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Surgical Management of an Intercostal Artery False Aneurysm Due to a Stab Wound

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Abstract

Pseudo-aneurysm are due to arterial wall disruption leading to the formation of a perfused sac that communicates with the arterial lumen. This entity remains at highly significant risk of rupture. The majority of cases are presenting as haemothorax.

Intercostal artery pseudo-aneurysms are extremely rare, most of them were associated with surgical interventions or blunt thoracic trauma, only one case was reported after a knife stabbing wound.

We describe the case of a young male patient who was stabbed with a knife in his posterior left chest side and was first operated to evacuate a contained hematoma only to re-consult after 20 days for a pulsatile mass which proved to be an intercostal artery pseudo-aneurysm. The patient was successfully surgically managed and was discharged 4 days after the surgery.

Keywords

Thoracic Trauma; Surgery; Neck; Hematoma

Introduction

Arterial pseudo-aneurysms are common and caused by an arterial wall damage that is responsible for a locally contained hematoma in a defined space beyond the confines of the vessels and a patent blood flow from a persistent neck. The most common cause is iatrogenic after arterial access for endovascular procedures [1].

Less frequently the cause may be post traumatic and in more extremely unusual conditions, the pseudo-aneurysm may depend on an intercostal artery [2]. We report the case of a successful surgical management of a posterior intercostal artery pseudo-aneurysm.

Case Description

An 18-year-old male patient was stabbed with a knife in his posterior left chest side, he was emergently transferred to the proximate emergency center. Physical examination showed the presence of a bleeding 3 cm wound with a 5 cm hematoma underneath regarding the left paravertebral muscle (Fig. 1). The patient was hemodynamically stable, blood pressure values were normal (145/87 mm/Hg), heart rate was at 94 beats per minute and the patient had no signs of dyspnea. He was then explored with a thoracic CT scan showing the hematoma but without highlighting the presence of a pseudo-aneurysm.

Figure 1: Posterior thoracic palpable mass of the false aneurysm.

The hematoma was surgically evacuated, the wound was sutured and the patient was discharged after 2 days. The patient consulted 10 days after in our institution for intense recurring pain and clinically remarkable increase in the hematoma diameter. There patient was perfectly stable.

Physical examination showed a palpable 5 cm pulsating mass located in the posterior left chest regarding L1.

We decided to repeat the thoracic enhanced contrast CT scan in order to closely explore the increasing mass, we found a 77×79 mm hematoma inside the paravertebral muscle and a patent pseudo-aneurysm originating from an intercostal artery measuring 25×41 mm (Fig. 2).

Figure 2: CT scan showing the posterior false aneurysm.

We decided to operate the patient via a posterolateral thoracotomy. The pseudo-aneurysm was excised and the intercostal artery was ligated (Fig. 3).

Figure 3: Operative view showing the opened false aneurysmal sac.

The surgical outcomes were simple and the patient was discharged 4 days after the surgery.

Discussion

In our knowledge, we are describing the second case of intercostal artery pseudo-aneurysm secondary to a stab wound in the literature [3]. These pseudo-aneurysms generally form after surgical procedures that involve the intercostal space or Thoracentesis [3,4].

Hemothorax is the most frequent presentation, extra pleural hematomas were also reported in addition to palpable thoracic masses [3,5].

Radiological exams are necessary to confirm the diagnosis and to help choosing the best therapeutic approach. CT scan has been demonstrated to be reliable, high-quality imaging tool to assess vascular abnormalities and provide fast results due to short scanning time. CT disadvantages are associated with patient exposure to radiation and contrast agents [4].

Pseudo-aneurysms can spontaneously thrombose, in a case reported by Bluebond-Langner, et al., an intercostal artery pseudo-aneurysm acquired after retroperitoneal laparoscopic nephrectomy was spontaneously thrombosed after 1 month [6].

Nevertheless, the risk for spontaneous pseudo-aneurysm rupture and mortality is high regardless of size. For these reasons, some authors support treatment for all pseudo-aneurysms, despite the size and symptomatology. In fact, death cases that were reported in literature and resulted from an intercostal artery pseudo-aneurysm rupture outline the potential danger of untreated intercostal pseudo-aneurysm and underscores the importance of definitive treatment [5,7].

Treatment could be surgical or endovascular. Embolization is the first approach to consider in the management of a ruptured intercostal pseudo-aneurysm. When embolizing small arteries with some collaterals like the case of intercostal arteries, the use of particles in addition to proximal micro coils achieves a distal and proximal occlusion, in order to completely exclude the pseudo-aneurysm. However embolization encounters some failures that are probably due to very small collaterals that are too small or invisible at the initial angiography [5].

To reduce failure's risk, understanding of anatomic features is needed and adjacent vessels providing collateral branches must be pre assessed and occluded if needed, with important attention to collaterals originating from the musculophrenic and anterior intercostal arteries [3].

Surgery remains a radical and effective treatment that completely excludes the pseudo-aneurysm. It is essentially indicated for complex or refractory cases [8]. Thoracotomy is usually chosen to access the intercostal artery but complications such as paresthesia or anesthesia frequently take due to nerves section [9].

Conclusion

Intercostal artery pseudo-aneurysm due to a stab wound is an extremely rare event with early risk of rupture, diagnosis and treatment before rupture are essential for patient's recovery and avoiding complications.

The aim of treatment is to completely exclude the pseudo-aneurysm, it could be done using endovascular approach or radical approach using surgery.

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