Pelvic trauma: review of arterial lesions and endovascular treatment

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Learning objectives

The purposes of the exhibit is:

- To review the major types of injuries and compromised arteries in pelvic trauma.
- Describe the angiographic findings in patients with pelvic trauma underwent arterial embolization to control bleeding.

Background

- Hip fractures are associated with clinical vascular injuries in approximately 15% of cases and relate to mortality between 30 and 50% [1]. The main cause of early death corresponds to hemorrhagic shock [2,3].
- The vessels of the pelvis are closely related to osteoarticular structures and there is a correlation between severity of bone fractures and vascular lesions observed [1].
- Two groups of lesions are individualized: truncal and distal/collateral vessels. Associated vascular lesions are commonly observed. Retroperitoneal hematoma corresponds to the most common clinical translation of bleeding [1].
- The anatomic type of pelvic fracture is a determinant factor in the prognosis of patients [4].
- Radiography allows to analyse the complexity of trauma. Ultrasound can show hemoperitoneum. Computed tomography (CT) allows the visceral analysis. Angiography confirms the diagnosis of active bleeding in approximately 80-90% of cases and became an indispensable tool in the treatment of pelvic trauma [5].
- The diagnosis of these lesions can be done by CT angiography, but treatment must be done, preferably by endovascular approach.
- Seven to 11% of patients with hip fracture require arterial embolization (AE) and the goal of treatment is the hemostasis [6]. Indications of AE in pelvic trauma should be employed in the presence of signs of arterial lesion on angiogram [7].
- In this study a review was made of 53 patients who had severe pelvic trauma, who had bleeding and who underwent angiography and 93 were identified pelvic arterial lesions, which had endovascular treatment.

Imaging findings OR Procedure details
• During four years, 93 pelvic arterial lesions were identified in 53 patients. The angiographic changes correlated to the type of fracture (by Resnick) [5], the number of injured arteries (single or combined lesions), and injured arteries- trunk or collateral. The angiographic findings were divided into contrast extravasation, dissection (with or without pseudoaneurysm) and arterial amputation.

• In 71.6% of patients, there was a predominance of type III of pelvic ring fractures and in 44.7% of this was associated with acetabular fractures. Arterial lesions were combined in 54.7% of cases. There were 26 truncal lesions (internal iliac artery and its anterior and posterior trunk), wich internal iliac artery was affected in 65% (n=17). Of the 67 collateral lesions of the intern iliac artery, the superior gluteal artery was affected in 28.3% (n=19), followed by lateral sacral artery (n=10) and obturatory and pudendal arteries (n=9).

• Extravasation of contrast (EC) was the main arteriographic finding (72%) in the truncal lesions, associated with dissection (11.1%) and amputation (16.6%) arteries.

• In collateral arteries injured, the extravasation of contrast was the main isolated finding (84.8%).

Images for this section:

![Fig. 1: (A) selective angiogram of right superior gluteal artery showing contrast extravasation in a type III fracture and (B) successful endovascular treatment without CE in a control angiogram.](image-url)
Fig. 2: (A) Right iliac wing and acetabulum fractures CT and (B) selective angiogram of right internal iliac artery with superior gluteal artery pseudoaneurysm associated with proximal narrowing and distal branches dilatation and slow blood flow.

Fig. 3: Right sacroiliac joint fracture CT and pelvic angiogram with amputation of anterior trunk of the right internal iliac.
Conclusion

Corroborating the literature, in our study there was correlation between the severity of bone fractures and vascular lesions, and the contrast extravasation corresponded to the main angiographic finding of the predictive endovascular treatment and hemostasis.

Personal Information

References


