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# Superficial Temporal Artery Pseudoaneurysm Diagnosed by Point-of-Care Ultrasound

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## CASE PRESENTATION

A 55-year-old female presented to the emergency department with an enlarging forehead mass after a fall with head injury two weeks prior. She reported focal, tender swelling to her right forehead and headache. Physical examination revealed a two-centimeter, soft, pulsatile mass to her right frontotemporal region (Image 1). Point-of-care ultrasound (POCUS) with color Doppler revealed a dilated vascular structure with pulsatile, bidirectional flow – the “yin-yang” sign (Image 2). The diagnosis of traumatic superficial temporal artery (STA) pseudoaneurysm was confirmed by computed tomography (CT) angiography with three-dimensional reconstruction (Image 3). The patient’s pseudoaneurysm was surgically ligated and she recovered uneventfully.

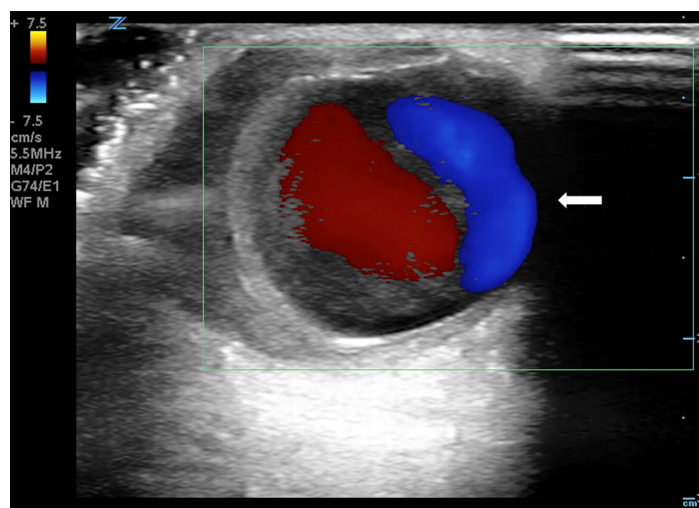
## DISCUSSION

Traumatic pseudoaneurysm of the STA is a rare complication of minor head trauma, usually presenting as a painless pulsatile mass following blunt trauma.<sup>1</sup> Pseudoaneurysms are contained only by the external adventitial layer of the vessel wall, and are more likely to rupture than true aneurysms.<sup>2</sup> Complications may include persistent headache, continued enlargement, dizziness, vision changes and, rarely, life-threatening hemorrhage.<sup>3</sup> Diagnosis is typically made by history and physical examination, and confirmed by Doppler ultrasonography<sup>2</sup> or CT angiography, although diagnosis by POCUS has been reported.<sup>2,4,5</sup>

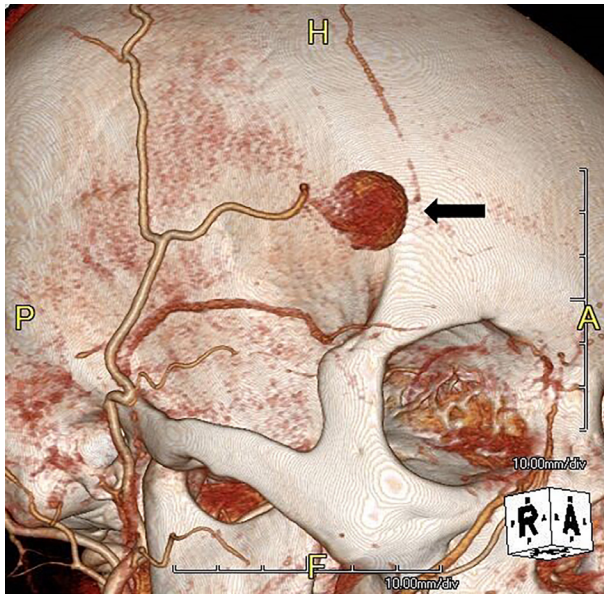
POCUS can differentiate common causes of focal, superficial swelling such as skin and soft tissue infection from underlying vascular pathology, preventing potentially disastrous attempts at



**Image 1.** Photograph of right superficial temporal arterial pseudoaneurysm (arrow).



**Image 2.** Point-of-care Doppler ultrasound demonstrating the classic “yin-yang” sign (arrow), indicating bidirectional blood flow within the pseudoaneurysm.



**Image 3.** Three-dimensional computed tomography angiogram demonstrating a large superficial temporal arterial pseudoaneurysm (arrow).

bedside drainage and expediting referral for definitive therapy.<sup>5,6</sup> Color Doppler indicates blood flow velocity and direction relative to the probe, although high velocities may show an apparent reversal of color flow due to aliasing. The red-blue, “yin-yang” pattern seen here is due to the continuously changing angle of insonation caused by swirling blood flow.

In summary, we report a case in which POCUS provided a rapid, accurate diagnosis of an uncommon complication following minor head trauma requiring surgical intervention. An “ultrasound-first” approach to focal swelling, particularly with recent head trauma, can expedite appropriate care and avoid unnecessary or potentially harmful interventions.

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### CPC-EM Capsule

What do we already know about this clinical entity?  
*Superficial temporal artery (STA) pseudoaneurysm is a rare complication of minor head trauma. Diagnosis is typically made via color Doppler ultrasound or computed tomography angiography.*

What is the major impact of the images?  
*Point-of-care ultrasound (POCUS) with color Doppler assists in the diagnosis of STA pseudoaneurysm, as well as in undifferentiated soft tissue swelling.*

How might this improve emergency medicine practice?  
*POCUS can expedite diagnosis and definitive therapy of STA pseudoaneurysm and help avoid harmful bedside interventions.*

Documented patient informed consent and/or Institutional Review Board approval has been obtained and filed for publication of this case report.

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