaların yaşları 23 ile 67 arasında değişmekte olup (ortalama 49,5), beşi kadın biri erkek idi.Beş hastada, preoperatif dönemde kesin tanı konamamıştı. Diğer hastada ise, preoperatif dönemde Morgagni hernisi tanısı konmuş olmakla birlikte, hastada bazı ek pulmoner komplikasyonlar mevcuttu. Semptomlar, dispne (n=4), göğüste ağrı (n=2) ve gastrointestinal rahatsızlık (n=1) idi. Bir hasta ise asemptomatikti. Tüm hastalara sağ anterior mini torakotomi ile yaklaşıldı.

Bir herni kesesi, tüm hastalarda mevcuttu. Herni kesesi içeriği, beş hastada omentum, bir hastada ise kolon ve omentum idi. Göğüs tüplerinin ortalama kalış süresi, operasyondan sonra iki gün (1-3 gün) olarak bulundu. Postoperatif dönem tüm hastalarda sorunsuz geçti. 1-3 yıllık takiplerinde hiçbir hastada rekürrens ile karşılaşılmadı.

Trans-torasik yolla tedavi gerektiren Morgagni hernilerinde primer tamir için anterior mini torakotomi yaklaşımı güvenli ve etkili bir yoldur.

Anahtar Kelimeler: *Morgagni hernisi, Torakotomi*

Introduction

Foramen of Morgagni hernia is the herniation of abdominal tissues and organs through the diaphragmatic triangular space named as Morgagni or Larrey space, which occurs when the costal and sternal fibrotendinous components of the diaphragma fail to fuse.[1] The incidence of foramen of Morgagni hernia in all the diaphragmatic hernias is rare and reported as 3-5% in some large series.[2,3] Although the defect is congenital, it's frequently diagnosed in adult ages. Patients are generally asymptomatic during their first years of life.[1-3] Although only observation was recommended by some authors for asymptomatic patients, due to the risks of life threatening complications like strangulation or incarseration, the most preferred way is treatment of the defect as soon as the diagnosis is established. For repairment of foramen of Morgagni hernias, several surgical procedures have been described and, particularly the significance of laparatomy has been emphasized as an operative technique.[1] Since the defect is between the thoracic and abdominal cavities, both transabdominal or transthoracic approaches can and have been utilized.

In this paper we aimed to present our experience in transthoracic approach with anterior mini thoracotomy in the treatment of hernias of foramen of Morgagni.

Patients and Methods

The records of the patients operated with the diagnosis of foramen of Morgagni hernia via transthoracic approach between January 2002 and May 2005 were revieved. Age, sex and presenting symptoms of the patients and also the diagnostic procedures utilized and the surgical outcome.

A total of six patients had surgical repair of the defect via anterior mini thoracotomy. Their ages ranged from 23 to 67 years (mean 49.5). Five patients were female, and one patient was male. Defect was found right sided in all the patients. One of the cases was asymptomatic; and was diagnosed incidentally with chest radiographs. In symptomatic cases, the most common presenting symptom was mild dyspnea (n=4), followed by slight chest pain (n=2) and gastrointestinal discomfort (n=1). Down syndrome and scoliosis were determined in one patient each. There was no significant trauma history in any of the patients.

The diagnostic tools utilized included plain chest and abdominal x-rays and computed tomography (CT) of the thorax. Findings on posterior-anterior and lateral chest radiographs include poorly demarcated opacity in the right cardiophrenic recess in five patients (Figure 1/A-B) and air-fluid level in the retrosternal region in one. Thoracic CT, performed in all of the cases, demonstrated fat density in the right pericardial region in five cases (Figure1/C) and loops of colon in one patient. Additionally pleuro-parenchymal fibrous bands near lesion in four and compression atelectasis with tubular bronchiectasis in two patients were determined. Bronchoscopy was performed in three patients for differential diagnosis.

Preoperative precise diagnosis was established in only one patient although all the non-invasive diagnostic tests were made. Other five patients were operated for undiagnosed mass at right cardiophrenic angle.

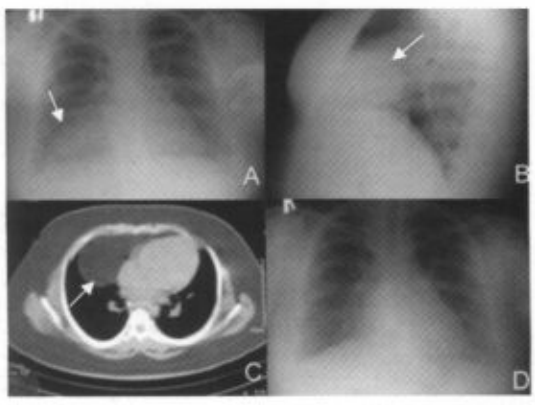

Figure 1.
The fat tissue seen in the right cardiophrenic recess (white arrows) in the preoperative X-rays (A, B, C) was disappeared in the postoperative X-ray (D).

Operative procedure

In all cases, the defect was repaired via transthoracic approach. Right anterior (submammarian) mini thoracotomy incision through the 6th intercostal space was performed at left oblique decubitus position. The adhesions of the hernial sac with the surrounding tissues were released with blunt and sharp dissections, followed by incising the hernial sac, identifying (Figure 2) and replacing the contents back into the abdominal cavity. In cases which reduction was hindered, partial omentectomy was performed. Finally, the diaphragmatic defect was repaired using interrupted 1(0) silk or polypropylene sutures. Once the defect was repaired, the suturing area was reinforced by anchoring the sutures through neighboring thoracic wall. This procedure was carried out by anchoring the same sutures used in primary closure, to the parasternal intercostal muscle bundles. Thus, the defective area was supported by adjacent thoracic wall. We did not need to use any prosthetic material.

Analgesia was obtained by using parenteral diclophenac sodium 75 mg once a day and, if needed, pethidine HCl 50 mg, three times a day for the first 24 hours and per-oral diclophenac potassium 50 mg, three times a day until the 7th day after the operation.

All patients were followed up regularly at every 6th month by radiographic tools.

Results

Anterior mini thoracotomy provided excellent exposure and we didn't need to advance the incision in any of the patients. Hernia sac was present in all cases. The contents of the hernia sac included omentum in five patients and omentum with transverse colon in the other patient. Partial omentectomy was performed in 5 cases in which omentum could not be reduced. In the remainder, abdominal contents and omentum could have been reduced back to the abdominal cavity. Primary repairment was done in all the patients. All fields of the lungs were observed fully expanded after the repairment was done.

Postoperative period was uneventful in all of the patients. Totally six doses of pethidine were needed in all of the patients (one time in each patient at average). Postoperative morbidity or mortality was not observed. Mean duration of the chest tubes was 2 days (1-3) and mean hospitalization time was calculated as 5 days. No recurrence was encountered within the mean 21 months (12-36) follow-up.

Discussion

Hernias of foramen of Morgagni occurring through congenital defect of the diaphragma are rarely seen. Hernia generally occurs right sided, with a true sac which contains omentum, as in our series.

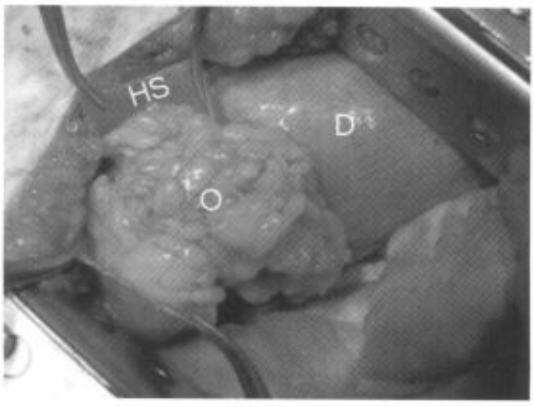

Figure 2.
The appearence of the omental fat tissue in the hernia sac.
O: Omental fat
D: Diaphragma
HS: Hernia sac

Chest X-rays, barium enema, CT and magnetic resonance imaging (MRI) are used in the diagnosis.[3-6] CT is quite useful in establishing the diagnosis of the foramen of Morgagni hernia.[4,6] CT shows thin linear densities originating from the omental vessels, wide paracardiac fat density and abnormally highly-localized transverse colon. Differential diagnosis should be made between pleuropericardial cyst, lipoma, liposarcoma, mesothelioma, pericardial fat mass, diaphragmatic cysts and tumours, thymoma and anterior chest wall tumours.[3-6] Therefore, surgery may be needed for precise diagnosis as five patients of our series. Additionally, although symptoms of the patients having foramen of Morgagni hernia are generally silent, immediate surgical repair is recommended due to risk of life threatening complications like incarceration or strangulation of abdominal viscera.[1]

For surgical repair routine approach is transabdominal.[1,3] In our country, treatment of hernia of foramen of Morgagni usually has been performed by general surgery clinics. Rarely cases are referred to thoracic surgery clinics if thoracic masses are not excluded in differential diagnosis or if additional thoracic pathologies are suspected as the patients included in our study. Transthoracic approach is also recommended for some cases by some authors.[1,4,7] Sirmali et al proposed that especially in obese and elderly patients who did not previously have laparotomy, transthoracic approach should be preferred if there are no signs of strangulation or incarceration of the abdominal viscera and if the defect is not bilateral.[4] We additionally recommend transthoracic approach in risk of presence of another intrathoracic pathology or risk of presence of intrathoracic adhesions (in elder patients) or need for evaluating compressed lung parenchyma. We preferred anterior mini thoracotomy for transthoracic approach, and this approach proved excellent exposure of sac of the hernia, foramen of Mor-

gagni, sternum and costal cartilages. Other advantages of this incision when compared with posterolateral thoracotomy are less discomfort and less need for narcotic analgesics possibly due to less muscle dividing, lower morbidity rate possibly due to less pain and better aesthetic appearance due to shorter and submammarian incision.

Recently, there are case reports of both thoracoscopic and laparoscopic surgical repair of foramen of Morgagni hernias employing primary closure and patch repair techniques with successful long-term outcomes.[3,8,9] Although thoracoscopic surgical repair requires more experience compared to the traditional transthoracic approach, this procedure might replace transthoracic approach in the future.

As a conclusion, when a patient with suspicion of Morgagni Hernia who needs trans-thoracic approach, anterior mini thoracotomy can be used as a safe and effective method with good exposure potential and well tolerability.

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