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An Unusual Cause of a Temporal Mass in a Pediatric Patient: Superficial Temporal Artery Pseudo Aneurysm

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Abstract **Case Report**

Post-traumatic pseudoaneurysm of the superficial temporal artery is an uncommon cause of temporal mass in children. Recognizing its vascular origin is essential before any invasive procedure. A 12-year-old boy presented with a painless, progressively enlarging, pulsatile left preauricular mass over two months following local trauma. High-frequency ultrasonography demonstrated a vascular outpouching along the superficial temporal artery, with internal arterial flow and peripheral avascular material suggestive of mural thrombus. CT angiography demonstrated an enhancing outpouching, with peripheral non-enhancing material, supporting a partially thrombosed pseudoaneurysm. The lesion was excised after ligation of three feeding vessels. Histopathology described an altered, thrombosed arterial wall without malignancy. This case illustrates the value of Doppler ultrasonography for recognizing a vascular temporal mass and of selective CT angiography for anatomical assessment. Imaging recognition can prevent hazardous aspiration or biopsy and guide surgical referral.

Keywords: Superficial temporal artery, pseudoaneurysm, Doppler ultrasonography, CT angiography, pediatric trauma.

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INTRODUCTION

Superficial temporal artery (STA) pseudoaneurysm is an uncommon delayed complication of local trauma and has been reported in children [1,2]. Its superficial location makes it vulnerable to injury, and a gradually enlarging pulsatile temporal mass should prompt vascular assessment [3]. Doppler ultrasonography can identify the perfused sac, associated thrombus and communication with the parent artery [4]. We report a pediatric case with ultrasound and CT angiographic correlation, emphasizing the imaging findings that support diagnosis and the distinction between specific and nonspecific Doppler signs.

CASE REPORT

A 12-year-old boy presented with a progressively enlarging left preauricular mass over two months following local trauma.

Examination demonstrated a firm, painless, pulsatile subcutaneous temporal mass without inflammatory or infectious signs.

Ultrasonography, performed using a high-frequency linear transducer, revealed a well-defined oval vascular outpouching along the left STA, measuring 11 × 5 mm. Color Doppler showed internal turbulent arterial flow; spectral Doppler demonstrated a high-resistance arterial waveform. A heterogeneous echogenic peripheral, avascular component, reported as 3 mm thick, suggested mural thrombosis. The superficial temporal artery maintained a normal caliber and morphology, with preserved arterial flow on color Doppler imaging (Figure 1).

Craniofacial CT angiography was subsequently performed for further characterization, showed a circumscribed, oval-shaped vascular outpouching within the soft tissues of the left temporal region, along the course of the superficial temporal artery. The lesion was isoattenuating on unenhanced images and showed intense enhancement during the early arterial phase, measuring 7.5 × 5.5 mm. A peripheral non-enhancing component, measuring 1.5 mm in thickness, was consistent with mural thrombosis. (Figure 2)

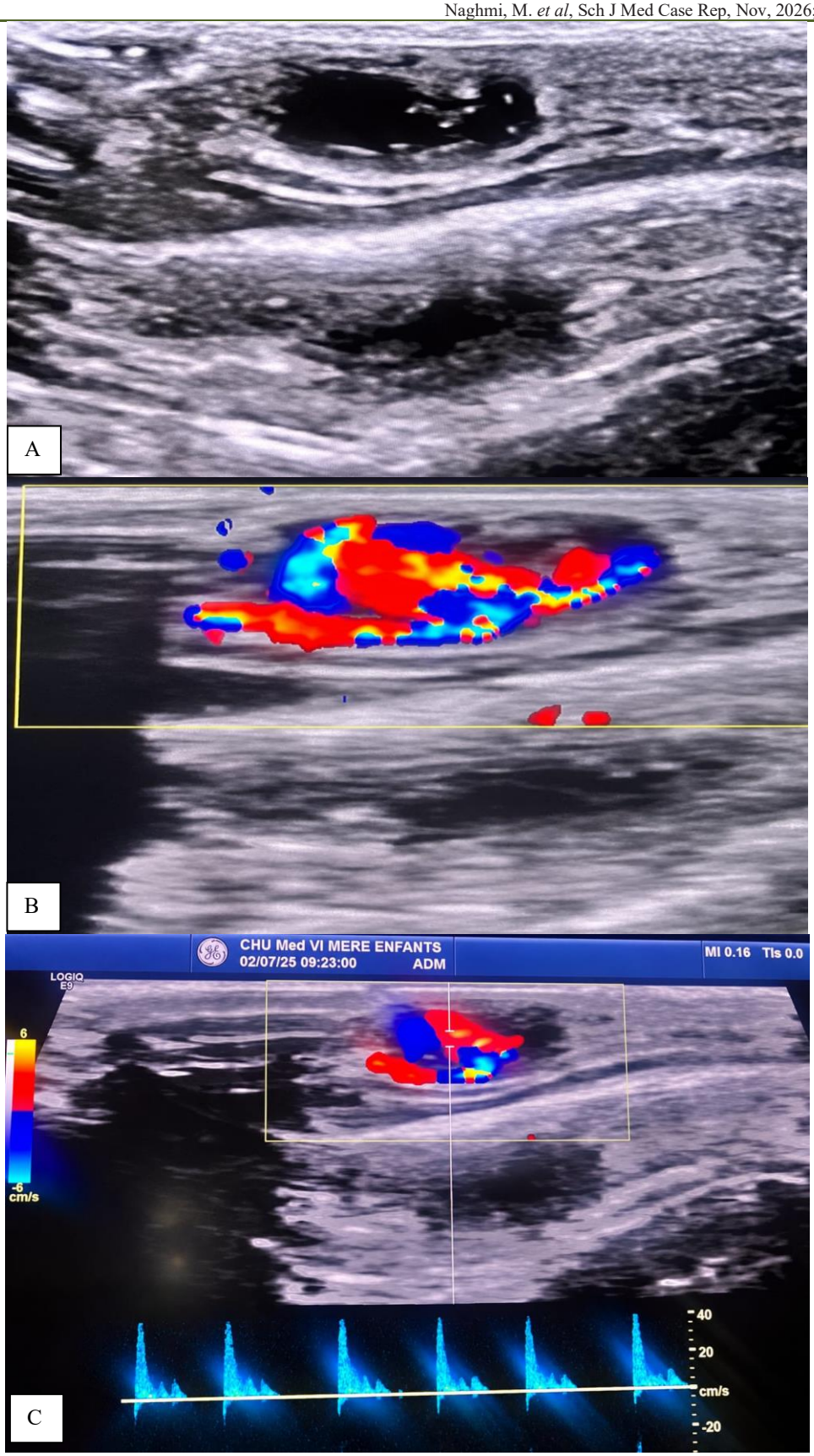


Figure 1. Ultrasound of the left temporal mass. (A) B-mode image shows a superficial, predominantly anechoic oval lesion with peripheral echogenic material. (B) Color Doppler demonstrates internal flow, "yin-yang" sign. (C) Spectral Doppler demonstrates a high-resistance arterial waveform; this does not document the characteristic to-and-fro waveform at a pseudoaneurysm neck

CT angiographic findings

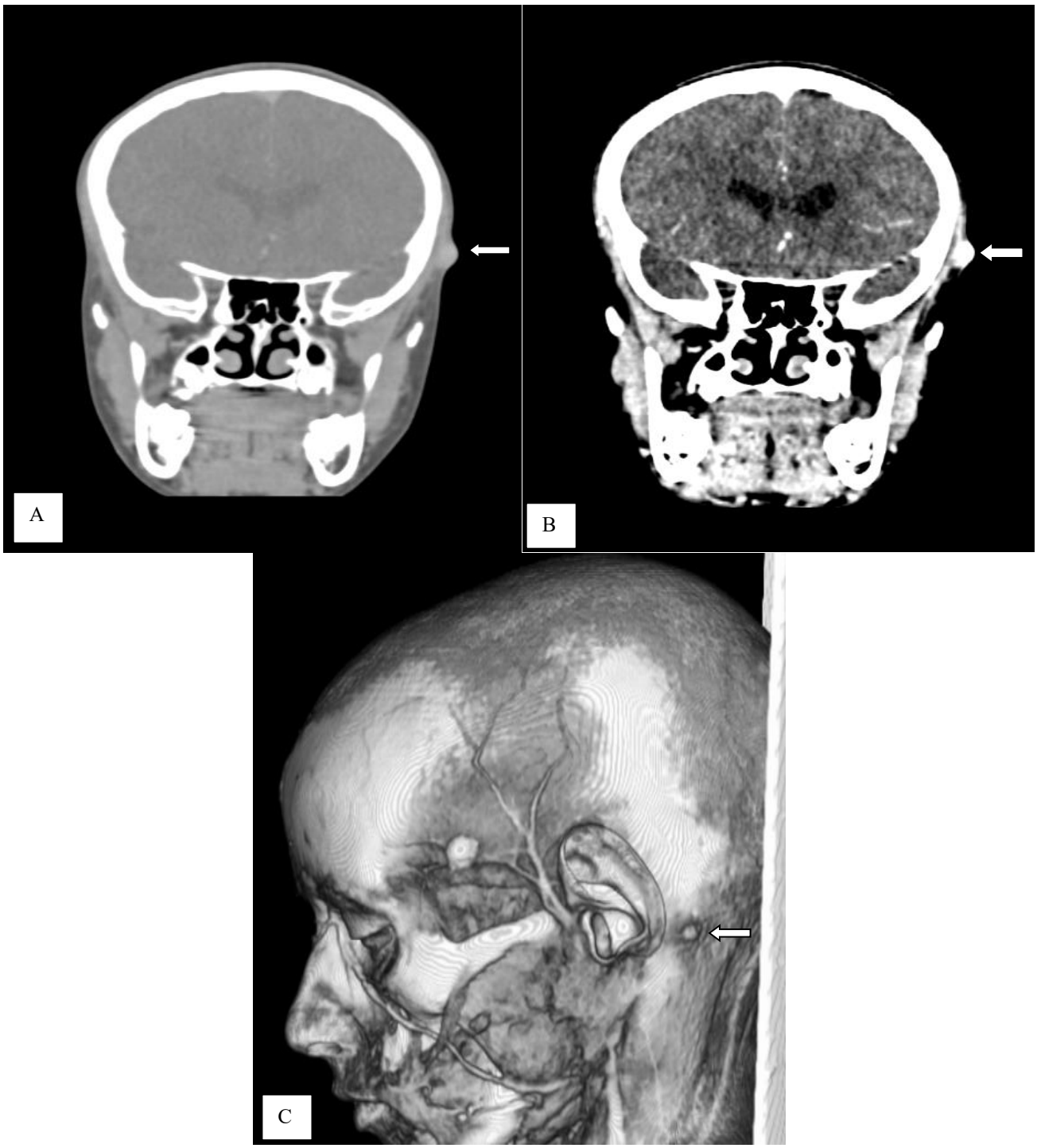


Figure 2: CT assessment of the left temporal lesion. (A, B) Contrast-enhanced cranial CT with coronal reformations demonstrates a pseudoaneurysm of the left superficial temporal artery with peripheral mural thrombus. (C) Three-dimensional CT angiographic reconstruction showing the superficial temporal artery pseudoaneurysm in a left lateral view

Surgical management: The maxillofacial surgery team excised the lesion after ligation of three feeding vessels (Figure 3A).

Histopathological examination revealed a firm, brownish nodular lesion weighing 1 g and measuring 1.5 × 0.6 × 1 cm, containing central friable material. (Figure 3B).

Microscopic examination demonstrated a structurally altered and thrombosed arterial wall, without specific histopathological features or evidence of malignancy. (Figure 4).

Operative and pathological correlation

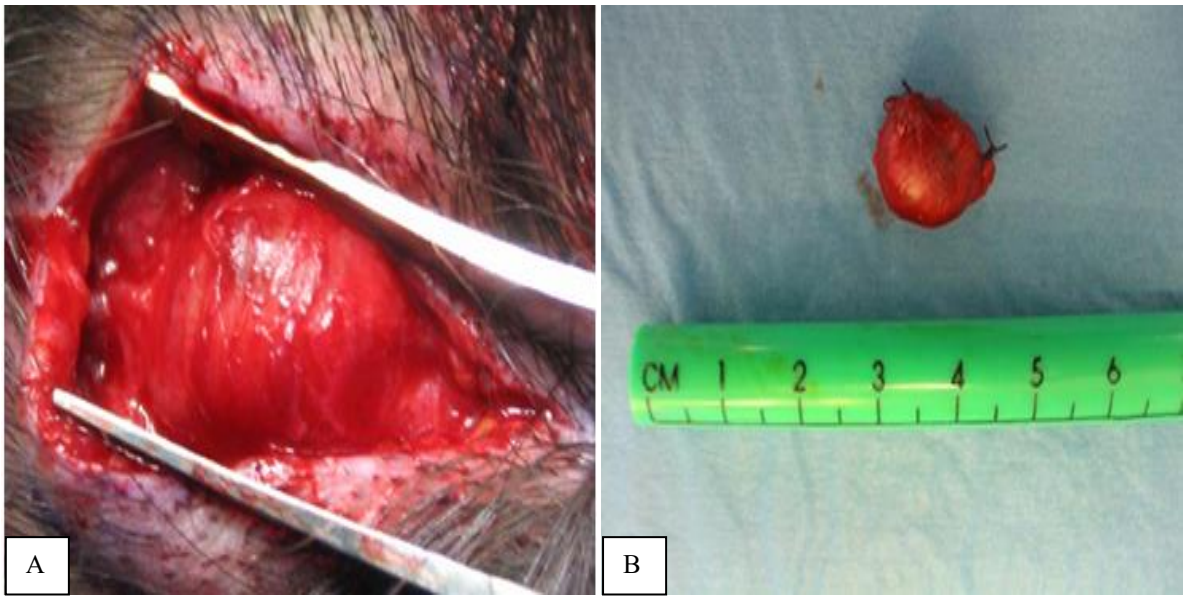


Figure 3: (A) Operative exposure of the superficial temporal arterial lesion. (B) Gross specimen after ligation and excision

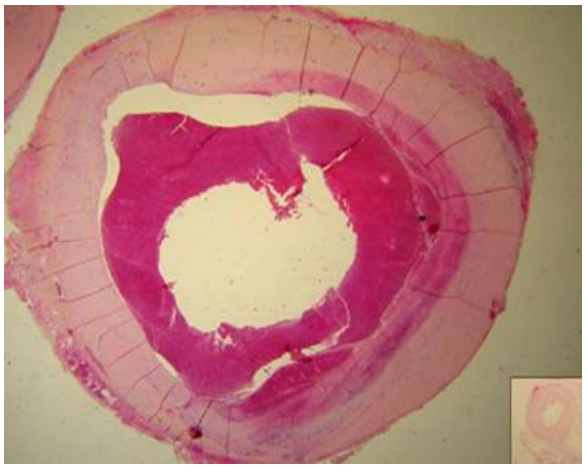


Figure 4: Histological image supplied with the case of the superficial temporal artery pseudoaneurysm stained with hematoxylin, eosin, and saffron (HES): altered arterial wall with thrombosis and no malignancy

DISCUSSION

Superficial temporal artery (STA) aneurysms are rare vascular lesions, particularly in the pediatric population. Most post-traumatic lesions are pseudoaneurysms resulting from disruption of the arterial wall following blunt trauma. The superficial course of the STA, particularly its frontal branch, makes it especially vulnerable to injury [1-3,5].

Clinically, these lesions typically present as a progressively enlarging, painless, pulsatile temporal mass, usually within 2–6 weeks after trauma, although delayed presentations have been reported. Associated symptoms may include throbbing headaches, dizziness, visual disturbances, auditory discomfort, or localized paresthesia [3,5]

Doppler ultrasonography is the first-line imaging modality, particularly in children, owing to its accessibility and lack of ionizing radiation [4,6]. It typically demonstrates a well-defined vascular lesion communicating with the parent artery, turbulent bidirectional flow producing the characteristic yin-yang sign on color Doppler, and a to-and-fro waveform at the pseudoaneurysm neck on spectral Doppler [4,7]. Partial intraluminal thrombosis may also be observed [4,6].

CT angiography provides complementary anatomical information, particularly regarding lesion size, vascular origin, and relationships with adjacent structures, and is useful for preoperative planning in selected cases [8].

The differential diagnosis includes hematoma, epidermoid cyst, lipoma, vascular malformation, and

other arterial aneurysms. Recognition of the vascular nature of the lesion is essential to avoid potentially life-threatening hemorrhage during inappropriate aspiration, biopsy, or surgical exploration [4,8].

Surgical excision following proximal and distal arterial ligation remains the reference treatment, generally providing excellent outcomes without requiring vascular reconstruction owing to the extensive collateral circulation of the scalp [3,5]. Alternative approaches include endovascular coil embolization, ultrasound-guided thrombin injection, and compression therapy in selected patients [5,9,10].

Histopathologically, pseudoaneurysms are characterized by disruption of the arterial wall with formation of a blood-filled cavity contained by surrounding fibrous tissue, unlike true aneurysms, which retain all three arterial wall layers [6,8].

Early diagnosis and appropriate management are essential to prevent complications, including progressive enlargement, compression of adjacent structures, skin compromise, and potentially severe hemorrhage following rupture [5,6,9].

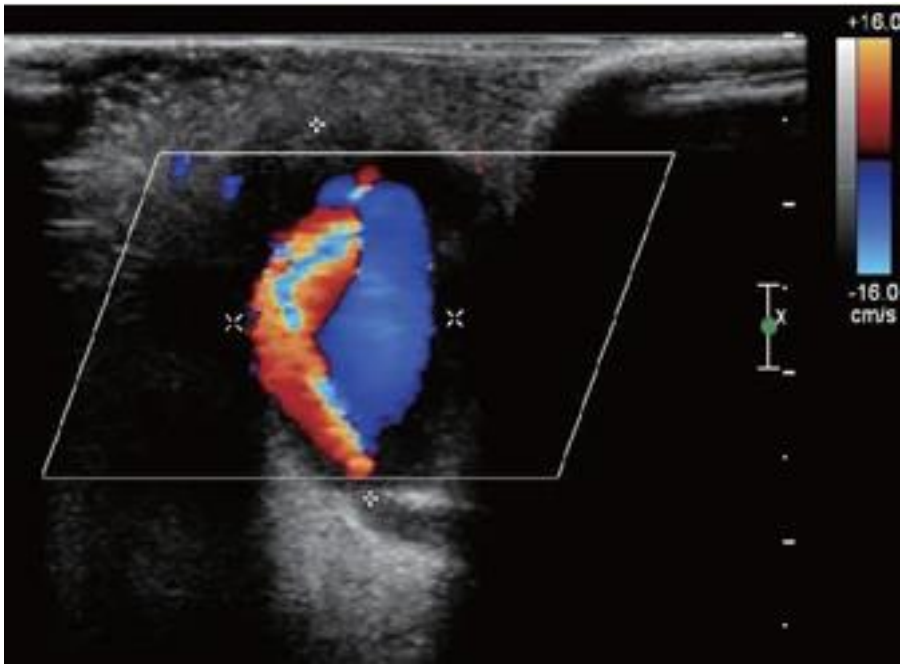


Figure 7: Color Doppler ultrasonographic image demonstrating the characteristic "yin-yang" sign, reflecting bidirectional turbulent blood flow within the pseudoaneurysm sac.

CONCLUSION

A delayed pulsatile temporal mass after trauma should raise suspicion of STA pseudoaneurysm. Doppler ultrasonography identifies the vascular sac and thrombus; neck-specific spectral assessment strengthens the diagnosis. Selective CT angiography can clarify anatomy before treatment. Recognizing the vascular nature of the lesion is essential before any invasive procedure.

DECLARATIONS

Conflicts of interest: The authors declare no conflicts of interest.

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