Optic Nerve Sheath Meningocele: A Case Report and Review of the Literature

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Abstract

Optic nerve sheath meningocele is a rare dilatation of the perioptic cerebrospinal fluid space. A 16-year-old patient presented with painless right proptosis. CT showed a well-defined hypodense lesion in the right intraconal orbit with displacement of the extraocular muscles and no bone erosion. MRI showed a 19 × 23 × 21 mm lesion closely related to the optic nerve, with cerebrospinal fluid signal characteristics, no appreciable enhancement and anterior displacement of the globe. The imaging findings were consistent with an optic nerve sheath meningocele.

Keywords: Optic nerve sheath, meningocele, CT, MRI.

Introduction

Optic nerve sheath meningocele is a rare dilatation of the cerebrospinal fluid space around the optic nerve [1,2,3]. Bane described primary dilatation of the optic nerve sheath in 1918. Garrity and colleagues reported the clinical and radiographic features of 13 patients [4,8]. The underlying mechanism is uncertain. Proposed explanations include altered fluid dynamics in the perioptic subarachnoid space and congenital narrowing at the cranio-orbital junction [2,3,7]. Symptoms vary, and blurred vision or retrobulbar discomfort have been reported [2,4].

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Case Presentation

A 16-year-old patient presented to an external emergency department with painless right proptosis. The case report records no history of head trauma or additional neurological deficits.

CT demonstrated a well-defined hypodense right retrobulbar lesion with displacement of the extraocular muscles and no bone expansion or erosion (Figure 1). MRI showed a thin-walled 19 × 23 × 21 mm right intraconal lesion closely related to the optic nerve. The lesion followed cerebrospinal fluid signal, showed no appreciable enhancement after contrast administration and displaced the globe anteriorly (Figure 2).

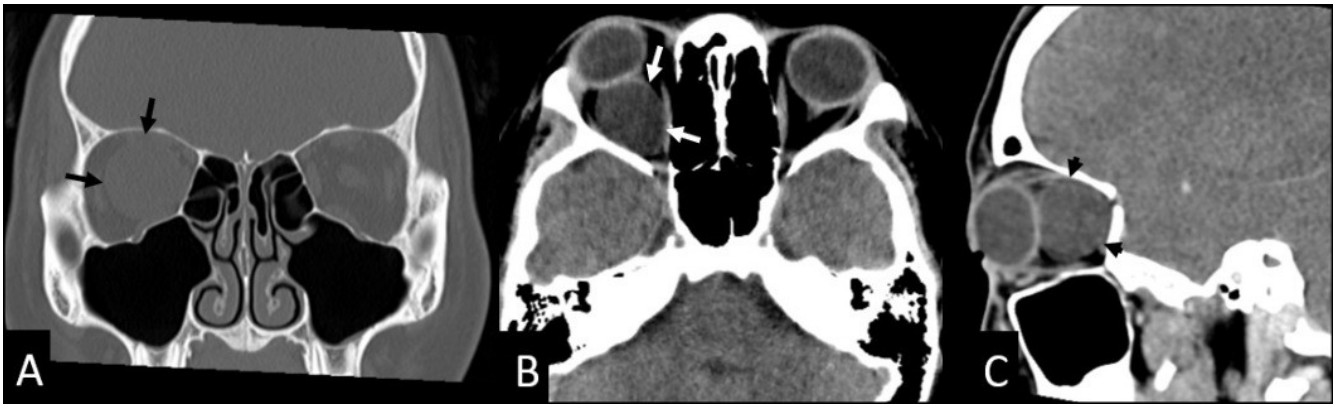


Figure 1. CT of the right orbit. (A) Bone window shows no bone expansion or erosion. (B) Soft-tissue window shows a well-defined hypodense intraconal lesion with displacement of the extraocular muscles. (C) Contrast-enhanced image shows no appreciable enhancement.

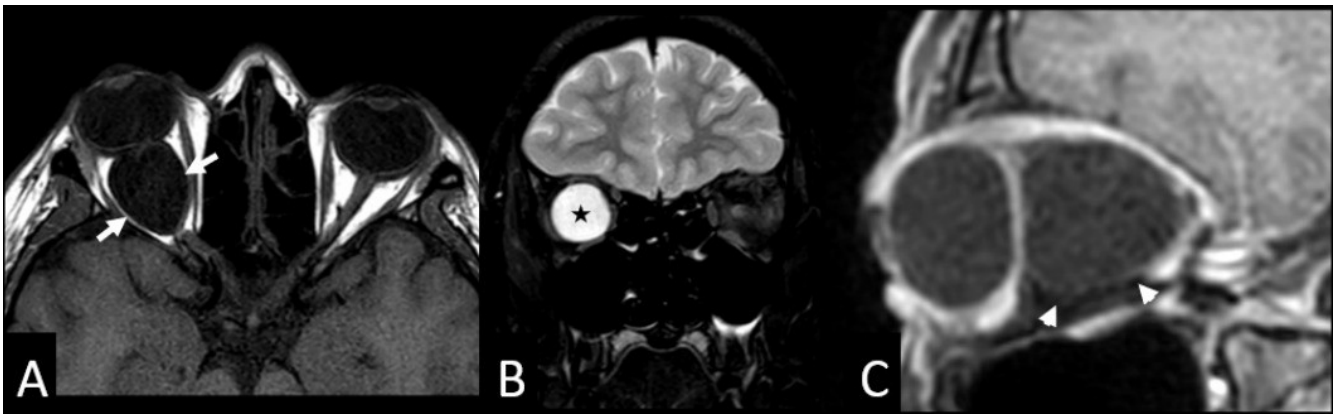


Figure 2. MRI of the right orbit. (A) T1-weighted image shows a hypointense retrobulbar lesion with anterior globe displacement. (B) T2-weighted image shows fluid signal matching cerebrospinal fluid. (C) Postcontrast image shows no appreciable enhancement.

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Discussion

The perioptic location, cerebrospinal fluid signal and absence of appreciable enhancement supported the imaging diagnosis. The differential diagnosis of an enlarged optic nerve–sheath complex includes intrinsic optic nerve lesions, sheath tumours and secondary perioptic cerebrospinal fluid distension. [2,3,4,5,6,8]

Orbital MRI can delineate the cerebrospinal fluid space around the optic nerve. Coronal T2-weighted images may show a ring of fluid around the nerve, and fat-suppressed sequences can help characterize adjacent orbital structures [3,4,8].

Published reports describe observation in stable cases, use of acetazolamide in selected cases and surgical decompression in selected patients with progressive visual impairment. Management in the literature varies with the clinical presentation and visual course [1,2,3,5,6,7,8].

Conclusion

In this case, the combination of perioptic location, cerebrospinal fluid signal and absence of appreciable enhancement supported the imaging diagnosis of optic nerve sheath meningocele.

Declarations

The authors report written informed consent for publication and preservation of patient anonymity. The work followed the Declaration of Helsinki and applicable standards. Both authors contributed to the conception and drafting or critical revision, approved the final manuscript and agreed to be accountable for the work.

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References

1. Morello A, Bianconi A, Cogoni M, Borgarello S, Garbossa D, Micon BM. Bilateral idiopathic optic nerve sheath meningocele: A case report and literature review. J Neurosci Rural Pract. 2022 Oct-Dec;13(4):781-784. Epub 2022 Nov 2. PMID: 36743743; PMCID: PMC9894007. https://doi.org/10.25259/JNRP_5_2022

2. Catalán-Coronado S, Parrado-Carrillo A, Nogués-Castell J, Rosinés-Fonoll J, Camós-Carreras A, Alcubierre R, Carrión-Donderis MT, Bernal-Morales C, Sánchez-Dalmau B. Case report: Bilateral optic nerve sheath meningocele: clinical aspects. Front Ophthalmol (Lausanne). 2024 May 8;4:1385485. PMID: 38984125; PMCID: PMC11182330. https://doi.org/10.3389/fopht.2024.1385485

3. Mesa-Gutiérrez JC, Quiñones SM, Ginebreda JA. Optic nerve sheath meningocele. Clin Ophthalmol. 2008 Sep;2(3):661-8. PMID: 19668771; PMCID: PMC2694015. https://doi.org/10.2147/opth.s2689

4. Algarni M, Maralani PJ, Sundaram AN. Optic nerve sheath meningocele. Int Med Case Rep J. 2018 Sep 10;11:213-215. PMID: 30237744; PMCID: PMC6136404. https://doi.org/10.2147/IMCRJ.S166655

5. Chaves MRGD, Queiroga IBW, Chaves MAPD, Gadelha FM, Vieira DA. Retro-orbital tumor suggestive of optic nerve sheath meningocele. Rev Bras Oftalmol. 2015;74(4):248-50. https://doi.org/10.5935/0034-7280.20150051

6. Meher, Ravi, Anoop Raj, Pankaj Vats, Deepti Vats, S Dadeya and Ashok Kumar Gupta. Endoscopic Management of Optic Nerve Sheath Meningocele. Clinical Rhinology An International Journal (2009): 63-65. https://doi.org/10.5005/jp-journals-10013-1015

7. Lunardi P, Farah JO, Ruggeri A, Nardacci B, Ferrante L, Puzzilli F. Surgically verified case of optic sheath nerve meningocele: case report with review of the literature. Neurosurg Rev. 1997;20(3):201-205. https://doi.org/10.1007/BF01105565

8. Garrity JA, Trautmann JC, Bartley GB, et al. Optic nerve sheath meningoceles. Clinical and radiographic features in 13 cases with a review of the literature. Ophthalmology. 1990;97(11):1519-1531. https://doi.org/10.1016/S0161-6420(90)32382-5

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