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Case Report

Pseudoaneurysm of the Superficial Temporal Artery in a Pediatric Patient

Pediatrik Bir Hastada Yüzeyel Temporal Arterin Psödoanevrizması

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ABSTRACT

A pseudoaneurysm is a “false aneurysm” that occurs following trauma to a blood vessel and usually presents as a painful, pulsatile mass. Head trauma that causes damage to the superficial temporal artery (STA), a branch of the external carotid artery, may result in a pseudoaneurysm. This is a rare diagnosis and can result in bleeding, paresthesias and facial paralysis if misdiagnosed. The time from trauma to diagnosis varies in the literature, but treatment with surgical resection remains the gold standard. In this case report, we report the diagnosis, management, and treatment of a five-year-old girl presenting with an STA pseudoaneurysm following head trauma.

Keywords: *pseudoaneurysm, superficial temporal artery, trauma, surgery, pediatric surgery*

ÖZET

Psödoanevrizma, bir damar travmasını takiben oluşan ve genellikle ağrılı, nabız alınabilen bir kitle olarak ortaya çıkan “yalancı anevrizma”dır. Eksternal karotid arterin bir dalı olan arteria temporalis superficialis’in (ATS) hasarlandığı kafa travmaları, psödoanevrizmaya yol açabilir. Bu durum oldukça nadir görülür ve yanlış tanı konulması halinde kanama, paresteziler ve fasiyal paralizi gibi ciddi komplikasyonlara neden olabilir. Travma ile tanı arasındaki süre literatürde değişiklik göstermekle birlikte, cerrahi rezeksiyon tedavide altın standart olarak kabul edilmektedir. Bu olguda, kafa travmasını takiben ATS psödoanevrizması gelişen 5 yaşındaki bir hastanın tanı süreci ve tedavisi sunulmuştur.

Keywords: *psödoanevrizma, yüzeysel temporal arter, travma, cerrahi, pediatrik cerrahi*

INTRODUCTION

A pseudoaneurysm, or false aneurysm, is a collection of blood that leaks from a damaged blood vessel, forming a pocket of turbulent blood flow that remains attached to the vessel (1). Pseudoaneurysms most often occur secondary to trauma to a blood vessel and may present as a painful, pulsatile mass (2). Pseudoaneurysms are uncommonly discussed or reported in the pediatric population (3). In the adult population, pseudoaneurysms most commonly occur in the femoral artery following endovascular procedures, while in the pediatric population, the location of pseudoaneurysms varies (3). Given that it is uncommon in this population, the diagnosis is often delayed or even missed. A pseudoaneurysm of the superficial temporal artery

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(STA) is rare in adult and pediatric populations. Since the 17th century, there have been fewer than 400 cases reported in the literature, with the majority due to postoperative complications of craniotomies in the adult population (2,4,5). The STA, a branch off the external carotid artery, is vulnerable to trauma because of its surface location and thin overlying temporalis and frontalis muscles (4). Untreated pseudoaneurysms of any location may enlarge and create pressure on the skin contributing to skin ischemia, necrosis and rupture (1) Additionally, there is a risk of thrombus and embolus due to the turbulent flow within the pseudoaneurysm. A pseudoaneurysm of the STA specifically, may result in facial nerve palsy due to nerve compression and pseudoaneurysm rupture extending intracranially resulting in subdural hemorrhage (6,7). Diagnosis of a pseudoaneurysm is made using clinical exam, ultrasound (US) or computerized tomography angiogram (CTA). The US will show a characteristic bidirectional colored flow pattern, also called the yin-yang or Pepsi sign. The treatment is dependent on location and patient condition but other options include interventional radiology procedures and ultrasound-guided compression therapy (4).

CASE REPORT

A 5-year-old female presented with a left-sided temporal mass following a traumatic injury to the area. The patient had a medical history significant for self-injurious behavior, constant picking at her skin and hair, and acting out by way of physical aggression. The pediatrician had initially diagnosed her with a hematoma but, given that the area did not resolve, she was sent for further evaluation. There appeared to be a well-circumscribed soft tissue mass measuring 2 cm on examination. A US confirmed a hypoechoic lesion measuring 1.4 x 1.0 x 0.6 cm, with half of the lesion demonstrating internal vascular flow extending to the temporal artery consistent with a partially thrombosed left temporal artery pseudoaneurysm (Figure 1). After a thorough discussion with the family and concerns that she would potentially injure the same area again or pick at the skin and cause an infection or bleeding, the decision was made to excise the pseudoaneurysm. Doppler US was used during the excision to identify the proximal and distal blood supplies, which were carefully dissected and ligated. The pseudoaneurysm was dissected free and excised in its entirety without any bleeding (Figure 2). The pseudoaneurysm was sent to pathology and measured 1.5 x 1.0 x 0.6 cm. The lesion was well circumscribed within a fibrotic pseudocapsule, and pathology confirmed thrombosis with recanalization. The patient was discharged on the same day, and the incision healed successfully and without complications.

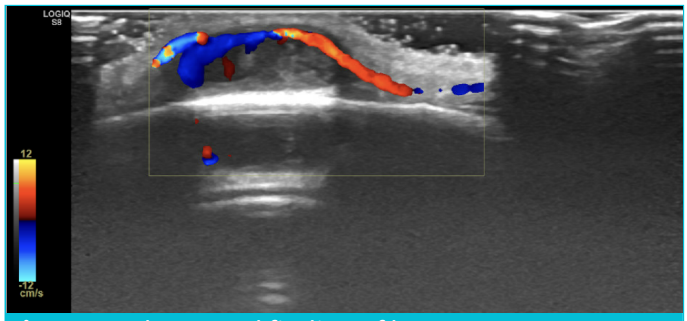

Figure 1. Ultrasound finding of heterogeneous hypoechoic lesion measuring 1.0x0.6x1.4cm demonstrating a partially thrombosed pseudoaneurysm from left temporal artery.

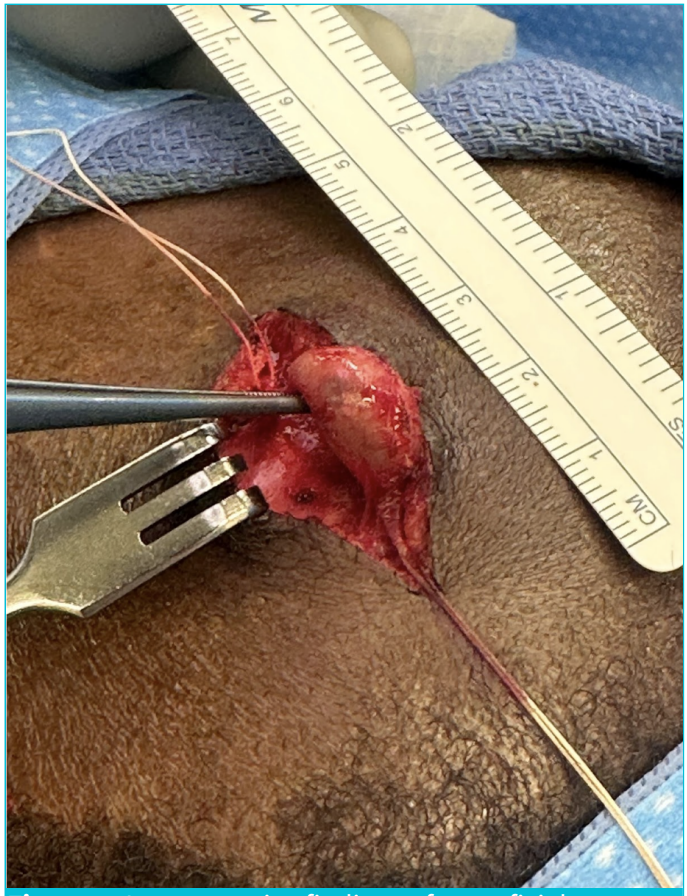

Figure 2. Intraoperative findings of superficial temporal artery.

DISCUSSION

This case describes a rare diagnosis and surgical treatment of a 5-year-old girl with a superficial temporal artery (STA) pseudoaneurysm following head trauma. The formation of an STA pseudoaneurysm is not

common and is especially rare in children. This child had an increased risk of injuries to her face and head due to her behavioral history, which thus contributed to her parents being more assertive in her medical care and seeking out a surgeon for further evaluation. Due to her social situation, we believe she was diagnosed and treated earlier than other children may have been. The index of suspicion for a pseudoaneurysm before resection was also crucial to avoid a potential bleeding complication in the operating room.

The treatment for a pseudoaneurysm varies, depending on size, symptoms and location. Interventional techniques such as ultrasound-guided thrombin injection and ultrasound-guided compression therapy are commonly used because they are uncomplicated, safe, and avoid the need for anesthesia. Ultrasound techniques, however, are more often used for adults with femoral pseudoaneurysms caused by catheterization (4). The effectiveness of US compression varies, with one study showing a 30% failure rate for treating femoral pseudoaneurysms (4). Surgical repair is less common in the adult population with the surge in interventional techniques and is normally reserved for cases that have failed interventional treatment. However, surgical management is more common in the pediatric population due to the difference in pathology (lack of femoral catheterization). The decision for resection in this patient was due to the location of the pseudoaneurysm, as well as the patient's history and parental preference for definitive treatment.

Although rare, maintaining a broad differential diagnosis for temporal swelling especially after a traumatic injury is imperative. The STA is vulnerable due to its surface location and the thin protection from overlying temporalis and frontalis muscles. The complications of STA are reported in few case studies and include skin ischemia and necrosis, thrombus formation, facial nerve palsy, and intracranial rupture causing a subdural. As these are most commonly misdiagnosed as either an abscess or hematoma, proceeding with incision and drainage without the appropriate preoperative diagnosis could result in severe bleeding. This case highlights a rare diagnosis within the pediatric population and emphasizes the importance of preoperative workup with imaging and appropriate surgical management.

Patient Consent Form / Hasta Onam Formu

The parents' of this patient consent was obtained for this study.

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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