

Traumatic Diaphragmatic Rupture through the Central Tendon with Herniation of the Stomach and Coils of Small Bowel into the Pericardial Cavity

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ABSTRACT

Traumatic diaphragmatic rupture through the central tendon with herniation of the stomach and coils of small bowel into the pericardial cavity.

METHOD: Case note of a patient managed for traumatic diaphragmatic rupture through the central tendon with herniation of the stomach and coils of small bowel into the pericardial cavity was used with a review of relevant literature.

SUMMARY

A 49-year old civil engineer who presented with 2-year history of easy fatigability and palpitations as well as a 6-month history of hypertension and was initially managed as a case dilated cardiomyopathy to rule out incipient CCF secondary to hypertension, was evaluated and found to have chronic diaphragmatic hernia through the central tendon with evisceration of the stomach and coils of the small bowel into the pericardial cavity. Though there was history of motor vehicle crash preceding the development of the symptoms, but the long history of effort dyspnoea and palpitations added to enlarged cardiac silhouette on posterior anterior chest x-ray, a diagnostic challenge was posed which was resolved by thoracoabdominal CT scan. Patient had left sided posterolateral thoracotomy via 7th intercostal space followed with reduction of the stomach and coils of small bowel after careful adhesiolysis and repair of the defect in double layers.

CONCLUSION: High index of suspicion is very important in the diagnosis of diaphragmatic central tendon injury considering the rarity of the injury and diagnostic challenges it poses in chronic form. However, where the facilities are available, CT scan and 2-D echo will most of the time clinch the diagnosis; also is upper gastrointestinal series

KEYWORDS: central tendon of the diaphragm, pericardial cavity, CTscan and 2-D Echo.

INTRODUCTION

Traumatic diaphragmatic hernia is one of the common complications of blunt and penetrating injuries. The anatomic location of diaphragmatic injuries appears to be more common on the left side. The liver affords some degree of protection to laceration of the diaphragm on the right side. Bilateral injuries to the diaphragm reportedly occurs in 2% of all patients sustaining diaphragmatic trauma. Tears of the central tendon of the diaphragm with herniation of abdominal contents into the pericardium are uncommon. Indeed, it is the rarest form of traumatic diaphragmatic hernia in the adult. Only 28 cases have been reported in the literature.

Indirect blunt trauma has been implicated in most cases, but one resulted from a stab wound to the anterior chest. Patient may present immediately or after some years following trauma with symptoms of intermittent bowel obstruction, including dyspnoea, palpitations or features of cardiac tamponade. Physical findings included bowel sounds in the chest, decreased heart and lung sounds and absent point of maximal cardiac impulse. CXR usually revealed supradiaphragmatic gas shadow suggestive of bowel in the chest. Thorough examination of both AP and lateral CXR and upper gastrointestinal series may positive diagnosis of anterior diaphragmatic hernia and fluoroscopy after induced pneumomediastinum may establish pericardial involvement. Thoracotomy is the preferred approach to surgical repair of intrapericardial hernia. Since the symptoms referable to adult intrapericardial hernia can be life threatening incapacitating, herniorrhaphy should performed promptly upon diagnosis with expectation of an uneventful recovery and negligible recurrence rate.

CASE REPORT

M. O. Is a 49-year old civil engineer referred to UNTH MOP by a physician based in Umuahia. His problem dated back to 2-year history prior to presentation when he was involved in a near fatal accident in which he sustained multiple injuries. He was managed initially at a private hospital in Kaduna and later in Umuahia. He recovered well but later developed easy fatigability and recurrent nausea. The nausea was worse in the morning, followed occasionally by vomiting. The vomitus was scanty in quantity, almost always unaltered. There was associated dysphagia as he felt food stick to his chest during swallowing. There was associated easy satiety and postprandial abdominal discomfort but no heart burn. There was associated dyspnoea on moderate exertion but no orthopnoea or paroxysmal nocturnal dyspnoea. However, a patient feels gurgling sensation in the chest, more on the left side than when he is recumbent. He was incidentally found to have developed hypertension for which he was managed with drugs. For the above symptoms, he went to several hospitals before referral to UNTH MOP.

Clinical examination revealed that apex beat was found 2 cm medial to the midclavicular line in the 5th left intercostals space. Heart sound was distant. The breath sound was vesicular bilaterally but markedly reduced in the left hemithorax.

CXR (PA-view) revealed enlarged cardiac silhouette

and upper lobe diversion, concluding with a working diagnosis of incipient heart failure due to hypertension to rule out dilated cardiomyopathy. 2-D echocardiography requested was not done due to prolonged booking. However, CT scan (enhanced and non-enhanced thoraco-abdominal scan, 5mm thick slices with reformatted images in normal and sagittal views) revealed in the middle mediastinum, marked deviation of the heart to the right hemithorax, caused by coils of small bowel filled by barium contrast as well as distended stomach filled with fluid. The hernia neck is seen anteromedially and measures 6-8 cm in diameter. At this juncture, patient was referred to cardiothoracic surgical unit. After adequate counselling and ancillary work up, he was offered left sided posterolateral thoracotomy via 7th intercostals space. *Intra-operative* findings were as follows: marked adhesion between the visceral and parietal pleura over the left hemidiaphragm, with the lung compressed to the mediastinum. Central diaphragmatic hernia through the central tendon into the pericardial cavity, a defect approximately 10 cm in transverse diameter with thickened edges. Hernia content consisted of stomach, omentum, and tip of the left lobe of the liver and marked adhesion between the omentum and the anterolateral border of the defect; stretched and thinned diaphragm around the defect. The mediastinum and the heart were displaced towards the right hemi-thorax. Operation: the pericardium was incised over the lateral border, adhesiolysis affected between the sac and the contents. Contents were reduced into the peritoneal cavity and the neck closed continuously with 2-nylon. Pericardial rent was repaired with interrupted chromic 2-0. Left lung fully inflated and left tube thoracostomy effected and wound closed in layers after adequate haemostasis and intercostals nerve block. Nasogastric tube passed to keep the abdomen deflated. Patient made uneventful recovery and resolution of preoperative symptoms and was discharged on the 10th postoperative day. Follow up at the surgical out patient on 3 different occasions has been satisfactory.

DISCUSSION

Rupture of the tendinous centre of the diaphragm and pericardium after blunt chest trauma represents a rare consequence of series of thoracic trauma. Typically, the diagnosis is established intraoperatively during resuscitation or surgery for the associated injuries or at autopsy. It accounts for about 1 % of all diaphragmatic rupture. The rupture is usually long and transverse. However, the gradual herniation of the stomach, transverse colon, and omentum causes relatively lesser symptoms which becomes evident only months or years

later. Symptoms of chronically herniating organs in the pericardium are less dramatic compared to accumulation of fluid in the pericardium. In the acute setting if pericardium rupture is not recognized and treated promptly, it could be fatal owing to cardiac herniation.

In our case, the heart was pushed to the right to give space to the invading abdominal contents, precisely the stomach and the coils of small bowel. Patient had symptoms but was not fortunate early enough to see a cardiologist or cardiothoracic surgeon for the duration of 2-years.

In conclusion, delay cases of diaphragmatic hernia are classically approached through the thorax because of the presence of dense adhesions between abdominal viscera and thoracic structures. Early surgical repair either conventionally or by minimal access surgery is necessary in order to avoid the long term sequelae of herniation such as gastrointestinal obstruction, perforation, strangulation or even adhesion similar to the one we have in this case. CT scan can provide clues for diagnosis of intrapericardial transdiaphragmatic hernia.

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