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Review article

Approach and Management of Traumatic Retroperitoneal Injuries☆

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ABSTRACT

Traumatic retroperitoneal injuries constitute a challenge for trauma surgeons. They usually occur in the context of a trauma patient with multiple associated injuries, in whom invasive procedures have an important role in the diagnosis of these injuries. The retroperitoneum is the anatomical region with the highest mortality rates, therefore early diagnosis and treatment of these lesions acquire special relevance. The aim of this study is to present current published scientific evidence regarding incidence, mechanism of injury, diagnostic methods and treatment through a review of the international literature from the last 70 years. In conclusion, this systematic review showed an increasing trend toward non-surgical management of retroperitoneal injuries.

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Abordaje y manejo de las lesiones retroperitoneales traumáticas

Palabras clave:
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RESUMEN

Las lesiones traumáticas retroperitoneales constituyen un desafío para el cirujano de traumatología. Ocurren generalmente en el contexto de un paciente politraumatizado, con múltiples lesiones asociadas y en el que los procedimientos invasivos tienen un rol preponderante en el diagnóstico de estas lesiones. El retroperitoneo es la región anatómica que presenta mayores tasas de mortalidad, por lo que el diagnóstico precoz y tratamiento de estas lesiones adquiere especial relevancia. El objetivo de este trabajo es presentar la

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Manejo
Tratamiento

evidencia científica publicada hasta el momento en cuanto a su prevalencia, mecanismo lesional, métodos diagnósticos y tratamiento mediante una revisión de la literatura internacional de los últimos 70 años. Como conclusión, en esta revisión sistemática se pone de manifiesto una creciente tendencia al manejo no quirúrgico de las lesiones que afectan el retroperitoneo.

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Introduction

Abdominal trauma, both blunt and penetrating, occurs with a frequency of approximately 10% in torso trauma cases.[1] The mechanism of injury varies depending on the country, socioeconomic status and culture. This trauma type is one of the main causes of morbidity and mortality in any age group. Trauma in the retroperitoneal compartment has the highest mortality rates.[1] Considering its complex anatomy, the management of retroperitoneal injuries can vary widely (Fig. 1).[2] The objective of this study is to carry out a review of the literature about retroperitoneal injuries, with an emphasis on their prevalence, diagnosis and management.

Methods

A systematic review of the literature was performed using the SCOPUS database under the criteria established by the reviewers, performing specific searches by organs using the following keywords: *abdominal aorta*, *inferior vena cava*, *duodenum*, *pancreas*, *renal vessels*, *kidney*, *adrenal glands*, *ureters*, and *iliac vessels*, associated with *trauma*. All publications in English and Spanish were included. Subsequently, a manual review was conducted from 1960 to date, excluding publications that did not refer to humans, clinical case reports or reviews of the literature, non-trauma mechanisms of injury and pediatric patients (Fig. 2).

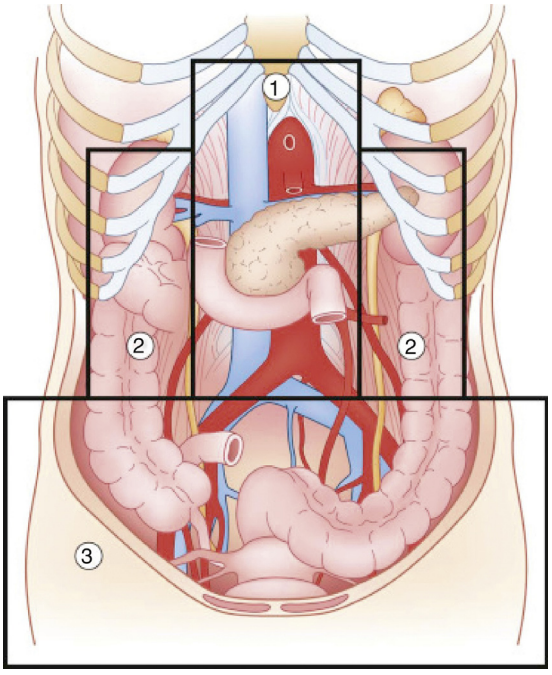

Fig. 1 – Diagram of the retroperitoneal zones (source: Martin et al.[2]).

Prevalence

The incidence of retroperitoneal involvement in the literature is variable. In a study[1] conducted on more than 6000 patients admitted to a specialized unit, 15% had abdominal involvement, 15% of which involved the retroperitoneum. Similarly, an incidence of 12%[3] was reported in blunt abdominal trauma in hemodynamically stable patients by computerized axial tomography (CT). The kidney has been described as the most frequently affected retroperitoneal organ (18%), followed by the pancreas (3.7%) and the aorta (1%), with a predominance of blunt trauma over penetrating.[1]

While demonstrating a variable incidence, the abdominal organs most frequently affected by penetrating trauma are the liver and colon, followed by vascular injuries and the pancreas.[4]

Zone 1

Zone 1, or the central zone, is delimited by the diaphragm above and reaches the aortic bifurcation below. It includes the aorta, the origin of the large vessels, the duodenum and the pancreas. Blunt trauma to this region affects the duodenum and the pancreas to a greater extent, with vascular lesions being less frequent. Most of the series analyzed report a duodenal injury rate that does not exceed 12%.[4–9] Pancreatic injuries have an incidence that ranges between 1% and 12% of penetrating trauma, and 5% of blunt trauma.[10] Mortality ranges from 10% to 46%, with ductal damage being an important predictor of morbidity and mortality.[10] Regarding the mortality due to duodenal injury, some series report ranges from 15% to 47%, which increases to 67% with seven or more associated organs injured.[4] The most frequent complication is duodenal fistula or dehiscence.

Among the vascular lesions, inferior vena cava injury stands apart, representing 30%–40% of abdominal vascular injuries. Their overall mortality rate varies from 34% to 70%, and factors for morbidity and mortality include both the level of the injury and the existence of active bleeding or other associated lesions.[11] Mortality due to suprahepatic and retrohepatic lesions varies between 78% and 100%, while adrenal injury mortality ranges from 33% to 66% versus 25% mortality in infrarenal vein cava involvement.[11,12] Prehospital mortality rates are reported to range from 30% to 50%, and these figures are maintained after hospital admission.[12] Abdominal aorta injuries are around 0.2%,[13] and its high immediate mortality rate is the second most common cause of

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