Idiopathic true brachial artery aneurysm in a nine-month infant

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Abstract

Upper extremity peripheral artery aneurysms are a rarely encountered arterial disorder. Brachial artery aneurysms seen in the pediatric age group are generally trauma resultant. A nine-month-old male infant patient presented with complaints of an asymptomatic mass in the arm. Following Doppler ultrasonography and magnetic resonance imaging (MRI) examinations, saccular aneurysm, originating from the left brachial artery was diagnosed in the patient without history of trauma. The aneurysm was resected by surgical intervention, and primary repair of the brachial artery was performed by end-to-end anastomosis. No complication was observed during the follow-up. Surgical intervention for upper extremity aneurysms should be initiated without delay in order to prevent extremity ischemia and amputation.

Keywords: Aneurysm; Brachial artery; Infant

1. Introduction

Upper extremity peripheral artery aneurysms are less frequent than lower extremity peripheral artery aneurysms; they are further scarce in the infant age group [1]. Peripheral artery aneurysms located distally to the upper extremity, particularly at the brachial artery level, generally lead to thromboembolic complications of the hand and fingers [2]. Brachial artery aneurysms mostly occur due to iatrogenic causes after trauma and invasive procedures, and are characteristically pseudoaneurysms [3]. In this article, the diagnosis and surgical treatment of idiopathic and isolated true brachial artery aneurysms, which are rarely encountered in the infant age group, has been presented in concert with knowledge of literature.

2. Case presentation

A nine-month-old male infant presented with complaints of a painless swelling with increasing size at the anterior surface of the left elbow, which had been recognized one month before. There were no events of obtuse trauma, penetrating injury, hospitalization or iatrogenic intervention in the medical history. An immobile, pulsatile, 3 × 4 cm mass was palpated at the anterior surface of the left elbow during physical examination (Fig. 1a). The left radial and ulnar pulses were palpable, and the neurologic examination of the anterior arm was normal. Doppler ultrasonography revealed an approximately 30 cm aneurysm with thick walls at the anterior surface of the left elbow, originating from the brachial artery, and a turbulent flow within the aneurysm. Magnetic resonance angiography (MRA) revealed a saccular aneurysmal dilatation originating from the brachial artery just above the left cubital fossa, and measuring approximately 3.5 × 3.2 cm at the widest point (Fig. 1b).

The aorta, pulmonary arteries and the other peripheral arteries were normal. A surgical procedure was performed as follows: under general anesthesia, a 5-cm vertical skin incision was made into the aneurysmatic sac, and a saccular aneurysm originating from the brachial artery and occupying the cubital fossa was identified. The brachial artery was released by dissection above the aneurysmatic sac. The aneurysm was resected by placing vascular clamps on the proximal and distal zones of the brachial artery, which was primary repaired by end-to-end anastomosis using a 7/0 PDS suture. There was no tension in the artery; the radial and ulnar blood flows were pulsatile. Histopathologic examination of the aneurysmal sac during the postoperative period evidenced organized fibrin on the wall of the brachial artery and degenerative arterial sections, which are characteristic of a true aneurysmal formation (Fig. 2). No complication was recorded during postoperative follow-up of the patient; the distal pulses were palpable and there was no neurologic deficit.

3. Discussion

Upper extremity peripheral artery aneurysms most frequently involve the subclavian artery, followed by the axillary, brachial, ulnar and radial arteries, respectively [4]. The prevalence of brachial artery aneurysms has been reported as 0.5%, and they generally develop as a result of trauma and iatrogenic invasive procedures [3]. The current higher prevalence of pseudoaneurysms is attributed to the recurrence of invasive procedures for diagnosis and treat-
Cardiac catheterizations performed for congenital heart diseases, arterial and venous punctures for the evaluation of blood gases, and invasive arterial monitoring are all potential causes of pseudoaneurysms in the pediatric age group. Other causes include infections, vasculitis, and congenital defects. Concomitant Menkes’ disease and brachial artery aneurysm has been reported [6, 7]. Since there was no history of obtuse or penetrated trauma nor invasive interventions, and no specific diagnosis was reached with pathological examination, the aneurysm was designated as idiopathic.

In a study focused on the strategies and results of the diagnosis and treatment of true aneurysms distal to the axillary artery, the most common complaint of the involved 19 subjects was the presence of an asymptomatic mass. This was followed by pain and paresthesia complaints, and complications of thromboembolism were reported in three patients. The mean diameter of the brachial artery aneurysms was 3.5 cm. It was emphasized that the aneurysmal diameter and the thrombus there within, were not associated with complications of thromboembolism. Arterial ligation and aneurysmal resection were performed on half of the 10 patients who underwent surgery, whereas resection, concomitant with arterial reconstruction, was performed on the other half. In this study, considering the minimal morbidity, routine surgical intervention was recommended for the aneurysms [8]. Our case was a nine-month-old patient who presented with an asymptomatic mass. The possibility of subsequent development of symptoms led to surgical intervention, and arterial reconstruction was performed through primary repair. Although no critical extremity ischemia developed in the patient, we would like to suggest that arterial reconstruction should be performed, due to the possibility of lack of strength in the extremity associated with inadequate blood flow during its later use.

Doppler ultrasonography, MRI and selective upper extremity angiography may be performed for the diagnosis of aneurysm [9]. MRA is a preferred method for diagnostic evaluations of pediatric vascular diseases, as a result of its high image resolution capacity, no arterial invasion, and absence of radiation exposure.

In conclusion, true brachial artery aneurysm is a very rarely encountered disorder in infants. Surgical intervention is required due to potential neurologic and extremity ischemic symptoms. Provision of arterial maintenance through primary repair is the ideal procedure.

References