

Case Report

False Aneurysm of The Ascending Aorta Following Open Heart Surgery in an 8- Year-Old Boy: A Case Report

M. Abdelbaki, M. Touati

Cardiology Department, EPH Mixte de Laghouat. ALGERIA.

Received: 05 September, 2023

Accepted: 08 October, 2023

Published: 14 October 2023

Abstract:

This case report describes an 8-year-old boy with a prior history of open heart surgery for sub-aortic stenosis who presented with shortness of breath and chest pain four months post-operation. Echocardiography and AngioTDM revealed a large false aneurysm of the ascending aorta. Closure of the communication orifice was successfully achieved using ADO II 6/6, with subsequent coagulation of the blood within the false aneurysm and thrombus formation.

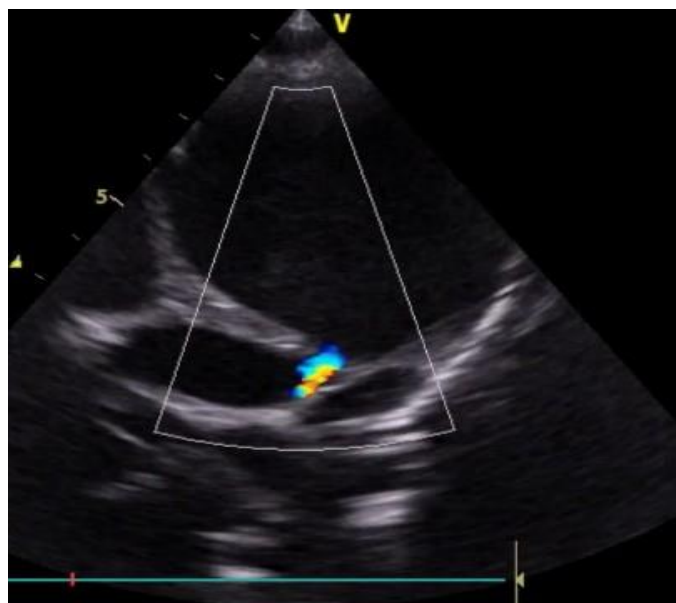
Keywords: False Aneurysm, Ascending Aorta, Open Heart Surgery, Sub-aortic Stenosis, ADO II, AngioTDM.

Introduction:

False aneurysms of the ascending aorta post-cardiac surgery are rare and can present with life-threatening complications. Few cases have been reported in the literature, highlighting the rarity and significance of this case.

Echocardiography:

- Presence of a large false aneurysm adjacent to the aortic wall, with clear communication to the aorta.
- Blood flow detected from the aorta into the aneurysm, confirming its false nature.



Case Presentation:

An 8-year-old male with a history of open heart surgery for sub-aortic stenosis presented with a 4-month history of shortness of breath and chest pain. Physical examination was consistent with heart failure.

Diagnostic Assessment:

Echocardiography revealed:

- Ascending Aorta: Echocardiographic views, especially the parasternal long-axis view, showed the proximal ascending aorta to have a normal caliber and wall motion. However, as we trace distally, adjacent to the surgical site of the prior subaortic stenosis correction, there's a prominent outpouching consistent with the false aneurysm.
- threatening structure: Orifice of Communication: The point of communication between the ascending aorta and the false aneurysm was noted to be approximately 6mm in diameter. Color Doppler imaging showed a turbulent flow at this orifice, confirming its patency and direct communication.

Aneurysmal Sac Contents: Within the aneurysmal sac, swirling patterns of blood flow were visualized, indicative of the flow dynamics within the sac. There was no evidence of intramural hematoma or layered thrombus at the time of evaluation.

The communication orifice between the aorta and the false aneurysm was 6mm. Doppler studies showed turbulent flow within this orifice.

AngioTDM:

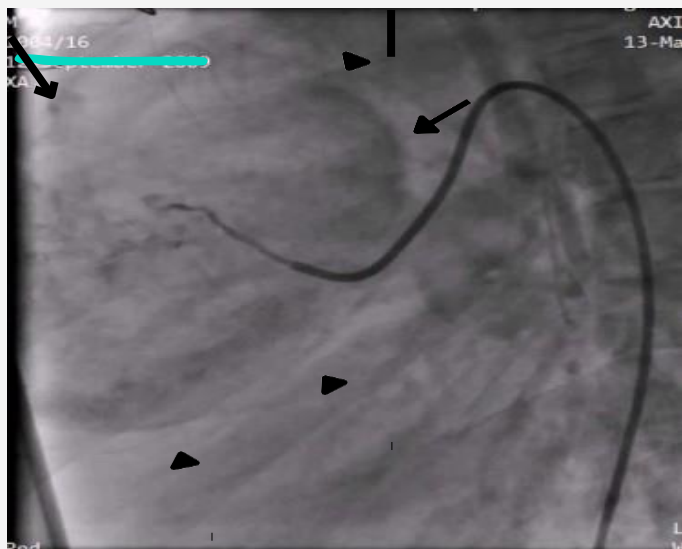
confirmed the presence of the false aneurysm and delineated its exact dimensions and relations with surrounding structures.

The following detailed interpretation of the aortic angiography findings can be provided:

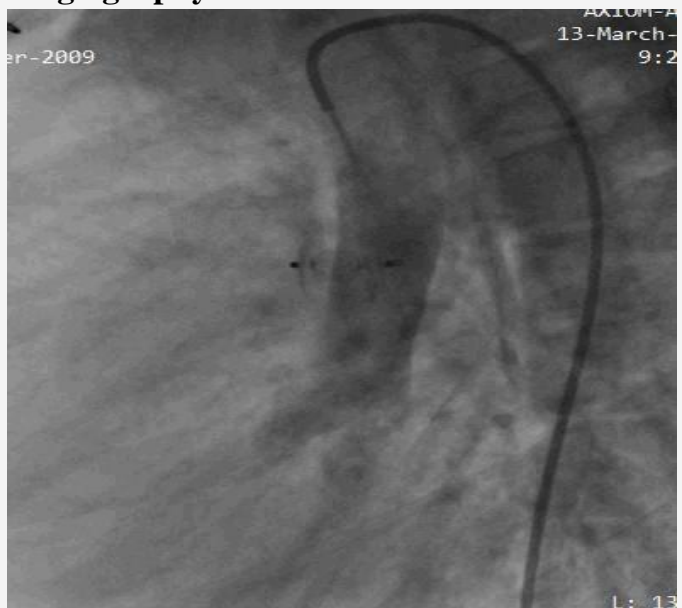
1. **Ascending Aorta:** The ascending aorta appeared to have a normal caliber proximally, but distally, adjacent to the surgical site of the prior subaortic stenosis intervention, there was an evident bulging representing the false aneurysm.

2. **Location and Size:** The angiography clearly depicted an outpouching from the anterolateral wall of the distal ascending aorta, consistent with a false aneurysm. The dimensions of the aneurysm were substantial, with a maximum diameter reaching 80mm.
3. **Orifice of Communication:**

A crucial aspect noted was the orifice that provided communication between the ascending aorta and the false aneurysm. This orifice measured approximately 6mm in diameter and was located proximally at the base of the false aneurysm.



Angiography



Detailed anatomical confirmation of the 80mm false aneurysm.

Precise localization of the 6mm orifice, essential for guiding intervention.

Flow Dynamics:

Contrast flow dynamics showed brisk filling of the aneurysmal sac during the arterial phase, confirming the direct communication with the aorta. There was no evidence of delayed emptying, suggesting that there were no additional small communications or fistulous tracts associated with the aneurysm.

Percutaneous Occlusion:

Device Deployment:

The ADO II 6/6 device is loaded onto the delivery system and threaded over the guidewire, positioning it across the orifice between the aorta and the aneurysm.

The device is then deployed, ensuring that one disk sits within the aorta and the other within the aneurysmal sac. This "sandwiches" the orifice between the two disks, leading to its closure.

Proper positioning is checked using fluoroscopy and contrast injection to ensure there's no residual flow between the aorta and the false aneurysm.

Device Release:

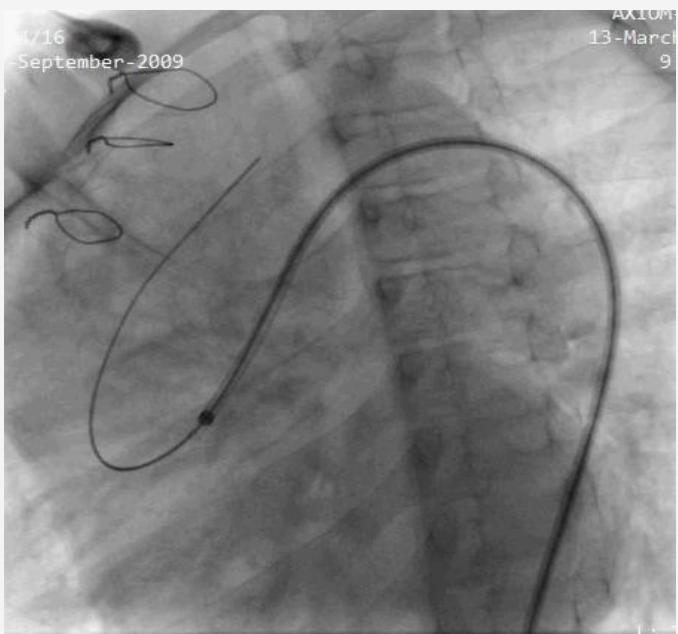
Once satisfied with the device's position and the absence of any complications, the device is released from the delivery system.

Post-deployment Angiography:

Another angiogram is performed to confirm the complete closure of the orifice and ensure there are no complications like device migration.

Removal of Equipment and Hemostasis: The guidewire, catheter, and introducer sheath are removed from the femoral artery.

Hemostasis is achieved either by manual compression.



Crossing the communication orifice

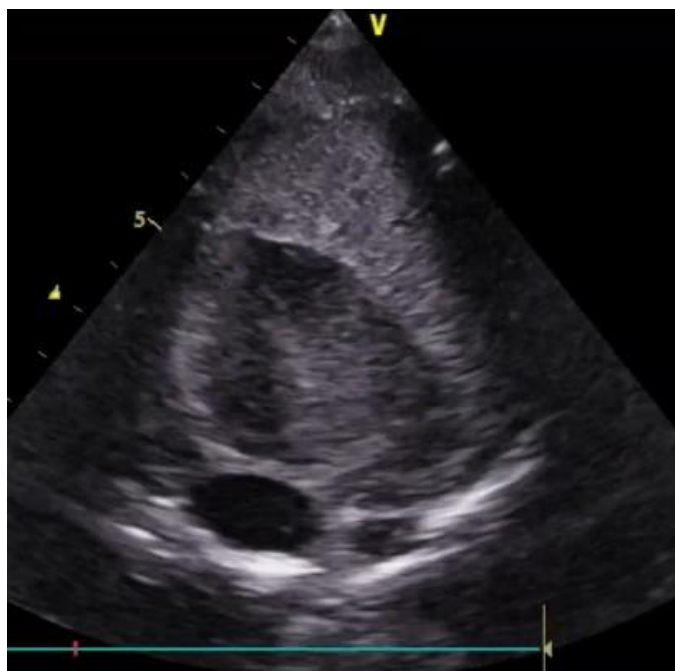
Final angiography showing a good position of the occlude

- The patient is transferred to a recovery room for monitoring.
- Vital signs, vascular access site, and overall patient well-being are monitored closely.
- After a few hours and ensuring no complications, the patient can be shifted to a regular room.

Follow-up:

Echocardiography is performed within 24 hours to confirm the

device's position and assess the false aneurysm's status. Periodic follow-up with imaging, usually echocardiography or CT angiography, is scheduled to monitor the long-term position of the device and the status of the aneurysm.



Discussion:

1. Therapeutic Options:

Observation: In some very small and stable aneurysms, watchful waiting with close monitoring might be considered. This involves regular imaging to monitor the size and nature of the aneurysm.

Surgical Repair:

Direct surgical excision: This involves removing the aneurysm and repairing the aorta. This option can be highly invasive, especially in patients who have undergone previous surgeries, as adhesions can increase operative risk.

Patch repair: A patch is used to close the communication between the aorta and the aneurysmal sac. This might be indicated if the communication orifice is large or if there are concerns about the aneurysm's wall integrity.

Endovascular Repair: This is a less invasive option, where devices, such as stent grafts or coils, are deployed via catheters to exclude the false aneurysm from circulation.

Percutaneous Closure: This involves using devices like the Amplatzer Duct Occluder (ADO II) to close the orifice between the false aneurysm and the aorta.

2. Risk:

- **Observation:** Risk of rupture or dissection if the aneurysm enlarges, thrombus formation leading to embolization, and compression of adjacent structures.
- **Surgical Repair:** Surgical complications like bleeding, infection, injury to adjacent structures, risks associated with cardiopulmonary bypass, and recurrence of the aneurysm.
- **Endovascular Repair:** Risk of device migration, endoleaks

(persistent blood flow into the aneurysm sac), vascular access complications, and radiation exposure.

- **Percutaneous Closure:** Potential for device embolization, incomplete closure leading to residual flow, and vascular access complications.

3. Reason for Choosing Percutaneous Closure:

Given the size of the false aneurysm,

observation was not ideal due to the risk of rupture and other complications. Surgical repair, though definitive, would be highly invasive and carries significant risks, especially in a pediatric patient who has already undergone open-heart surgery. The post-operative recovery, potential complications, and psychological trauma associated with another open procedure also need to be considered.

The endovascular approach, while less invasive than surgery, can be challenging due to the size and anatomy of vessels in pediatric patients, and the availability of appropriately sized devices might be a limitation.

The percutaneous closure using the ADO II 6/6 presents a minimally invasive option that can be performed under imaging guidance. Given the clear visualization of the orifice and its size, there's a high probability of successful closure using this approach. Moreover, the procedure's recovery time is shorter, and the risk of complications is comparatively lower.

Conclusion:

This case highlights the rarity and potential severity of false aneurysms post subaortic stenosis surgery in children. Timely diagnosis and intervention using minimally invasive techniques can lead to favorable outcomes.

Ressources and References:

1. A. Quhba, Pseudoaneurysm of the ascending aorta. Rare complication following aortic valve replacement, *Annales de Cardiologie et d'Angéiologie* Volume 60, Issue 3, June 2011, Pages 179-182
2. L. Bonnie Pseudoaneurysm of the Ascending Aorta After Aortic Valve Replacement, *Journal of the American Society of Echocardiography* Volume 11, Issue 3, March 1998, Pages 303-306 Soumaya Bendjaballah, Faux anévrisme de la crosse aortique fistulisé dans le poumon gauche : à propos d'uncas

Copyright (c) 2023 The copyright to the submitted manuscript is held by the Author, who grants the Clinical Medicine and Health Research Journal a nonexclusive license to use, reproduce, and distribute the work, including for commercial purposes.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)