Secondary brachial ischemia due to purulent brachial aneurysm. A case report

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Background
The case report we present regards a 40-year-old patient who came to the emergency department with a purulent aneurysm of the right brachial artery, of which only 62 cases have been reported. The patient presented ischemic changes, hence a Doppler ultrasound was performed, confirming the presence of an aneurysm with absent distal flow. Subsequently, the aneurysm was resected, revealing purulent tissue. To restore circulation, a bypass was performed. In the postoperative period, the patient had seropurulent discharge for 4 days, which later transitioned to serous discharge without complications. The significance of swift diagnosis, immediate management, and surgical treatment cannot be underestimated in cases like this.

Keywords: brachial aneurysm, brachial ischemia.

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Brachial aneurysms are a rare condition that has posed challenges in terms of study. Aneurysms involve an arterial dilation affecting all three layers of the blood vessel. They often manifest as incidental findings due to their typically asymptomatic nature. They are associated with patients who have vascular invasions (IV drug use or hemodialysis catheters), (1) congenital conditions such as Kawasaki syndrome, Buerger's disease, Ehlers-Danlos syndrome, and Kaposi's sarcoma.(2)

Purulent aneurysms were first described by Osler in 1851 to denote aneurysms resulting from septic embolism secondary to endocarditis.(3) True aneurysms of the brachial artery are uncommon, with the most commonly encountered aneurysms in peripheral vessels being popliteal aneurysms, accounting for up to 85% and occurring in less than 1% of the population.(4) Femoral aneurysms follow in frequency, while brachial aneurysms are exceedingly rare. They are often associated with trauma, arteriovenous fistulas, or infection.(5) Doppler ultrasound is the initial imaging study of choice for diagnosing a brachial aneurysm, with computed tomography also being reasonable, and angiography reserved for select cases.(6) Given the scarcity of documented cases, it is important to present this case report, along with the management undertaken for this patient.

We present the case of a patient with a purulent brachial aneurysm that was incidentally diagnosed. The treatment consisted of resecting the brachial aneurysm and performing a bypass using the saphenous vein.

Case report

A 40-year-old male patient with a medical history of the following conditions: hypertension for 5 years under losartan treatment, Chronic Kidney Disease (KDIGO Stage 5) with 3 years of renal replacement therapy via hemodialysis and an arteriovenous fistula in the left thoracic limb, type 2 diabetes mellitus for 8 years managed with 850 mg metformin twice daily, tracheostomy due to post-COVID-19 complications for 4 months, severe anemia, and pulmonary fibrosis secondary to COVID-19.

The patient reports pain in the right upper extremity for the past 15 days. The pain started suddenly without preceding events. He describes the pain as stabbing, non-radiating, which gradually became incapacitating after a hemodialysis session. He also experienced increased temperature, paresthesias, and discoloration of the hand, with digital ischemia affecting all 5 fingers.

Upon physical examination, the patient is conscious, alert, and displays a painful expression. Vital signs include blood pressure of 135/78 mmHg,

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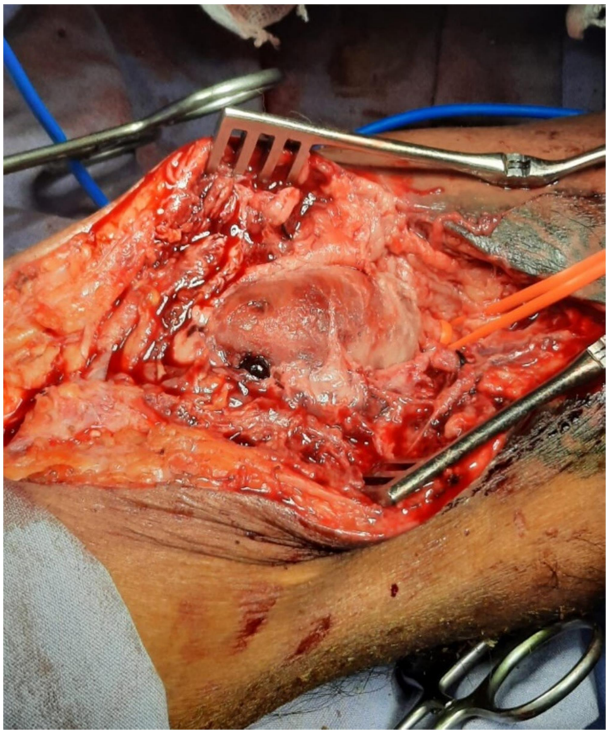

Figure 1. Brachial aneurysm. Surgeons view.

respiratory rate of 17 breaths per minute, heart rate of 88 beats per minute, and body temperature of 36.7°C. Cardiac auscultation reveals regular heart sounds without added sounds or gallops. The right upper extremity shows ischemic color changes and paleness, with decreased temperature compared to the other extremity. The radial and ulnar pulses on the right side are absent, and capillary refill time is greater than 4 seconds. The patient exhibits firm edema on the anteromedial aspect of the forearm and the medial arm, accompanied by redness, increased temperature, and intense pain upon palpation, without fluctuation.

Laboratory results show hemoglobin level of 9.2 g/dL, hematocrit of 27.7%, platelet count of 282,000/mm3, leukocytosis of 22,700/mm3, neutrophils at 91%, procalcitonin level of 1.74 ng/mL, uric acid of 5.8 mg/dL, urea of 135 mg/dL, glucose of 78 mg/dL, BUN of 63 mg/dL, creatinine of 8.3 mg/dL, cholesterol of 92 mg/dL, and triglycerides of 87 mg/dL.

An Eco-Doppler is performed to assess arterial flow, revealing a 6x4 cm aneurysm in the right brachial artery, with absent flow in the radial and ulnar arteries. Firm edema is observed in the medial forearm, along with signs of compromised vascular integrity. Aseptic measures are taken, and a longitudinal incision is made on the medial aspect of the right arm, yielding approximately 100 mL of non-foul-smelling purulent material. Proximal and distal arterial control is established using surgiloops (Figure 1). Ligation and complete resection of the aneurysm are performed, revealing a contained ruptured

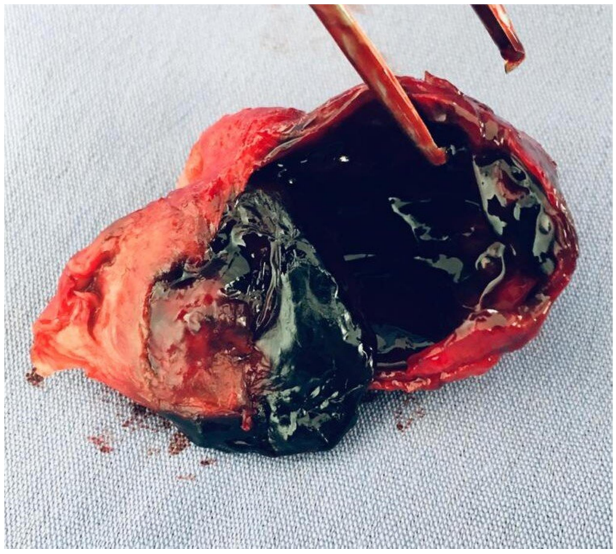

Figure 2. Brachial aneurysm with internal clot.

aneurysm with subacute clot formation within (Figure 2). Purulent material is found in the deep compartment, leading to surgical cleansing with saline solution. A bypass is established, with proximal anastomosis and the insertion of a Fogarty catheter into the brachial artery to remove clots. The same procedure is carried out in the radial and ulnar arteries, extracting thrombi as well. Distal anastomosis is performed, ensuring patency, followed by hemostasis. A subcutaneous drain is placed for wound drainage.

Discussion

A 40-year-old male patient with a medical history of the following conditions: hypertension for 5 years under losartan treatment, Chronic Kidney Disease (KDIGO Stage 5) with 3 years of renal replacement therapy via hemodialysis and an arteriovenous fistula in the left thoracic limb, type 2 diabetes mellitus for 8 years managed with 850 mg metformin twice daily, tracheostomy due to post-COVID-19 complications for 4 months, severe anemia, and pulmonary fibrosis secondary to COVID-19.

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Conclusion

Purulent aneurysms of the brachial artery are a very rare condition, and treatment should be done urgently. It starts with broad-spectrum antibiotics until a culture is obtained, followed by immediate surgical intervention to prevent further complications in the limb, as well as reperfusion syndrome. Autologous graft placement is necessary, and the greater saphenous vein is most commonly used due to its easy accessibility, as was done in this case. Adequate cleaning and drainage are also necessary for monitoring output and preventing collections that may damage the graft, although the risk of amputation is high due to the infection. In this case, the duration of antibiotic therapy was much shorter than reported in the literature, with good results so far.

Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

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