Case report

Endovascular treatment of a ruptured post-traumatic false aneurysm of the aortic isthmus: A case report

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ABSTRACT

Introduction: The false aneurysm of the aortic isthmus is, given its severity and case fatality rate, a subject of interest in vascular surgery. The interest of this article is the analysis of the different characteristics of this pathology based on the study of a case report and on a review of the literature.

Case report: This is a 21-year-old patient admitted for the management of a severe polytrauma following a fall from a cliff, causing him paraplegia following a fracture of the dorsal spine which is objectified on the CT bodyscan, which also shows the presence of a localized dissection with ruptured false aneurysm of the isthmus. After emergency conditioning and initial neurosurgical management by vertebral osteosynthesis, the post-operative effects are aggravated by the occurrence of a bilateral massive pulmonary embolism. Thus, given the high risk of complications or death following classic thoracotomy surgery, we decided to carry out endovascular treatment by placing a covered endoprosthesis.

Discussion: The aortic isthmus false aneurysm is a relatively rare condition that mainly interests the young subject in an often-post-traumatic context. The surgical treatment represented by thoracotomy, which, in addition to being invasive, exposes the patient to multiple complications as disabling as each other. All of these elements explain the advantage of endovascular treatment, which is much less invasive with a better prognosis.

Conclusion: The therapeutic management of a pseudoaneurysm of the isthmus is undergoing constant development; endoprostheses currently occupy the place of choice in the treatment of these lesions.

1. Introduction

The aortic isthmus false aneurysm is, due to its severity, and case fatality rate a topic of interest in vascular surgery. The interest of this article is the analysis of the epidemiological, clinical, paraclinical, prognostic and therapeutic characteristics of post-traumatic false aneurysms of the aortic isthmus based on the study of a case observed at the level of the Vascular Surgery department of the Mohammed VI University Hospital of Oujda and on a review of the literature.

2. Case report

This is a young patient aged 21, with no notable pathological history, admitted to the emergencies for the management of a severe polytrauma following a fall from a 9-meter cliff, with a thoraco-abdominal and dorsal impact point, in whom the clinical examination found a conscious and stable patient, paraplegic, and in whom the CT bodyscan shows the presence of a localized ruptured dissection of the aortic isthmus with the appearance of a false aneurysm (Figs. 1, 2), 15 mm from the origin of the left subclavian artery, complicated with a right hemo-pneumothorax and pneumopericardium; and with a D8–D9 dislocation fracture (Fig. 3).

After emergency conditioning and initial neurosurgical management of the D8–D9 vertebral spine fracture by laminectomy and osteosynthesis (Fig. 4), the early postoperative effects are marked by worsening chest pain and the onset of dyspnea associated with 85% SpO2, with a minimal progressive deglobulization of 1 point of hemoglobin which motivated the realization of a second thoracic CT angiography, which showed the presence of a bilateral massive pulmonary embolism with stability of the image of false aneurysm associated with a localized ruptured dissection of the isthmus.

Thus, given the high risk of complications or death following classic thoracotomy surgery, the discussion of performing endovascular treatment for the exclusion of the pseudoaneurysm by closing the dissection flap was raised, after consent and information from the patient.

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After a preoperative anesthetic preparation, and the realization of a sizing of the endoprosthesis, the patient benefited, placement of a covered stent graft (Fig. 5) of the descending thoracic aorta (TEVAR), under a local anesthesia associated with a sedation, by approach of the right Scarpa and percutaneous puncture of the common femoral artery.

The patient was initially transferred to the intensive care unit for monitoring and additional medical care. The course is satisfactory, marked by the disappearance of the chest pain. A control CT angioscan was performed, which was satisfactory with no sign of complications.

Late hospitalization is marked by the onset of a second segmental left pulmonary embolism, related to chronic bed rest of the patient who is paraplegic, despite effective oral anticoagulation, however, the final outcome of which is satisfactory.

(SCARE 2020) [8].

3. Discussion

The aortic isthmus false aneurysm is a relatively rare condition [1] which mainly concerns young males aged less than 50 years and which most often results from the phenomena of deceleration and shearing encountered during a traffic collision [2].

It is a zone of fragility located between the aortic arch which is

Figs. 1, 2. Axial and sagittal slice of CT angiography showing the ruptured pseudoaneurysm of the aortic isthmus (arrow on the image).

Fig. 3. Sagittal section of the CT angioscan showing the fracture-dislocation of the dorsal spine.

Fig. 4. Postoperative chest x-ray showing vertebral osteosynthesis, with visualization of the endoprosthesis well positioned.
movable and the descending aorta which is attached to the spine. Les-
sions in the ascending aorta are rarer but more serious [3].

This is a very serious condition. Most patients with aortic rupture die
at the accident site. Those who survive to hospital have a high risk of
complete rupture and death: 50% within 8 h and 80% within 24 h [4].

In 10% of patients, the pseudoaneurysm of the isthmus is asym-
momatic and is discovered incidentally on an X-ray image distant from
the initial trauma [4].

CT angiography is currently the diagnostic test of choice, overtaking
arteriography [5].

The surgical treatment represented by the thoracotomy, once indi-
cated in the overwhelming majority of cases, is convincing fewer and
fewer surgeons. This technique, in addition to being invasive and
requiring the use of selective ventilation and aortic clamping, exposes
the patient to multiple complications, each equally disabling [5,6]. All of
these factors explain the growing enthusiasm for [7].

4. Conclusion

The therapeutic management of the false aneurysm of the aortic
isthmus is constantly evolving, stents, which currently occupy the place
of choice concerning the treatment of these lesions may be dethroned in
the future by multilayer stents, which have the particularity of recon-
structing the aortic wall instead of excluding it.

Consent

Written informed consent was obtained from the patient for publi-
cation of this case report and accompanying images. A copy of the
written consent is available for review by the Editor-in-Chief of this
journal on request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Availability of data and material

The datasets in this article are available in the repository of the ENT
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Ethical approval

The study committee of the university hospital center approves the
favorable opinion to publish this work.

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CRediT authorship contribution statement

Dr. OA, have analysed and performed the literature research, Pr. AR,
Pr. AB, Pr. OE, performed the examination and performed the scientific
validation of the manuscript. Dr. Oussama Anane was the major
contributor to the writing of the manuscript. All authors read and
approved the manuscript.

Declaration of competing interest

All authors disclose any conflicts of interest.

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Fig. 5. (A) Intraoperative aortography during catheterization of the aortic arch with opacification of the supra-aortic trunks.
(B) Control aortography after release of the single module of TEVAR showing the absence of endoleak and the exclusion of the false aneurysm without coverage of the left subclavian artery. The vertebral osteosynthesis material also appears on the image.
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