



Distinctive Contrast Enhancement Pattern in Orbital Cavernous Hemangioma: A Diagnostic Case Report

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Abstract

Cavernous hemangioma of the orbit (CHO) is a rare vascular tumor predominantly affecting middle-aged females. While benign, CHO can cause significant visual impairment and ocular motility disturbances. This diagnostic case report presents a 34-year-old female patient with a 7-month history of declining vision in her left eye. Magnetic resonance imaging (MRI) revealed a lesion in the left superior orbital fissure region, displaying T1 hypointensity and T2 hyperintensity. Dynamic contrast-enhanced MRI showcased a distinctive enhancement pattern originating from a solitary point, suggestive of CHO. Surgical excision confirmed the presence of hemangioma. This report contributes to the understanding of CHO's diagnostic criteria and underscores the utility of contrast enhancement patterns in its identification.

Keywords: Cavernous Hemangioma of the Orbit (CHO); Magnetic Resonance Imaging (MRI)

Introduction

Cavernous hemangioma of the orbit (CHO), while rare, comprises a notable portion of orbital tumors and predominantly affects females in their fourth to fifth decade of life. This slow-growing vascular tumor significantly impacts visual function and ocular motility, emphasizing the importance of precise diagnosis and consideration of various therapeutic options, including less invasive approaches [1].

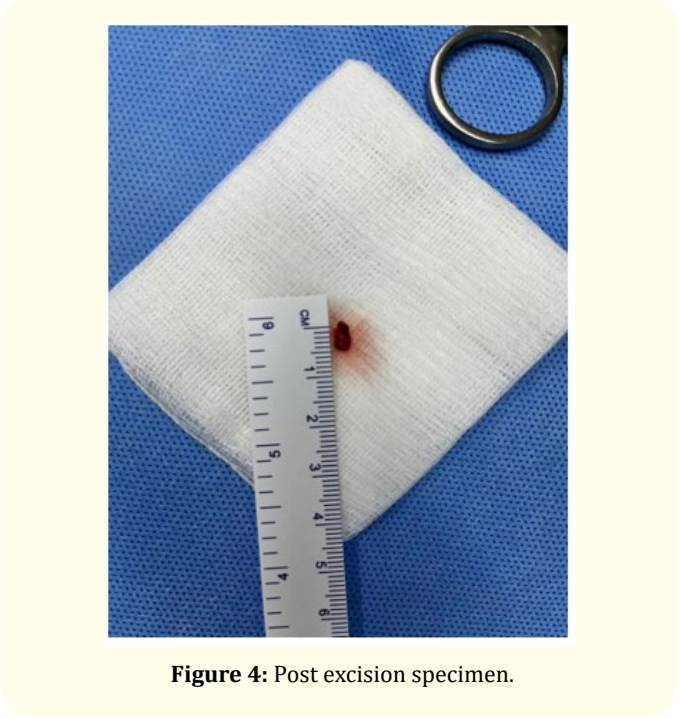
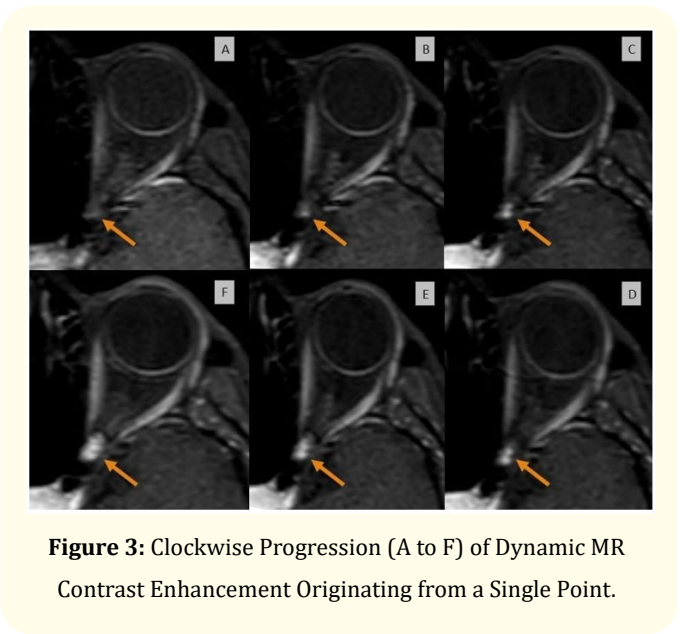
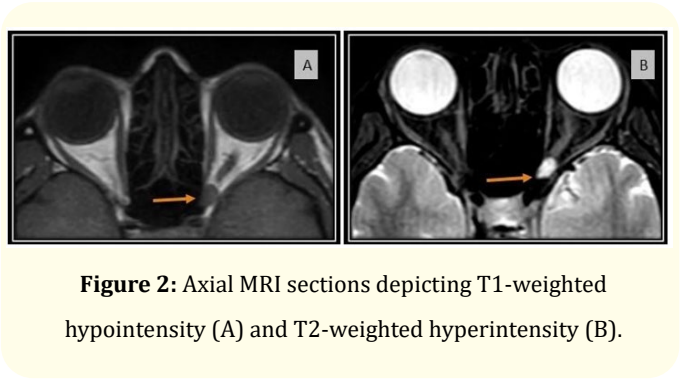
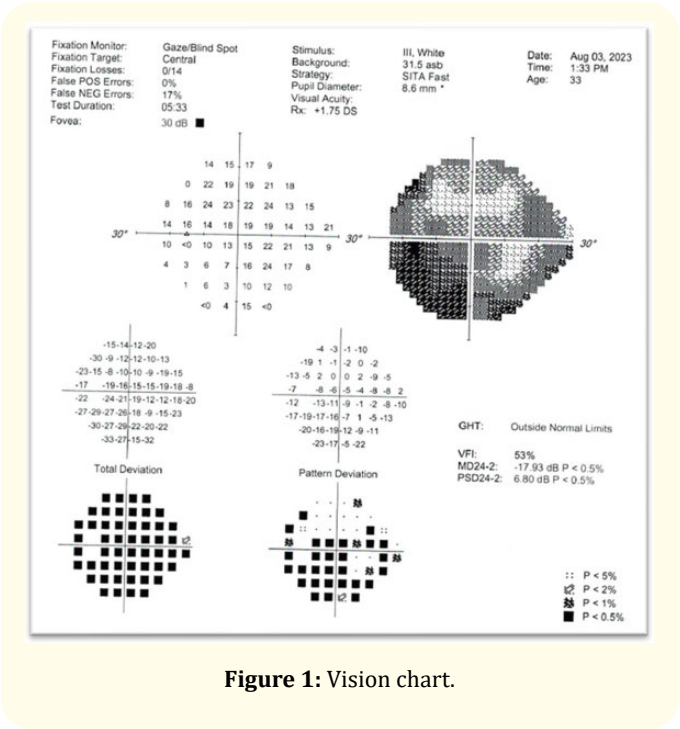
CHO, often found incidentally during clinical evaluations, demand a thorough understanding of their characteristics and behaviors. As these tumors exert a lasting influence on ocular health, a comprehensive grasp of their diagnostic criteria and treatment strategies becomes imperative. This case report delves into the diagnostic journey of a 34-year-old female patient who

presented with progressive vision loss in her left eye over seven months. We aim to contribute to the expanding body of knowledge surrounding cavernous hemangiomas of the orbit, highlighting the diagnostic significance of contrast enhancement patterns.

Case Presentation

A 34-year-old female patient presented with complaints of declining vision in her left eye, a progressive issue she had been experiencing for the past 7 months (Figure 1). An MRI examination revealed a well-defined lesion in the left superior orbital fissure region, measuring 8 x 5 mm, which exhibited T1 hypointensity and T2 hyperintensity (Figure 2). This lesion was located intraconally. Upon performing a dynamic contrast study, the lesion displayed a unique pattern of progressive contrast filling, originating from a solitary point (Figure 3) — a finding indicative of an orbital

cavernous hemangioma. Notably, the lesion exerted pressure on the left optic nerve near the orbital apex. Subsequently, the patient underwent a transnasal endoscopic excision of the tumor. Intraoperatively, a small, reddish, soft lesion was observed in the orbital apex, compressing the orbital nerve. A complete excision of the lesion was successfully performed (Figure 4). Histopathology reports subsequently confirmed the diagnosis of hemangioma.



Discussion

Cavernous hemangioma while typically presenting as a solitary and unilateral condition, predominantly affects the left orbit, although instances of multiple and bilateral occurrences have been documented [2].

It may develop at diverse orbital sites, with the middle third of the orbit, specifically the intraconal space adjacent to the optic nerve, being the most common location. This propensity for the middle third could be linked to the vascular nature of the tumor, possibly influenced by the arterial supply in this region, while the preference for the left orbit remains unknown [3].

Distinguishing between hemangiomas and schwannomas in lesions situated in this anatomical region is often challenging. However, a study conducted by Tanaka A., *et al.* [4] shed light on a differentiating factor. Specifically, during the initial phase of enhancement, all cavernous hemangiomas exhibited a striking enhancement pattern characterized by initiation from a specific point or portion of the tumor, while schwannomas presented enhancement that emanated from a broader area. In our case, the dynamic contrast study unequivocally displayed progressive contrast enhancement originating from a solitary point, strongly suggesting the diagnosis of a cavernous hemangioma.

The correlation between the primary point of enhancement and the tumor's feeding vessels, as highlighted in previous studies [5], reaffirms the significance of this distinct contrast enhancement pattern as a hallmark of cavernous hemangiomas. This insight further emphasizes the utility of dynamic contrast-enhanced MRI in the comprehensive evaluation of orbital lesions.

Conclusion

Our case report contributes to the expanding body of knowledge concerning the diagnostic criteria for orbital cavernous hemangiomas, with a particular focus on the utility of contrast enhancement patterns as a valuable diagnostic tool. Precise diagnosis and consideration of various therapeutic approaches, including minimally invasive interventions, are essential in managing this slow-growing vascular tumor effectively.

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