

Travmatik Penetran Diyafram Rüptürlü Yirmidört Hastanın Retrospektif Analizi

Retrospective Analysis of Twenty-four Patients with Traumatic Penetrating Diaphragmatic Ruptures

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Özet

AMAÇ: Travmatik penetran diyafram rüptürleri (TPDR) klinik ve radyolojik olarak tanısı zor konulabilen yüksek morbidite ve mortalite ile seyredilebilen nadir bir durumdur. Bu çalışmanın amacı, 6 yıllık vakalarımızın retrospektif analizinden çıkan verilerle travmatik penetran diyafram rüptürleri konusunda deneyimlerimizi literatür eşliğinde değerlendirmektir.

YÖNTEMLER: Çalışmamızda Aralık 2008 ile Şubat 2015 tarihleri arasında kliniğimizde TPDR tanısı ile tedavi edilen 3'ü kadın, 21'i erkek toplam 24 hastanın verileri retrospektif olarak tarandı. Hastaların yaş, cinsiyet, yaralanmanın yeri ve çapı, eşlik eden diğer organ yaralanmaları, uygulanan cerrahi prosedürler, hastanede kalış süresi ve mortalite yönünden değerlendirildi.

BULGULAR: Toplam 24 hastanın 21'i erkek ve 3'ü kadındı. Yaş ortalaması 36,6±7,2 (19-66) idi. On yedi hastada kesici delici alet yaralanması, 2 hastada ateşli silah yaralanması ve 4 hastada iatrojenik penetran diafram yaralanması mevcuttu. Yaralanmaların yerleşim yeri 20 hastada solda, 3 hastada ise sağda ve 1 hastada bilateraldi. Yaralanma boyutu ise 2.0±0.8 (0,5-10) cm idi. Operasyona alınan hastaların 3'ü laparoskopik olarak geriye kalan 21'i açık olarak ameliyat edildi. Eşlik eden diğer organ yaralanmaları açısından; 8 dalak, 3 karaciğer, 2 akciğer, 5 mide, 3 transvers kolon, 2 sigmoid kolon, 5 ince barsak, 2 pankreas ve 1 aort yaralanması mevcuttu. Hastanede kalış süresi ortalama 10.2±3.8 (1-36) gündü. Eşlik eden organ yaralanmaları ve hemorajik şok nedeniyle 1 hasta intraoperatif diğeri postoperatif dönemde exitus oldu. Toplam mortalite sayısı 2 idi.

SONUÇ: Acil şartlarda TPDR tanısı klinik ve radyolojik olarak konulamayan vakalarda operasyonda toraks ve karın boşluğundaki organ yaralanmaları ile birlikte diyafram yaralanmaları da akılda bulundurulmalı ve rutin eksplorasyonu cerrahlar tarafından ihmal edilmemelidir.

Anahtar Kelimeler: Travma, diyafram, penetran, rüptür

Abstract

OBJECTIVE: Traumatic penetrating diaphragmatic rupture (TPDR) is a rare condition that can be hardly diagnosed clinically and radiologically and associated with high morbidity and mortality. The purpose of this study was to evaluate our experience of 6 years on TPDR of our retrospective analysis with the literature.

METHODS: Between December 2008 and February 2015, 24 patients of 3 women and 21 men with TPDR were retrospectively analysed. Age, gender, location and diameter of injury, accompanied other organ injuries, surgical procedures, length of hospital stay and mortality were evaluated.

RESULTS: A total of 24 patients, 21 women and 3 men. The mean age was 36.6±7.2(19-66)years. There were seventeen patients with penetrating stab wounds, 2 with gunshot wounds and 4 with iatrogenic diaphragm injury. The injury was settled at left on 20 patients, at right on 3 and bilaterally on 1 patient. The injury size was 2.0±0.8(0.5-10)cm. The 3 patients were operated laparoscopically, the remainder 21 with open procedure. Concomitant organs injuries; 8 spleen, 3 liver, 2 lung, 5 stomach, 3 transverse colon, 2 sigmoid colon, 5 small intestine, 1 pancreas and 1 aorta. Length of hospital stay was 10.2±3.8(1-36)days. Because of accompanying injury and hemorrhagic shock 1 patient intraoperatively and 1 postoperatively died. Total mortality was 2.

CONCLUSION: At emergency TPDR in cases of undiagnosed with clinical and radiological conditions, presence of the diaphragm injuries with the thorax and abdominal organ injuries should be kept in mind and routine exploration should not be neglected by the surgeon.

Keywords: Trauma, diaphragm, penetrating, rupture

INTRODUCTION

Penetrating traumatic diaphragmatic rupture is a rare condition occurs in approximately 10-15% of the penetrating chest trauma (1). Penetrating trauma injuries can be occurred iatrogenic (2). Although the delayed diagnosis of traumatic diaphragmatic rupture may be responsible for the morbidity, mortality in patients with penetrating injuries is

usually due to causes outside of the diaphragm. Penetrating traumatic diaphragmatic rupture can be overlooked at a rate of 12-66% (3,4).

In our study, we share our 6-year experience with traumatic penetrating diaphragmatic rupture with the data of a retrospective analysis and we aimed to highlight the importance of routine exploration at operations in emergency



conditions and note that in case of diaphragm injuries we may be faced with other injuries of the thoracic and abdominal cavities.

MATERIALS AND METHODS

In our study, between December 2008 and February 2015 from the data of 24 patients, 3 women and 21 men who admitted to our emergency department with the diagnoses of diaphragmatic rupture and underwent operation were analyzed. The age, gender, etiologic diagnosis, localization and size of the injury, accompanied with other organ injuries, surgical procedures, duration of hospital stay, mortality and morbidity rates and reasons were evaluated. Posteroanterior chest X-ray and/or thoracoabdominal computed tomography were performed to stable patients with normal vital signs. In all patients the diaphragm was primarily repaired with nonabsorbable suture (1no prolene).

RESULTS

24 patients with traumatic diaphragmatic rupture were analyzed retrospectively. Eighteen penetrating trauma due to the stab wounds (industrial injuries due to iron stuck in 1 patient and the stabbing in 17 patients), 2 diaphragm rupture due to gunshot injury and 4 iatrogenic penetrating diaphragm injury occurred (2 patients during splenectomy, 1 patient during liver hydatid cyst operation, and 1 patient during the splenic tumor) (Table

Trauma Etiology	n (24)
Stab	
stab wounds	17
Work accidents iron stuck	1
Gunshot wounds	2
Iatrogenic	
Splenectomy	2
Liver hydatid cyst	1
Splenic tumor	1

1). Other patients out of four cases were operated under emergency conditions.

The mean age of 24 patients; twenty-one male and three female was 36.6 ± 7.2 (19-66) years. Localization of the traumatic diaphragmatic rupture was on the left in 20 patients, right in 3 patients and bilateral in 1 patient.

The mean size of the resulting injuries was 2.0 ± 0.8 (0.5-10) cm. Three patients were operated with laparoscopic surgery and the remainder twenty-one with open procedure. Concomitant injuries to other organs were; spleen in 8 patients, liver in 3 patients, lung in 2 patients, stomach in 5 patients, transverse colon in 3 patients, sigmoid colon in 2 patients, small intestine in 5 patients, pancreas in 2 patients and aorta in 1 patient.

The average length of hospital stay was of 10.2 ± 3.8 (1-36) days. 1 patient intraoperatively and 1 patient because of accompanying injury and hemorrhagic

	n (24)
Gender	
Male/Female	21/3
Age (years)	$36,6 \pm 7,2$ (19-66)
Injury location	
Right	3
Left	20
Bilateral	1
The size of the injury (cm)	2.0 ± 0.8 (0,5-10)
Surgery	
Open	21
Laparoscopic	3
Accompanied with other organ injuries	
Spleen	8
Liver	3
Lung	2
Stomach	5
Transverse colon	3
Sigmoid colon	2
Small intestine	5
Pancreas	2
Aorta	1
Hospital Length of Stay (days)	10.2 ± 3.8 (1-36)
Mortality	2



shock had died in the ICU postoperatively. Total mortality was 2. (Table 2).

While the diaphragm repair done with repairs of other organ injuries in all patients, isolated diaphragm repair was performed only to five patients.

With the diaphragmatic repair, 24 patients underwent tube thoracostomy, 1 underwent thoracotomy, 8 patients underwent splenectomy, 2 patients underwent pulmonary resection and primary suture repair, 3 patients underwent small bowel resection, 2 patients underwent intestinal repair, 4 patients underwent primary repair because of gastric laceration, 1 patient underwent subtotal gastrectomy, hemostasis suture repair was performed on liver laceration occurred in 3 patients (1 multiple, 2 single laceration), 3 patients underwent primary repair due to the transverse colon injury, 2 patients underwent left hemicolectomy due to sigmoid colon injury (1 Hartmann procedure, 1 resection anastomosis), 4 patients underwent primary repair because of small bowel injury, 1 patient underwent small bowel resection anastomosis because of injury, 2 patients underwent distal pancreatectomy due to pancreatic injury and 1 patient underwent primary suture due to injury to the aorta.

DISCUSSION

For the first time in 1541 diaphragm rupture was defined by Senertus with the autopsy of a patient presence of lethal stabbing (5). However, the traumatic diaphragmatic rupture in the literature for the first time was reported in 1951 (6). Penetrating traumatic diaphragmatic ruptures are usually occurred as a result of stab wounds and gunshot wounds. (7). In the literature, diaphragmatic rupture resulting due to trauma have been reported and seen oftenly in young male patients and at the fourth decades of life

(8-11). Our study it was found an average age of 36.6 ± 7.2 years old. The male/female ratio has been reported compatible with the literature as 5.7/1. (12) In our study, this ratio was 7/1.

In some studies, the incidence of right sided traumatic diaphragmatic penetrating injuries was found as 61% (13), whereas in our study, the incidence of the right diaphragm rupture in penetrating trauma was only 17% (4/24).

The diameter of rupture was reported about three times as much as in blunt trauma, compared to penetrating trauma (14). However, some other studies of blunt trauma caused by penetrating trauma were seen in larger defects (10). In our study, the diameter of defect in penetrating trauma was found as 2.0 cm (0.5-10).

Because of rupture the intrathoracic herniation of abdominal organs is seen frequently. In penetrating herniation and associated symptoms related to this injury are rare. Therefore, following trauma, chest radiograph should be carefully examined for irregularities detected in the cases of rupture of the lung base and the diaphragm (15).

In general, they can be diagnosed by radiographies at a rate of approximately 20-67% (9,15,16). In stable patients the correct diagnosis can be made with further investigations such as computerized tomography (CT) with a wide range of ratio approximately from 33 to 87% in some series (14,16). An isolated rupture of the diaphragm diagnosis can be done in stable patients after months or even years due to the lack of specific symptoms and signs. In these conditions CT is the most useful tests for the diagnosis of these patients. However, it often can not be used due to the hemodynamically unstable patients.



In some series utilization rate of CT was reported as 25% while the rate of using chest X-ray was determined to be 40% (12).

In penetrating traumas additional diaphragm rupture can be seen as an 80-95% in additional organ injuries (8). Penetrating injury was mostly seen in lung (17). Although the number of penetrating trauma patients was seen in few patients, the accompanying injury to the ruptured diaphragm consist spleen, stomach and small intestine. In our study, isolated diaphragmatic rupture accompanied by 5 other injuries other than the incidence rates of other organ injuries were found high in the patients (19/24 patients). In this case the situation is very likely to create a diaphragm rupture can offers observing any other injured organs. This shows us that in patients with identified diaphragmatic rupture, exploration for other organs should be carried out more carefully. (12)

Patients who were operated for penetrating traumatic diaphragmatic rupture has an average hospital stay ranging from 1 to 36 days, this was found as 10:25 in our study. Mortality was observed on 1 patient at intra-operative period with concomitant other organ injury and hemorrhagic shock and two patients at postoperative period with gunshot wounds.

Limitations of our study can be considered to be a retrospective study and done among with a small number of patients. Randomized, long lasting studies with the numerous patients are needed.

CONCLUSION

Emergency conditions of the thorax and abdominal injuries of penetrating traumatic diaphragmatic rupture in cases of undiagnosed clinically and radiologically; the diaphragm injuries should be kept in mind and routine

exploration should not be neglected by the surgeon.

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