Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Thrombosed and Infected Sinus Pericranii: A Case Report

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DOI: https://doi.org/10.36347/sjmcr.2026.v14i11.063 | **Received:** 17.09.2026 | **Accepted:** 13.11.2026 | **Published:** 17.11.2026

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Abstract | **Case Report**

Sinus pericranii is a rare venous anomaly characterized by an abnormal communication between the extracranial venous circulation and the intracranial dural venous sinuses. Although usually presenting as a scalp mass, it may occasionally be complicated by thrombosis. Its atypical presentations can pose diagnostic challenges, particularly when orbital structures are involved. A 7-year-old child presented with left eyelid swelling. Contrast-enhanced computed tomography demonstrated a crescent-shaped superolateral extraconal lesion measuring up to 18 mm in maximal thickness, with heterogeneous enhancement. The lesion abutted the ipsilateral lateral rectus muscle and lacrimal gland, both of which appeared mildly enlarged and intensely enhancing. An adjacent cortical bone defect was associated with two vascular-appearing channels extending toward the ipsilateral temporal pole medially and the infiltrated, swollen palpebrotemporal subcutaneous tissues laterally. Mild proptosis (grade I) was also noted. The globe had a normal morphology, the intraconal fat was preserved, and the cavernous sinus remained opacified. The patient received antibiotic therapy. This case highlights an unusual orbital presentation of a suspected complicated sinus pericranii. Recognition of the combination of an enhancing extraconal lesion, a calvarial defect, and transosseous vascular channels is important in suggesting an underlying venous anomaly. Dedicated venous imaging may be required to characterize the venous communication and establish the presence and extent of thrombosis.

Keywords: Sinus Pericranii, Thrombosis, Infection, Orbit, Computed Tomography, Magnetic Resonance Imaging, Pediatric Radiology.

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INTRODUCTION

Sinus pericranii is an uncommon venous anomaly characterized by an abnormal communication between extracranial venous structures and the intracranial dural venous sinuses through transosseous emissary veins [1,2]. It most frequently presents as a painless scalp swelling and is commonly identified during childhood. Although its clinical presentation is often benign, accurate anatomical characterization is essential because the lesion may participate in intracranial venous drainage [1, 2].

Computed tomography (CT) is useful for demonstrating associated calvarial defects and transosseous channels, whereas magnetic resonance imaging (MRI) and MR venography help assess the lesion's soft-tissue extent and its relationship to intracranial venous structures [1-3]. Thrombosis is a recognized complication that may alter the usual clinical and imaging appearance of sinus pericranii [4].

We report an unusual presentation in a 7-year-old child with left eyelid swelling and an enhancing superolateral extraconal lesion associated with a bone defect and vascular-appearing channels, raising suspicion of a thrombosed and superinfected sinus pericranii.

CASE PRESENTATION

A 7-year-old child was referred for radiological evaluation of left eyelid swelling. Contrast-enhanced CT and MRI examinations were performed.

CT demonstrated a crescent-shaped lesion in the superolateral extraconal space, measuring up to 18 mm in maximal thickness. The lesion was spontaneously isodense and exhibited heterogeneous enhancement following intravenous contrast administration.

The lesion abutted the ipsilateral lateral rectus muscle and lacrimal gland, which appeared mildly enlarged and showed intense post-contrast enhancement. A focal cortical bone defect was identified adjacent to the

lesion, associated with two vascular-appearing channels suggestive of possible emissary veins. Medially, the lesion extended to the vicinity of the ipsilateral temporal pole. Laterally, the channels communicated or appeared to extend toward the ipsilateral palpebrotemporal subcutaneous tissues, which were swollen, infiltrated, spontaneously hyperdense, and intensely enhancing after contrast administration.

Mild grade I proptosis was present. The globe maintained a normal morphology, and the intraconal fat was preserved. The cavernous sinus remained opacified.

Taken together, these findings raised suspicion of a sinus pericranii with associated thrombosis and superimposed infection. The child received antibiotic therapy. The therapeutic approach consisted of systemic antibiotic therapy and anticoagulation, combined with close clinical surveillance and serial assessment of the patient's clinical status.

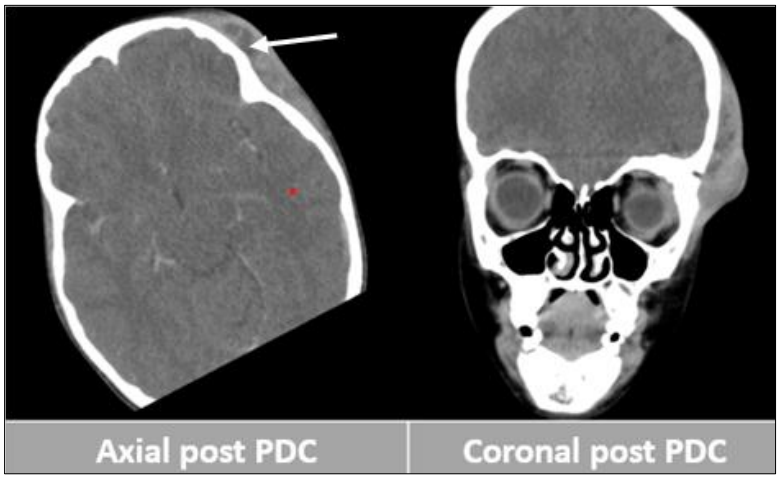


Figure 1: CT demonstrated a crescent-shaped lesion in the superolateral extraconal space, measuring up to 18 mm in maximal thickness. The lesion was spontaneously isodense and exhibited heterogeneous enhancement following intravenous contrast administration.

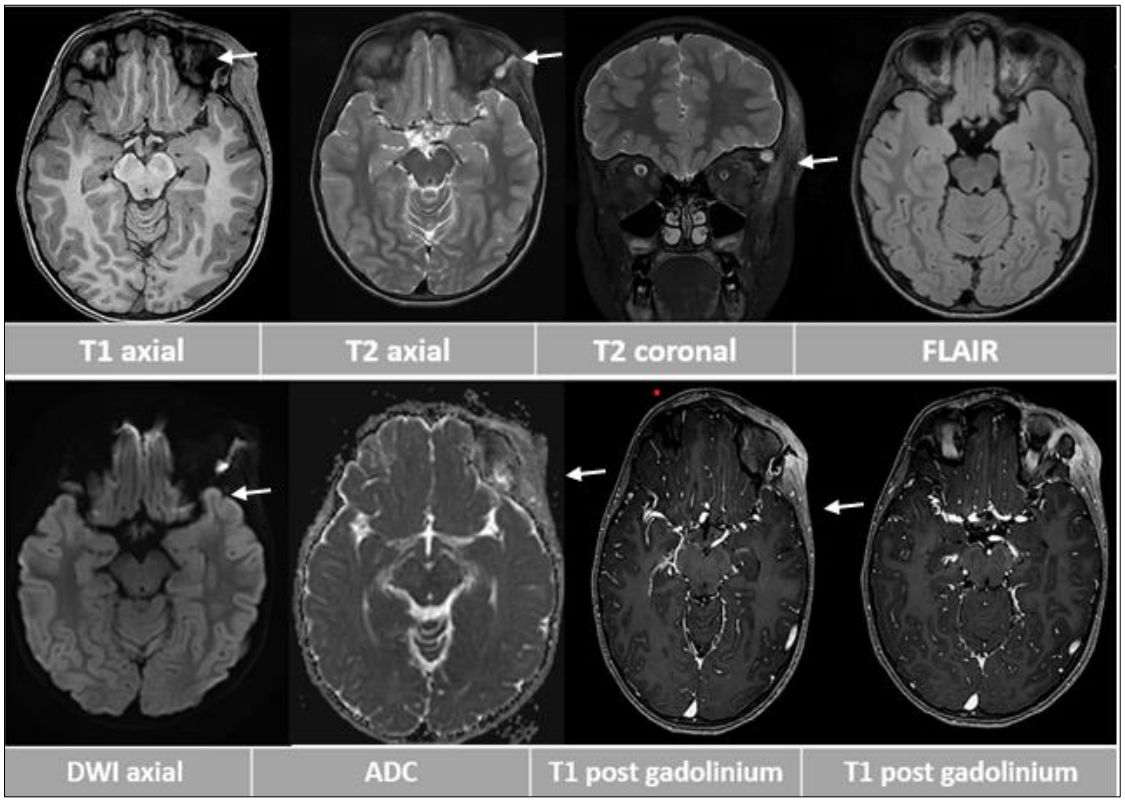


Figure 2: MRI ajouter commentaire

DISCUSSION

Sinus pericranii represents an abnormal venous connection between extracranial and intracranial venous systems through transosseous channels. Its diagnosis relies on recognizing the vascular nature of the lesion and demonstrating its relationship to the skull and intracranial venous drainage [1, 2].

In the present case, the combination of a focal bone defect, vascular-appearing channels, and an enhancing extracranial lesion supports consideration of a venous anomaly. The unusual superolateral orbital location and associated eyelid swelling broaden the clinical presentation beyond the more typical scalp mass. Previous reports have documented atypical lateral locations and orbital extension, emphasizing the importance of cross-sectional imaging in establishing the anatomical diagnosis [2-5].

Thrombosis may substantially modify the imaging appearance of sinus pericranii. Carpenter *et al*., described two cases of spontaneous partial thrombosis in which CT venography demonstrated filling defects within the venous varicosities; MRI did not clearly depict the thrombus in one case [4]. Therefore, heterogeneous enhancement alone is insufficient to confirm thrombosis. Assessment of the lesion's enhancement pattern, intraluminal filling defects, and venous flow on dedicated CT venography or MR venography may be necessary.

The surrounding soft-tissue infiltration and swelling, together with intense enhancement of the adjacent lacrimal gland and lateral rectus muscle, raise concern for an associated inflammatory process. However, these findings are not specific for infection. Clinical evidence of infection, inflammatory markers, microbiological results when available, and the presence or absence of a drainable collection should be correlated with the imaging findings before classifying the lesion as superinfected.

The preserved intraconal fat, normal globe morphology, and continued opacification of the cavernous sinus are important findings to document. They describe the extent of the orbital abnormality and the structures involved at the time of imaging. However, cavernous sinus opacification alone does not exclude all forms of venous complications.

Management of sinus pericranii should be individualized according to symptoms, venous anatomy, and the lesion's role in intracranial venous drainage [1, 2]. In this patient, antibiotic therapy was initiated. Further treatment decisions and follow-up findings cannot be reported without additional clinical information.

This case illustrates the diagnostic value of identifying a bone defect and transosseous vascular channels in a child presenting with an atypical orbital lesion. Confirming the venous communication and evaluating for thrombosis are essential steps in establishing the diagnosis and planning appropriate management.

CONCLUSION

Sinus pericranii should be considered in the differential diagnosis of an atypical enhancing cranio-orbital lesion associated with a calvarial defect and vascular-appearing transosseous channels. In a child presenting with eyelid swelling, CT and MRI provide complementary information regarding bone involvement, orbital extension, and adjacent soft-tissue changes. Dedicated venous imaging is particularly valuable when thrombosis is suspected. Clinical and laboratory correlation remains necessary to establish superinfection.

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