

Scalp Swelling Caused by Extracranial Extension of Meningioma

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Abstract

Head lumps are a common presentation in clinical practice and, in most cases, are benign and require no further investigation. However, rarer and potentially serious pathologies should be considered, particularly when a scalp lesion is associated with new neurological symptoms. We report an unusual case of an intracranial meningioma with extensive calvarial involvement and extracranial extension presenting as a longstanding scalp lump.

A 45-year-old man presented to hospital following an episode of collapse associated with jerky movements, raising suspicion of a seizure. He had a longstanding, asymptomatic scalp lump that had been present for 18 years. Neuroimaging revealed a parasagittal meningioma with extensive involvement of the calvarium and transcalvarial extension into the scalp. The patient underwent surgical excision of the meningioma along with craniectomy and primary titanium cranioplasty, with histopathology confirming a World Health Organization (WHO) grade 1 meningioma. He made a good postoperative recovery and remained seizure-free at the one-year follow-up.

Although most head lumps are benign, this case highlights the importance of maintaining a broad differential diagnosis, particularly when a longstanding lesion is associated with new neurological symptoms. Meningiomas with extracranial extension are rare but should be considered in patients presenting with a scalp mass and an underlying calvarial abnormality. Timely imaging and appropriate neurosurgical management can facilitate diagnosis and treatment and may result in favorable neurological outcomes.

Categories: Family/General Practice, Internal Medicine, Neurosurgery

Keywords: craniotomy, extra-cranial extension, meningioma, scalp swelling, seizures

Introduction

In 1922, Harvey Cushing introduced the term “meningioma” to describe tumours arising from the meninges, the membranous layers that surround the brain and spinal cord. Since then, meningiomas have been increasingly diagnosed and are now the most common primary intracranial tumours [1-3]. They are more prevalent in females, with a female-to-male ratio of 2:1, particularly among individuals in their 40s and 60s [2,4]. Traditionally, owing to their indolent nature, asymptomatic meningiomas were monitored, and treatment was considered only if they enlarged or caused a neurological deficit secondary to vasogenic oedema and mass effect. The main drawback of this approach is that, by the time neurological difficulties were noticed, surgical resection became difficult, potentially resulting in incomplete resection and neurological deficits [4].

Meningiomas usually arise from arachnoid cap cells and are predominantly intracranial, with extracranial meningiomas being rare (incidence of 1%-2%) [5,6]. Intracranial meningiomas can extend through the skull into the scalp, presenting as a visible or palpable scalp lump. Such presentations may pose diagnostic challenges, as the scalp swelling may mimic a benign lesion [2,3]. We report the case of a 45-year-old man who had an asymptomatic scalp lump for 18 years before presenting with a seizure and being diagnosed with a World Health Organization (WHO) grade 1 meningioma associated with an expansile osseous lesion and histologically confirmed bone invasion.

Case Presentation

A 45-year-old man who was generally fit and well presented to hospital following an episode of collapse. He initially reported feeling dizzy and experiencing left leg weakness while reversing his car. Bystanders subsequently found him lying on the road outside his car, unresponsive, with laboured breathing and jerky limb movements, prompting them to call an ambulance. On admission, he appeared confused and was unable to recall the events surrounding the collapse. His vital signs were within normal limits, and his Glasgow Coma Scale (GCS) score was 15. Cardiovascular, respiratory, cranial nerve, and peripheral neurological examinations were otherwise unremarkable. Physical examination revealed a firm, immobile,

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and non-tender scalp mass overlying the right frontoparietal region. His electrocardiogram demonstrated normal sinus rhythm. A post-ictal state following a possible seizure was initially suspected.

A CT head demonstrated a $31 \times 31 \times 38$ mm contrast-enhancing extra-axial mass lesion in the right frontoparietal region, associated with low-attenuation oedema, localised mass effect, and up to 7 mm of midline shift (Figure 1). A feeding vessel appeared to enter the lesion. There was no evidence of intracranial haemorrhage or hydrocephalus, although the lateral ventricles appeared narrow. In addition, there was a $60 \times 18 \times 60$ mm expansile osseous lesion centered on the right coronal and sagittal sutures, with central hypodensity, directly overlying and in contact with the intracranial mass.

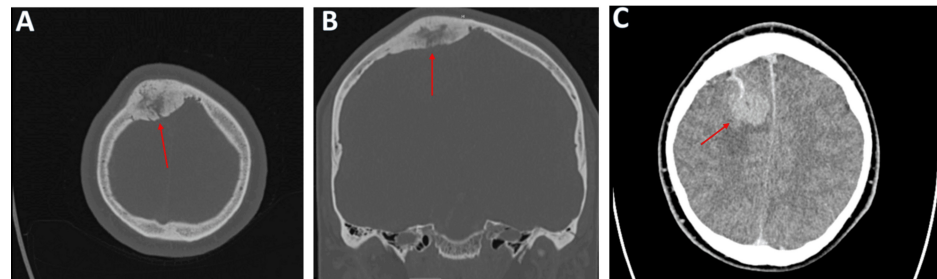


FIGURE 1: CT scan of the meningioma. (A) Axial bone-window image showing the meningioma and adjacent skull involvement (arrow). (B) Coronal bone-window image showing the meningioma and adjacent skull involvement (arrow). (C) Tissue window with contrast showing the enhancing meningioma (arrow).

Following recovery from the post-ictal phase, the patient reported a recent reduction in near vision over several weeks. He also reported that he had first noticed a lump on his scalp approximately 18 years previously. The lump had remained asymptomatic. On the day of admission, he had experienced difficulty getting out of his car and felt light-headed before losing awareness of subsequent events until waking in the ambulance approximately one hour later.

MRI of the head demonstrated a large right frontal paramedian lesion measuring approximately $4 \times 3.6 \times 3$ cm. The lesion appeared extra-axial, with a broad dural base. It demonstrated low T1 signal and heterogeneous high T2 signal (Figure 2). There was mild restricted diffusion and moderate contrast enhancement, with a central non-enhancing component. Surrounding vasogenic oedema and minor midline shift were present, without evidence of raised intracranial pressure. There was associated abnormality of the overlying right frontal bone. Fundoscopy did not demonstrate obvious papilloedema.

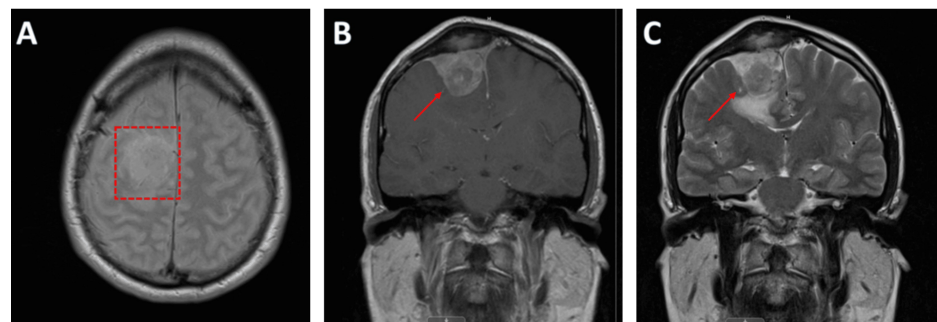


FIGURE 2: MRI scan of the patient. (A) Axial plane showing the tumour in situ, highlighted by the red dashed box. (B) Coronal T1-weighted MRI demonstrating the parasagittal meningioma (red arrow). (C) Coronal T2-weighted MRI demonstrating the meningioma (red arrow).

The patient was initially commenced on dexamethasone for the associated vasogenic oedema and referred for urgent neuro-oncology multidisciplinary team discussion. The radiological appearances were considered consistent with a meningioma, and dexamethasone was subsequently discontinued. He was discharged for neurosurgical follow-up and commenced on levetiracetam 500 mg twice daily.

Treatment

One month after presentation, the patient underwent a complex craniotomy. On raising the scalp flap, a hyperostotic/interosseous meningioma was identified. The involved bone was removed piecemeal using a drill, and a craniotomy was performed to expose the superior sagittal sinus.

Intraoperatively, the tumour was found to have eroded the dura immediately to the right of the midline. The findings were consistent with a parasagittal meningioma with extensive interosseous extension and possible involvement of the superior sagittal sinus. The interosseous and parasagittal components were resected. A small residual volume of tumour was left in the region of the superior sagittal sinus because of the involvement of this structure.

The resulting skull-vault defect was reconstructed using a primary titanium cranioplasty. The patient's postoperative recovery was uncomplicated. Postoperative CT of the head and venography demonstrated satisfactory appearances.

Outcome and follow-up

Histopathological examination confirmed a WHO grade 1 meningioma invading bone tissue (Figure 3). At one-year follow-up, the patient remained clinically well, with no further seizures while taking levetiracetam. The patient continues to undergo annual MRI surveillance to assess for any evidence of progression of the small residual tumour adjacent to the superior sagittal sinus.

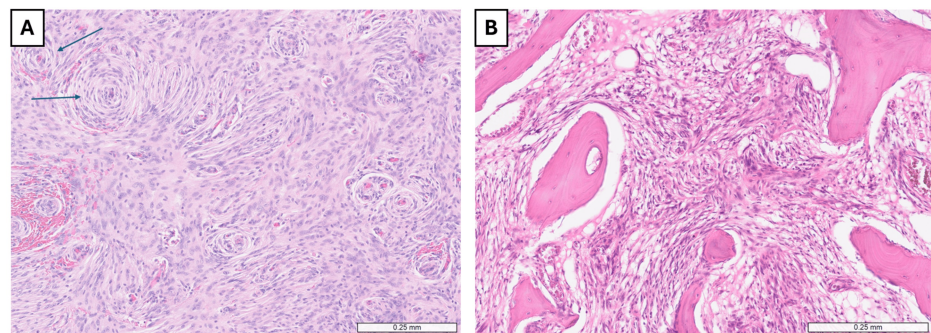


FIGURE 3: (A) Haematoxylin and eosin (H&E) stain at x100 magnification demonstrating whorls of meningotheial cells (arrows). (B) Haematoxylin and eosin (H&E) stain at x100 magnification demonstrating meningioma within the intertrabecular spaces of bone.

Discussion

We report a rare case of an intracranial meningioma with extracranial extension, presenting as a longstanding scalp swelling that was diagnosed following collapse and suspected seizures. In a large single-centre study of 7,084 consecutively operated meningiomas, extracranial locations were uncommon [7]. Consequently, scalp swellings caused by meningiomas may be misdiagnosed as more common benign lesions, including epidermal or pilar cysts, lipomas, and osteomas [8,9].

The differential diagnosis of a scalp swelling is broad and should consider the lesion's duration, progression, consistency, mobility, and associated symptoms [10,11]. Common benign causes include epidermal and pilar cysts, pilomatrixoma, dermatofibroma, and lipoma. Other possibilities include inflammatory and vascular lesions, while squamous cell carcinoma, Merkel cell carcinoma, atypical fibroxanthoma, and soft tissue sarcomas should be considered when concerning features are present. Congenital and osseous lesions, including dermoid cysts, encephaloceles, meningoceles, osteomas, and Langerhans cell histiocytosis, may also present similarly [8,12]. Although most scalp swellings are benign, persistent or progressive lesions warrant appropriate assessment to avoid delayed diagnosis of significant pathology [10,13].

In our patient, the longstanding, painless swelling initially suggested a benign process. However, imaging demonstrated an osteolytic calvarial lesion with transcalvarial extension into the scalp, consistent with an underlying intracranial meningioma. CT is useful for characterising bony involvement, while MRI delineates the intracranial extent and relationship to adjacent structures [2]. The diagnosis was established only after neurological symptoms developed, approximately 18 years after the swelling was first noted. This illustrates the potential for an indolent tumour to remain unrecognised until expansion or involvement of adjacent structures produces clinical manifestations [2,3,9,14,15].

Meningiomas arise from arachnoid cap cells, and extracranial involvement may occur through primary development from ectopic arachnoid cells or secondary extension of an intracranial tumour [2,16]. Other proposed mechanisms include arachnoid cells within nerve or vascular sheaths and ectopic arachnoid tissue deposited during embryological development [17,18]. Associations with neurofibromatosis type 2, radiation exposure, viral infection, and sex hormone abnormalities have also been reported [9,15]. In this case, the parasagittal location, calvarial destruction, and extracranial extension favour a secondary aetiology, although the precise mechanism cannot be established with certainty.

Although not all meningiomas require treatment, the development of seizures and collapse in this patient supported surgical resection. This case emphasises the importance of maintaining a broad differential diagnosis for scalp swellings and pursuing appropriate imaging when calvarial abnormalities or neurological symptoms are present. Early recognition and appropriate management may reduce diagnostic delay and facilitate favourable clinical outcomes.

Conclusions

This case demonstrates the rare presentation of an intracranial meningioma with extensive calvarial and extracranial extension as a longstanding scalp lump. Although most painless and stable scalp swellings are benign, clinicians should maintain an appropriate differential diagnosis when a lesion is associated with neurological symptoms or underlying bony abnormality. A new seizure, collapse, neurological deficit, or other unexplained neurological symptom in a patient with a longstanding scalp mass should prompt consideration of intracranial or calvarial pathology. Cross-sectional imaging, particularly CT and MRI, can establish the extent of the lesion and guide multidisciplinary management.

In this patient, surgical resection and reconstruction resulted in a favourable outcome, with no further seizures reported at one-year follow-up. A small residual tumour remains adjacent to the superior sagittal sinus, and the patient continues to undergo annual MRI surveillance to monitor for tumour progression or recurrence.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

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References

1. Cushing H: The meningiomas (dural endotheliomas): their source, and favoured seats of origin . *Brain*. 1922, 45:282-316. [10.1093/brain/45.2.282](https://doi.org/10.1093/brain/45.2.282)
2. Ali AN, Travers K, Athavale N, Al-Modaris F: Malignant meningioma - a rare cause of temporal head lump . *QJM*. 2014, 107:833-5. [10.1093/qjmed/hcs009](https://doi.org/10.1093/qjmed/hcs009)
3. Nadarajan V, Goddin J, Luder D, Doshi A: An unusual bump on the head. Intraextracranial meningioma presenting incidentally. *BMJ Case Rep*. 2012, 2012:bcr0320126134. [10.1136/bcr.03.2012.6134](https://doi.org/10.1136/bcr.03.2012.6134)
4. Mendenhall WM, Friedman WA, Amdur RJ, Foote KD: Management of benign skull base meningiomas: a review. *Skull Base*. 2004, 14:53-60. [10.1055/s-2004-821364](https://doi.org/10.1055/s-2004-821364)
5. Neeff M, Baysal E, Homer J, Gillespie J, Ramsden R: Intracranial/extracranial meningioma arising in the

- hypoglossal canal: case report. *Skull Base*. 2007, 17:325-30. [10.1055/s-2007-986437](https://doi.org/10.1055/s-2007-986437)
6. Whicker JH, Devine KD, MacCarty CS: Diagnostic and therapeutic problems in extracranial meningiomas. *Am J Surg*. 1973, 126:452-457. [10.1016/S0002-9610\(73\)80029-7](https://doi.org/10.1016/S0002-9610(73)80029-7)
 7. Wang DJ, Xie Q, Gong Y, et al.: Histopathological classification and location of consecutively operated meningiomas at a single institution in China from 2001 to 2010. *Chin Med J (Engl)*. 2013, 126:488-93.
 8. Zamproni LN, Brenner C, Andrade F, Cardeal D, Cardeal M: An unusual scalp mass in a 29-year-old woman. *Int J Case Rep Images*. 2018, 9:100960-01. [10.5348/100960Z01LZ2018CL](https://doi.org/10.5348/100960Z01LZ2018CL)
 9. Kim JH, Kim YJ, Kim H, Nam SH, Choi YW: A rare case of transitional meningioma. *Arch Plast Surg*. 2015, 42:375-7. [10.5999/aps.2015.42.3.375](https://doi.org/10.5999/aps.2015.42.3.375)
 10. Carratalá RM, Cabezuolo MEC, Herrera IH, et al.: Nontraumatic lesions of the scalp: practical approach to imaging diagnosis: neurologic/head and neck imaging. *Radiographics*. 2017, 37:999-1000. [10.1148/rg.2017160112](https://doi.org/10.1148/rg.2017160112)
 11. Raposo AC, Correia A, Vaz J, Alves L, Morais P: Firm nodule in the scalp. *Aust J Gen Pract*. 2019, 48:294-7. [10.31128/AJGP-10-18-4721](https://doi.org/10.31128/AJGP-10-18-4721)
 12. Kovacic M, Rudic M, Nekić I, Lisica-Sikić N, Kranjčec Z, Simurina T: Giant pilomatrixoma (benign calcifying epithelioma of Malherbe) of the neck and face. *Dermatol Surg*. 2007, 33:340-3. [10.1111/j.1524-4725.2007.33070.x](https://doi.org/10.1111/j.1524-4725.2007.33070.x)
 13. Türk CÇ, Bacanlı A, Kara NN: Incidence and clinical significance of lesions presenting as a scalp mass in adult patients. *Acta Neurochir (Wien)*. 2015, 157:217-23. [10.1007/s00701-014-2266-7](https://doi.org/10.1007/s00701-014-2266-7)
 14. Panchmatia JR, Arvin B, Thomas DG: Meningioma--an unusual cause of a forehead lump. *Acta Neurochir (Wien)*. 2008, 150:925-6. [10.1007/s00701-008-0003-9](https://doi.org/10.1007/s00701-008-0003-9)
 15. Applebaum MA, Barnes C, Harrington M: What is it? A rare presentation of a meningioma. *Eplasty*. 2016, 16:e40.
 16. Hoye SJ, Hoar CS Jr, Murray JE: Extracranial meningioma presenting as a tumor of the neck. *Am J Surg*. 1960, 100:486-489. [10.1016/0002-9610\(60\)90394-9](https://doi.org/10.1016/0002-9610(60)90394-9)
 17. Rushing EJ, Bouffard JP, McCall S, Olsen C, Mena H, Sandberg GD, Thompson LD: Primary extracranial meningiomas: an analysis of 146 cases. *Head Neck Pathol*. 2009, 3:116-30. [10.1007/s12105-009-0118-1](https://doi.org/10.1007/s12105-009-0118-1)
 18. Janakiram TN, Parekh P, Subramaniam V: Primary extracranial meningioma: the royal pearl experience. *Indian J Otolaryngol Head Neck Surg*. 2015, 67:120-3. [10.1007/s12070-015-0856-1](https://doi.org/10.1007/s12070-015-0856-1)