

Incidental Asymptomatic Diaphragmatic Hernia in An Adult At Postmortem: - A Report of A Case and Literature Review

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Abstract Diaphragmatic hernia in the absence of trauma is very rare in adults. Congenital diaphragmatic hernia is a major malformation and a relatively common condition found in babies. We present an incidental asymptomatic diaphragmatic hernia found in a middle age man brought for medico-legal autopsy. He was brought in dead with a gunshot wound to the right anterolateral aspect of the neck. With a complex embryological story, congenital abnormalities of the diaphragm are unusual but far more common are the acquired hernia. We discuss the index case and other causes of diaphragmatic hernia.

Keywords: *autopsy, diaphragm, hernia, incidental*

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1. Introduction

Diaphragmatic hernia which represents a defect or hole in the diaphragm allowing the abdominal contents to move into the chest cavity, in the absence of trauma is very rare in adults (1). Congenital diaphragmatic hernia is a major malformation occasionally found in newborns and babies. It is a relatively common condition that occurs in less than one to five babies 1000 births [2] to one in 4000 live births [3,4]. It seems to be slightly more frequent in men and less frequent in blacks [5,6]. Prenatal ultrasonography demonstrates herniation of the bowel or liver into the thorax and permits prenatal diagnosis in 50% to 90% of cases [7].

Adult onset diaphragmatic hernia is a rare condition with variable clinical manifestation [8]. The majority of adult onset diaphragmatic hernia is associated with trauma or penetrating injury [8,9,10,11], with only a few reported cases not involving the type of obvious damage or injury. [3,12]. Blunt thoracic and abdominal trauma are associated with a 5% to 7% incidence of diaphragmatic injury and in 3% to 15% for those with penetrating injury [8]. These injuries may occur and be left unrecognized but often uncovered months later during work up for related symptoms.

In this reports, we describe the case of an incidental asymptomatic diaphragmatic hernia in a patient that presented at autopsy following a gunshot wound to the neck. Patient had no known history of trauma or a penetrating wound of the chest. Autopsy showed a through and through perforation of the presenting bowel content in the thorax cavity.

2. Case-report

A middle age man was found inside a street gutter lying supine by the side of a busy road. A medico-legal autopsy was requested to determine the cause and manner of death. The body measured 185 cm and weighed approximately 80 kg. External examination revealed a gunshot entry wound at the right anterolateral aspect of the neck with hematoma at the right anterolateral aspect of the neck with neck dissections. No lacerations of the neck great vessels were noted. There was fractured C3-C5 vertebra. Thoracic dissection demonstrated severe and extensive laceration of upper segment of the left lung (posteriorly) with approximately 2.0 liters of hemothorax. There was a diaphragmatic hernia (Figure 1 - Figure 3) through weakened and widened esophagus hiatus. The stomach cardiac remains in its normal position with an intact

cardio-esophageal junction, but the fundus of the stomach herniated through the hiatus. There was a through and through perforation of the herniated stomach (Figure 2) fundus with soiling of the left thoracic cavity (Figure 1) with food particles in the process of digestion. The liver looked pale with the kidneys showing evidence of shock. There was an exist wound at the level of 9th-10th ribs, left anterolateral space. Based upon the macroscopic observation, the principal cause of death was recorded as perforating gunshot wound to the neck (Rt), skeletal (C3-C5) fracture, extensive left upper lung laceration with hemothorax and perforated hiatus hernia viscus (stomach fundus). The mechanism of death was hemorrhagic shock and was ruled as homicide. A retrospective review of his case-record and discussion with his family physician revealed no history suggestive of either a symptomatic hiatus hernia or past trauma to the chest.



Figure 1. Soiling of the thoracic cavity by partially digested food from the perforated hiatus hernia viscus (stomach fundus)



Figure 2. Through and through perforation of the herniated stomach fundus



Figure 3. Herniation of the stomach fundus through the hiatus in the diaphragm. The liver is below the diaphragm

3. Discussion

The irony of the complex embryological story of the diaphragm is that congenital abnormalities of the diaphragm are unusual [13]. Far more common are the acquired hiatus hernia subdivided into sliding and rolling hernia.

These are found in patients usually of middle age where weakening and widening of the esophageal hiatus has occurred [13]. Our index patient was a middle age man and autopsy shows weakened and widened esophageal hiatus. The presentation is that of rolling hernia also called para-oesophageal hernia as the cardiac remains in its normal position with an intact cardio-esophageal junction with the rolling of the stomach fundus through the hiatus in front of the esophagus [13]. Our patient remained asymptomatic throughout his lifetime but para-esophageal hernia may present with epigastric discomfort, flatulence and even dysphagia.

The most frequent cause of diaphragmatic herniation of abdominal viscera in adults seems to be trauma, whereas in babies or newborns, it is most attributable to congenital absence or defective fusion of the septum transversum or the pleuroperitoneal membrane [1,8,13]. Acquired diaphragmatic hernias may arise from penetrating or blunt trauma, or may be iatrogenic [14]. It may present immediately after the injury or after a delay, sometimes of many years. Severe blunt trauma to the trunk is associated with diaphragmatic rupture in about 5% of cases [15,16]. These patients frequently have other injuries, including intracranial hematomas (25%), fractures of the pelvis (25%) and long bones (50%) and injuries to intra-abdominal viscera (50%) and injuries to the heart and great vessels (10%). Ribs fractures are not universal with a reported incidence of 47% in a large series [14,17-22]. The usual mechanism of injury is thought to be compression of the abdomen, with fracture of the diaphragm under the increased pressure but occasionally the diaphragm may be torn by direct trauma from fractured ribs [14]. In this reported case, there was no previous recorded trauma and even at autopsy no fractured rib was seen.

Congenital diaphragmatic hernia (CDH) is an idiopathic human malformation that usually presents in the newborn period [7]. CDH represents a displacement of the abdominal organs into the thoracic cavity through a weak area or a distinct defect in the diaphragm. The most frequent types of CDH are the left posterolateral (Bochdalek hernia) and the sternocostal (Morgagni hernia) type. Bochdalek hernia, which result from inadequate closure of posterolateral pleuroperitoneal membrane is the most seen congenital diaphragmatic hernia [23] with majority presenting during neonatal life and have a poor prognosis, being associated with congenital pulmonary abnormalities [24,25]. In adult life, they remain largely asymptomatic and are usually incidental findings on chest radiographs or computerized tomography [26]. Foramen of Morgagni hernias are rare diaphragmatic hernias usually occurring on the right and located in the anterior mediastinum. In adults, trauma, weight lifting or other causes of increased intra-abdominal pressure.

Management of diaphragmatic hernia depend on high index of suspicion in any patient with major trauma to the trunk, especially with fractured ribs or basal shadowing on

the chest X-ray or presence of a gas filled issues in left chest which is diagnostic [15]. In a stable patient, ultrasound or CT may provide additional useful information. When the diagnosis is confirmed, the preferred operative approach is through a laparotomy. This enables a thorough inspection of the abdominal contents [14,22,27,28]. For a more stable patient with delayed diagnosis, adhesions, may develop rapidly in the chest and may form within a few days of injuries, these necessitating thoracotomy as the approach of choice when diagnosis is delayed [14].

Our index patient presented at autopsy as an incident finding. Acquired hernias may present as acute surgical emergency to chronic poorly defined disorder. The surgeon should have this as one of his diagnoses especially in patient with history of major trauma to the trunk.

4. Conclusion

Despite the complexity of its embryology, congenital abnormalities of the diaphragm are unusual. We have presented a case of acquired hiatus, rolling hernia that was an incidental autopsy finding in a middle age asymptomatic adult. Acquired diaphragmatic hernias arising from penetrating or blunt trauma are more common. The congenital diaphragmatic hernias are probably caused by disturbed molecular signaling during organogenesis and are associated with congenital pulmonary abnormalities.

Good management which includes early detections and repair reduces mortality and morbidity.

Conflicts of Interest

The authors declare there are no conflicts of interest.

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