Case Series: Calcified Pseudoneoplasms of the Neuroaxis (CAPNON)

Ee Shern Liang MB ChB; Geoffrey A Tipper; Zakier Hussain MBBS, FRCS (SN), FRACS (Neuro); Yee Chiung Peter Gan MBChB (Glasgow), AFRCS (Edinburgh), FRCS (Neurosurgery), CCST (UK)
Waikato Hospital, Hamilton, New Zealand

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Introduction

This is a case series looking at the clinical presentation, imaging and pathology of patients with calcified pseudoneoplasms of the neuroaxis (CAPNON)

Calcified Pseudotumours of the Central Nervous System are sometimes colloquially termed "brain stones". These lesions are non-neoplastic and can arise intra- or extra-axially.

This pathological entity should be considered as part of the differential diagnosis when dealing with heavily-calcified lesions within the neuraxis.

Methods

Analysis of pathology database for cases of CAPNON was done for the years 2013 to 2014. Patient data collected include age, gender and race. Clinical details recorded include presenting history, radiology findings, intraoperative findings and histology.

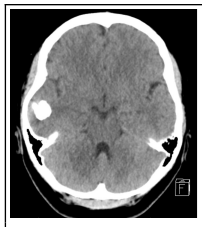
Results

Four cases were found. All four patients were females of Maori descent with an age range of 23 to 52 years. Three patients had generalised tonic -clonic seizures whilst one other patient presented with ataxia and headaches. A heavily calcified mass was seen upon imaging of the head.

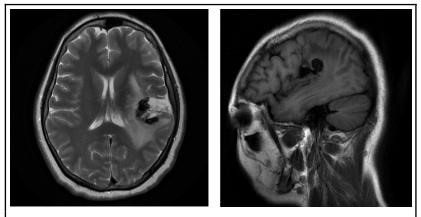
Complete excision of the heavily calcified lesion was achieved in all cases. Some could be excised en masse whilst others need to be broken into smaller particles.

Histologically the lesions show densely calcified nodules, radially arranged spindle cells and epithelioid cells, central areas of metaplastic bone formation and fibrovascular stroma.

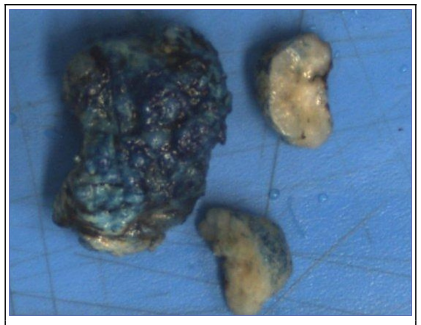
No recurrence was seen in all cases during follow up at the 3 and 12 month mark. Three patients made a full recovery with resolution of pre-operative symptoms. One patient developed permanent hemiparesis post-op.



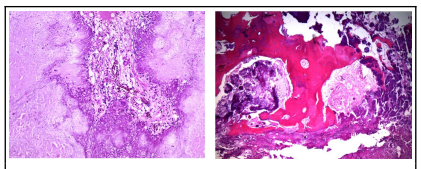
Axial CT showed a hyperattenuating lesion in right inferolateral temporal lobe. This corresponded to a hypointense lesion on axial T1-weighted (post gadolinium) MRI.



Axial T2-weighted MRI demonstrated a hypointense lobular lesion with surrounding vasogenic oedema. Sagittal T1-weighted MRI of the same patient showed a hypointense lesion.



Macroscopic appearance of excised lesion showing a rubbery external surface and rock-hard core



H&E biopsy specimens demonstrating coalescent, densely calcified nodules featuring a peripheral rim of radially arranged spindle and few epithelioid cells. The central areas showed metaplastic bone formation and a fibrovascular stroma.

Conclusions

CAPNONs are rare tumours of the central nervous system that may mimic low grade tumours radiologically. Literature review yielded 46 previously reported cases. Seizure was the commonest symptom (37%) and the temporal lobe was the commonest location (17%). Histologically these lesions may appear similar to WHO Grade I pilocytic astrocytomas. Given the benign nature of these tumours the decision for surgical excision should be considered carefully given the risks involved.

Learning Objectives

CAPNONs are very difficult to diagnose radiologically. Biopsies may be equally challenging given the heavy calcification often seen in these tumours. Prudent observation may be a superior alternative to early surgical intervention.