Surgical Management of Convexity Meningioma-en-plaque: A Systematic Literature Review

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Introduction

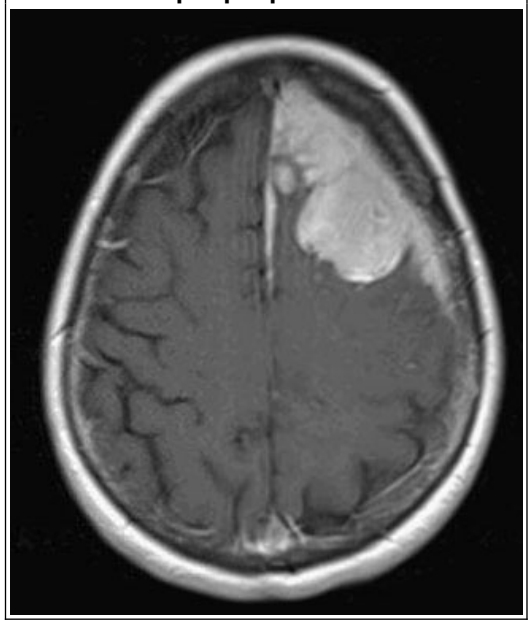
Meningiomas-en-plaque (MEP), first coined by Cushing in 1922, comprise 2.5% of all meningiomas. While they typically arise in the sphenoid wing, convexity MEP's are comparatively rare and are often confused with meningeal sarcoidosis, osteoma, tuberculoma, and fibrous dysplasia with very little information published in the literature.

Methods

We conducted a literature review on PubMed of English-only articles using a keyword search. All studies that described reports of convexity MEP were reviewed for patient demographics, presenting symptoms, radiological reports, surgical management, recurrence rates, histopathological presentation, post-operative complications, and follow up. This resulted in twelve papers comprising twenty-two cases of convexity MEP.

Flow chart describing selection process for relevant studies

Figure 1: Magnetic resonance imaging (MRI) of convexity meningioma en-plaque patient



Results

Seventeen (77%) of the 22 patients were female with average age of 53.2 years. Intitial presenting symptoms included headache 12/20 (60%), hemiparesis 5/20 (25%), and visual symptoms 1/20 (5%). Of the 14 patients that underwent surgical resection, only four were reported as gross total resection. Twelve cases had pathology reports associated with all 12 tumors graded as WHO Grade I.

Table 1: Twelve reviewed papers with brief demographics and the extent of description

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Paper	YoP	Country	Described tumor	Described indications for surgery	Described pathology	Described surgical procedure	Described followup
Akutsu	2004	Japan	Yes	Yes	Yes	Yes	Yes
Doyle	1972	USA	Yes	Yes	No	Yes	No
Gay	2005	France	Yes	No	No	No	No
Gupta	2006	India	Yes	Yes	Yes	Yes	Yes
Kim KS	1987	USA	Yes	No	No	No	No
Kim SM	2006	Korea	Yes	Yes	Yes	Yes	Yes
Nakagawa	1980	Japan	Yes*	Yes*	No	Yes*	Yes*
Park	2006	Korea	Yes	Yes	Yes	Yes	Yes
Seckin	2006	Turkey	Yes	Yes	Yes	Yes	No
Skuna	1993	Thailand	Yes	Yes	Yes	Yes	No
Toledo	1973	Israel	Yes	Yes	Yes	Yes	No
Tsutsumi	2013	Japan	Yes	No	Yes	Yes	No

*Article described only 1 of the 3 convexity MEPs listed in the body of the paper

Conclusions

Convexity MEP, while rare, present a challenge with regard to correct diagnosis and subsequent resection. The easier accessibility of these meningiomas predicts higher surgical success rates and incidence of total resection, though care must be taken to ensure gross removal of tumor, dural attachments, and any overlying hyperostotic bone. Though hyperostosis is frequently observed with this variant of meningioma, it is neither exclusive or wholly indicative of MEP. Due to its rarity in both clinical practice and the literature, further studies are warranted to identify modern imaging means to correctly diagnose this condition.

Table 3: Convexity Meningioma-En-Plaque (MEP) Symptomatology

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Symptom	Patient Count
Headache	12
Hemiparesis/paresis	5
Facial palsy	2
Seizures	2
Painless lump/mass	2
Decreased vision/visual field abnormality	1

Learning Objectives

By the conclusion of this session, participants should be able to: 1) appreciate the rarity of convexity MEP, 2) ensure proper diagnosis of convexity MEP to guide appropriate treatment.

Table 2: Twelve reviewed papers with descriptions of tumor size, location, pathology, and extent of resection, where included

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Paper	Age/Sex	Tumor Size	Tumor Location	Pathology	Resection
Akutsu	48F	---	Frontoparietal	Meningothelial without anaplasia	Subtotal
Doyle	43F	4cm x 5cm x 1-2mm	Left frontoparietal	---	Total
Gay	45F	---	Convexity, longitudinal sinus	---	---
	46F	---	Convexity, right occipital	---	---
Gupta	32M	---	Biparasagittal from frontal to occipital	Meningothelial with bony invasion	Subtotal
Kim KS	47M	---	Frontoparietal near coronal suture	---	---
	37F	---	Frontoparieto-temporal	---	---
	40F	---	Frontoparietal near coronal suture	---	---
	90F	---	Frontoparieto-occipital	---	---
Kim SM	44F	---	Frontoparietal	Transitional without anaplasia	Subtotal
Nakagawa	63M	---	Bilateral parasagittal	---	Subtotal
	76F	---	Unilateral parasagittal	---	---
	74M	---	Unilateral parasagittal	---	---
Park	72F	---	Left frontal	Transitional (WHO Grade I)	Subtotal
Seckin	71F	---	Bifrontal	Meningothelial	Total
Skuna	45F	5.5cm x 4-9mm	Right frontoparietal	Meningothelial	Total
Toledo	63M	5cm x 3mm	Left frontoparietal	Meningothelial	---
	44F	4cm	Left frontoparietal	Fibroblastic	---
	37F	5cm x 3mm	Right frontal	Fibroblastic	---
	48F	3cm x 5mm	Left frontoparietal	Fibroblastic	---
	39F	3cm x 3mm	Left frontal	Fibroblastic	---
Tsutsumi	67F	16x13x5 mm	Left parietal	Meningothelial (WHO Grade I)	Total