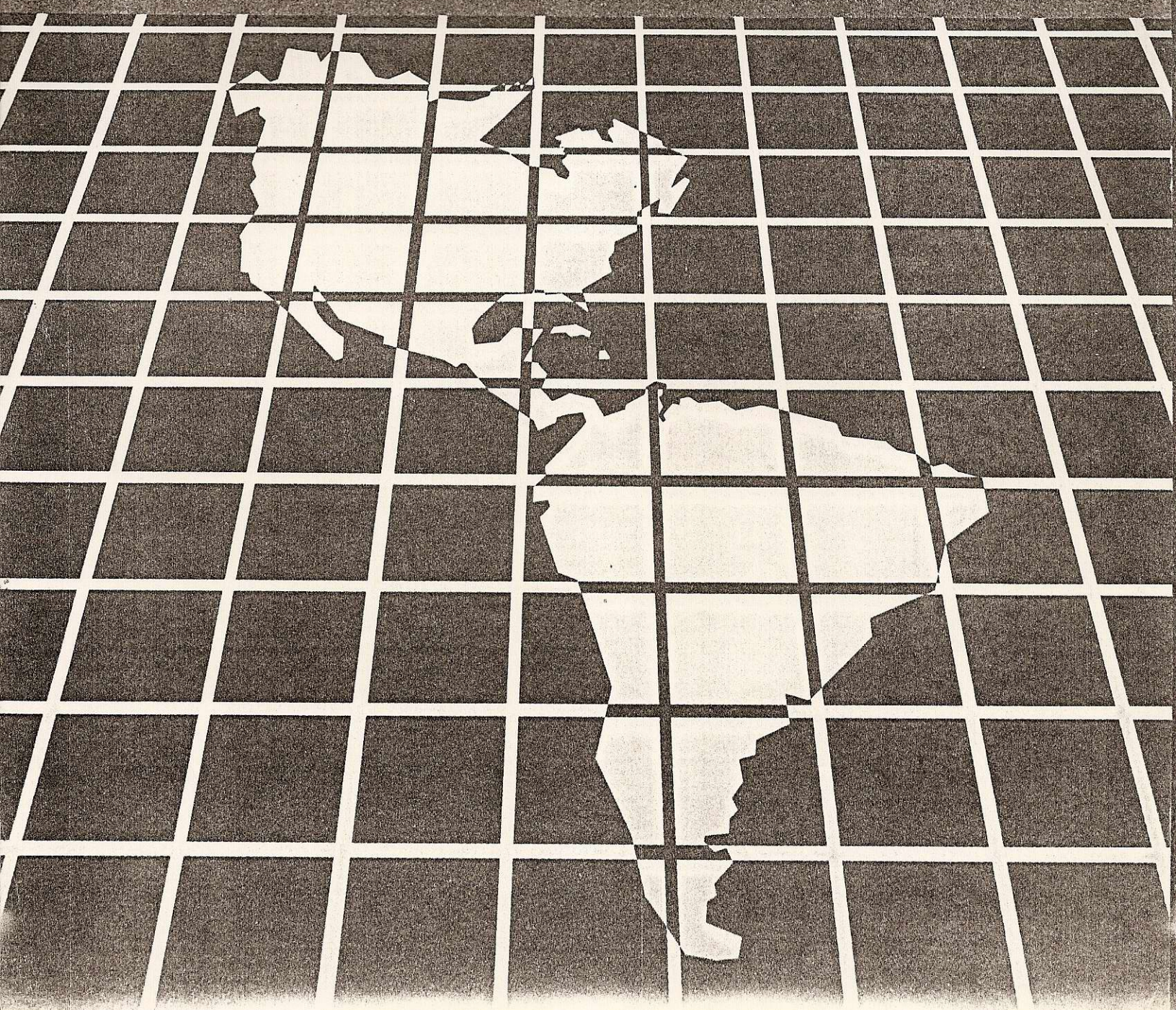
PANAMERICAN JOURNAL OF TRAUMA

ISSN 0121 - 5396

SOCIEDAD PANAMERICANA DE TRAUMA
SOCIEDADE PANAMERICANA DE TRAUMA
PANAMERICAN TRAUMA SOCIETY

Vol. 5 Nº 1 VI 1995



PANAMERICAN JOURNAL OF TRAUMA

CONTENTS / CONTENIDO

Esta publicación fue posible en gran parte gracias al apoyo económico de la Asociación Profesional Médica ASPECMED, A.C., institución conformada por docentes de la Facultad de Salud de la Universidad

DIAPHRAGMATIC INJURIES. LAPAROSCOPIC DIAGNOSIS AND MANAGEMENT. REPORT ON TWO CASES

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SUMMARY

We report two cases of traumatic diaphragmatic injuries, one following a blunt abdominal trauma and other after a thoraco-abdominal stab wound. The first patient presented a bilateral diaphragmatic injury and underwent celiotomy for the correction of the injury. The latter patient underwent laparoscopy for the diagnosis and the lesion was sutured laparoscopically. A brief review of the literature of this condition and a discussion about the use of laparoscopy in the diagnosis and management of diaphragmatic injuries is presented.

INTRODUCTION

Diaphragmatic injury occurs in approximately 4.5% of trauma victims and is mainly caused by non-penetrating injuries. About 25% of these occur on the right side and only 1% occur bilaterally[1]. Traumatic right diaphragmatic injury is infrequent since injury to the right side is more severe than injury to the left side and in general the patient does not reach the hospital alive. Bilateral diaphragmatic lesion is even more rare.

We report two cases of traumatic diaphragmatic injuries, one following blunt a abdominal trauma, and other after a thoraco-abdominal stab wound. The first patient presented a bilateral diaphragmatic injury and underwent celiotomy for the correction of the injury. The latter patient underwent laparoscopy for the diagnosis and the lesion was sutured laparoscopically. Laparoscopy provided a minimally invasive means of diagnosing right sided and bilateral diaphragmatic injuries and provided the treatment in one case.

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CASE REPORTS

Case 1. A 33 year-old Caucasian male, victim of an automobile accident was sent from another service where he presented chest trauma with fracture of costal arches. A hypothesis of right hemopneumothorax was made and 100 ml was drained from the right hemithorax. The patient was then referred to our service, one day after the accident. In our emergency department, he was hemodynamically stable (150/100 mm Hg), tachypneic (28/min) and in a state of reduced consciousness (Glagow = 8; RTS = 5,9672; ISS = 27 and TRISSCAN = 0.93). Abdominal examination showed absence of bowel sounds without tenderness. Pulmonary auscultation revealed a decreased vesicular murmur in the basal third of the right hemithorax. A chest X-ray revealed elevation of the right diaphragmatic dome. The patient was removed to the intensive care unit where respiratory support was instituted. Several complementary tests were performed, such as computerized chest tomography, scintigraphy and magnetic resonance with inconclu-

sive results. Without a definite diagnosis, laparoscopy was indicated and revealed posterior laceration of the right diaphragm that extended to the left hemidiaphragm. The conclusion was bilateral traumatic diaphragmatic injury. Laparoscopic examination allowed the definite diagnosis of this patient, who was then submitted to celiotomy. Surgical findings confirmed bilateral diaphragmatic injury with partial herniation of the liver. The diaphragmatic lesions were sutured with separate non-absorbable stiches. After repair the patient recovered and was discharged.

Case 2. A 28 year-old Caucasian male was admitted to the Emergency Department, victim of a stab wound located at the junction of the sixth right intercostal space with the right mid-clavicular line. There was no loss of consciousness, he was alert and oriented. Vital signs showed a blood pressure of 110/70 mm Hg, pulse rate 100 bpm, regular, respiratory rate of 16/min and Glasgow coma score of 15 (RTS = 7.84; ISS = 13 and TRISSCAN = 0.99). Examination of the abdomen and thorax was unremarkable. Simple abdominal and chest radiographs were normal at admission. Twenty-four hours later, chest X-rays showed blunting of the right costophrenic angle. Therefore, the patient underwent laparoscopic examination that revealed a 4 cm tear of the right hemidiaphragm. The decision was made for laparoscopic suture of the lesion, using two simple stitches with non-absorbable material. After this procedure, tubular drainage of the right thorax was performed. The recovery was uneventful and on the third day, the drain was removed. The patient was discharged on the fourth post-operative day in good condition.

DISCUSSION

Right-sided traumatic diaphragmatic rupture is relatively rare and has been recorded infrequently in medical literature. Greatly improved pre-hospital care and transportation of victims have increased the frequency with which patients sustaining this injury are arriving at the emergency room alive. Bilateral injury is even more severe and so rare that it has been seldom reported in the literature[1].

In most circumstances, radiography of the chest allows a diagnosis of diaphragmatic herniation to be made, especially on the left side. On the right side, differentiation from an intrapleural effusion or intrapulmonary lesion is particularly difficult because the viscus that generally herniates is the liver, which produces a smooth contour not unlike the diaphragm itself[2].

Hepatic scintigraphy, when available, is a highly sensitive method for the diagnosis of right diaphragmatic rupture since it may reveal the presence of the liver inside the thorax, an indirect sign of diaphragmatic lesion[3]. Ultrasound is of low precision for the evaluation of diaphragmatic integrity[4]. Computerized tomography and magnetic resonance are good diagnostic methods, however these techniques are not always available[5,6].

Ikejiri et al.[7] stated that laparoscopy and thoracoscopy are the two major methods for investigation, both of them easily available to trauma surgeons. Thoracoscopy has proved to be effective during the first 24 hours of trauma, since after this time there is formation of pleural adhesions which makes examination difficult and may cause damage to the pulmonary parenchyma[8].

Some authors consider laparoscopy to be somewhat less effective than thoracoscopy because it does not permit a good visualization of the right diaphragm, but it is of great diagnostic importance 24 hours after the trauma[9]. In the first case reported herein, we did not have much difficulty in visualizing the right diaphragmatic lesion, but we were surprised to find a rupture on the left.

In the emergency room, laparoscopy is an quick and safe procedure that allows a prompt diagnosis and can prevent unnecessary surgery, especially in penetrating injuries and in blunt abdominal traumas[10]. In patients with traumatic diaphragmatic injuries with no diagnostic confirmation, laparoscopy may be the major diagnostic method since it permits direct visualization of the peritoneal surface of the diaphragm. In some special cases, like the second case in this paper,

laparoscopy may allow the suture of the diaphragmatic lesion if there is no other intra-abdominal lesion that requires laparotomy.

RESUMEN

Se informa 2 casos de lesión traumática de diafragma: uno después de un trauma cerrado y otro después de una herida toracoabdominal por arma cortopunzante. El primer paciente tenía herida diafragmática bilateral y fue sometido a laparotomía para corrección. El segundo paciente fue sometido a una laparoscopia diagnóstica y la lesión se suturó bajo visión laparoscópica. Se presenta una breve revisión de la literatura y una discusión acerca del uso de la laparoscopia en el diagnóstico y manejo de este problema.

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