

TRAUMATIC RUPTURE OF THE DIAPHRAGM



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Traumatic diaphragm rupture is a condition associated with high rates of mortality and morbidity, which can be a result of penetrating or less commonly blunt thoracoabdominal injury. These cases may present as acute or chronic cases in our clinical practice. The majority of affected patients are men (90-95%). Blunt traumas, that can cause diaphragm rupture, are motor vehicle accidents, falls and crash injuries, whereas penetrating injuries most often caused by stabbing or gunshot wounds. The incidence of traumatic diaphragm rupture ranges from 0.36% to 3% [1]. If a diaphragmatic injury is initially overlooked, or when detected in the post-discharge period, level of herniation into the thoracic cavity tends to be greater. The physical exam should start with airway, breathing and circulation (ABC), but some specific indications. Although the detection of diaphragmatic rupture is very important at the initial examination, almost 70% of the cases are missed[2]. Clinical presentation may differ at various levels on admission to the emergency department as from asymptomatic cases to serious respiratory or gastrointestinal symptoms [3]. It is often difficult to diagnose and can be detected with the suspicion of the physician admitting the patient in the emergency room.

BLUNT DIAPHRAGMATIC INJURIES

The two most common type of trauma responsible for blunt diaphragmatic injuries are car crashes, motorcycle or cultivator collisions, work related accidents, and fall from a great height. Sudden and excessive increase of intra-abdominal pressure in blunt trauma constitutes the pathophysiological mechanism that causes diaphragmatic injury. Due to this transdiaphragmatic pressure gradient causing the central tendon tearing up may result with greater defect than penetrating trauma [4]. The abdominal organs that commonly herniate into the thorax are the stomach, spleen, colon, small bowel and liver. The left diaphragm is injured most frequently due to the left posterolateral membrane in the weakest portion of the diaphragm. The pleuro-peritoneal membranous structure of left posterolateral part is the cause of avulsion and burst damage and is rather more often than the right side in comparison. The right diaphragm is stronger congenitally and protected by the liver. The diagnostic radiology can start with a simple chest X-Ray but the 'gold standard' technique is chest computed tomography (CT) and since the patient admitted to emergency department, commonly the first radiologic approach is to be CT in order not to waste time.

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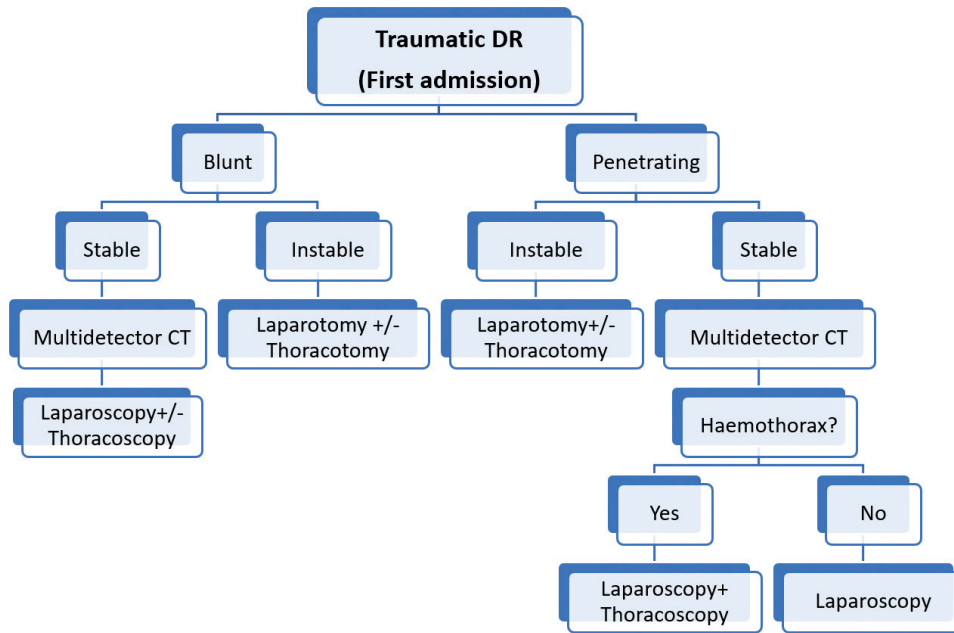


Figure 6: Algorithm for Acute Traumatic Rupture of the Diaphragm

ed [13]. In cases where primary repair is not sufficient, polytetrafluoroethylene, polyethylene terephthalate, and polypropylene mesh are generally used. Patch infection followed by hernia recurrence is also reported in the literature [13].

CHRONIC DIAPHRAGMATIC HERNIA

Late diagnosis for diaphragmatic rupture refers the time of 3 months to 40 years (AN). Especially small defects of the diaphragm not presenting with hernia at the time of admission right after the trauma, may reapply with various symptoms later on. The possibility of missed diagnosis is higher in cases with blunt trauma compared to penetrating injuries. The penetrating trauma causes a smaller defect (<2 cm) and it is more likely to be occult and frequently result in delayed diagnosis. If no hernia occurred at the time of admission to emergency room and conservative follow-up and no surgery for exploring was performed, the case is likely to be missed. [14]. The common symptoms for delayed diaphragmatic hernia are chest pain and progressive shortness of breath. Visceral obstruction or strangulation

may be the late complications can cause hemodynamic deterioration and may result in organ resection. The approach in chronic diaphragmatic hernia is usually laparotomy and thoracotomy. Thoracotomy alone will not be sufficient to remove all eviscerated abdominal organs from the thoracic cavity and replace them into the abdomen, so it should be combined with a laparotomy. Reconstruction with mesh is required in almost all procedures in chronic cases. [15].

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