

Gangliocytoma – Magnetic Resonance Imaging Characteristics

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ABSTRACT

An atypical presentation of a temporal lobe gangliocytoma in an adult female with headaches is reported. Computed tomography showed a hypodense enhancing mass in the right temporal lobe with vasogenic oedema and mass effect. MRI demonstrated a well demarcated mass of low signal on T1W, intermediate signal on PDW, high signal on T2W and homogeneous enhancement on post-gadolinium scan. This case is an addition to the current literature for the characteristic MR features of a ganglion cell tumour.

Keywords: gangliocytoma, magnetic resonance imaging, computed tomography

INTRODUCTION

Gangliocytoma and ganglioglioma are extremely rare benign neuronal tumours which show varying degrees of neoplastic evolution in the glial component⁽¹⁾. The presence of mature gangliocytes with scanty glial stroma distinguishes gangliocytoma from ganglioglioma⁽²⁾. Both share common characteristics in terms of incidence, site, macroscopy and biological behaviour⁽¹⁾. This case is discussed with a literature review to highlight the unusual clinical history and characteristic MR findings.

CASE REPORT

A 41-year-old female craft worker and riding instructor presented with a 6-week history of progressive symptoms of raised intracranial pressure such as headaches, lethargy, drowsiness and unsteadiness of the gait. There were no visual symptoms, speech problems or epileptic seizures. She was left handed with no neurological abnormalities in the upper or lower limbs. The cranial nerves were intact apart from mild bilateral papilloedema.

Pre-contrast CT scan revealed a low attenuation mass in the right temporo-parietal region causing compression and displacement of the right lateral ventricle and basal cisterns along with associated oedema. No calcification was demonstrated (Fig 1a). Post-contrast CT scan showed an oedematous mass (Fig 1b).

She underwent a right temporal craniotomy for the tumour excision. A greyish necrotic mass was found deep within the superior temporal gyrus. Radical right temporal lobectomy was performed.

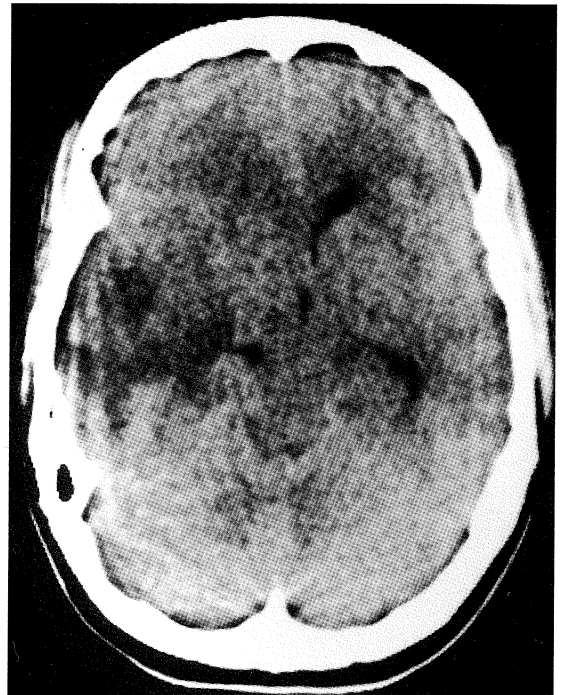


Fig 1a

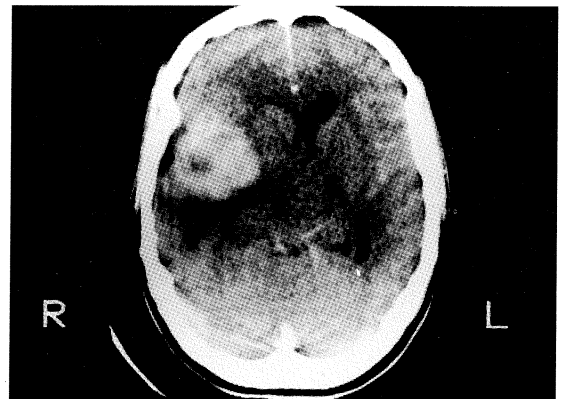


Fig 1b

Fig 1a & 1b – Pre-contrast CT scan shows a low attenuation mass lesion in the right temporal lobe causing effacement of the right lateral ventricle, mass effect and midline shift along with surrounding vasogenic oedema. CT scan following IV contrast diffuse enhancement of the mass lesion.

Histopathology showed a tumour composed of mature ganglion cells with many binucleate and occasional multinucleate forms. No obvious neoplastic astrocytes were seen but scattered islands of round cells with perinuclear halos were noted. Mitotic figures were absent. The appearances were consistent with a gangliocytoma without a glial component.

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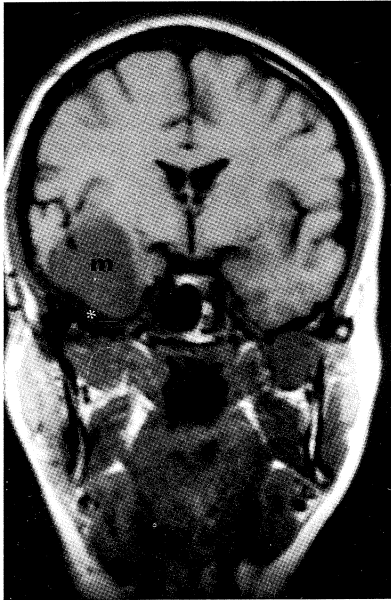


Fig 2a – T1W coronal scan shows a low signal well defined mass lesion in the right temporal lobe (m). Widened CSF space is noted infero-lateral to the mass (*).

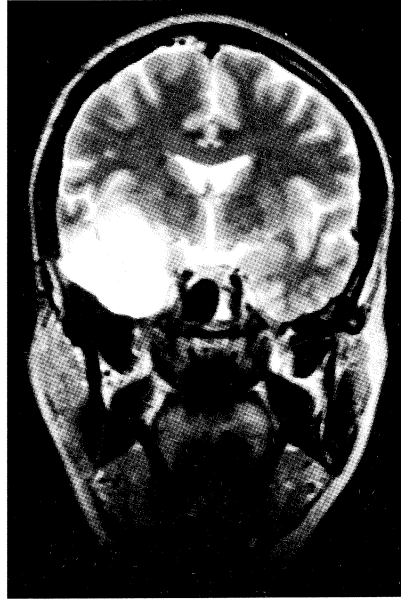


Fig 2b – T2W coronal scan demonstrates a high signal in the right temporal lobe.



Fig 2c – Coronal T1W post gadolinium scan shows a homogeneously enhancing well defined mass lesion in the right temporal lobe.

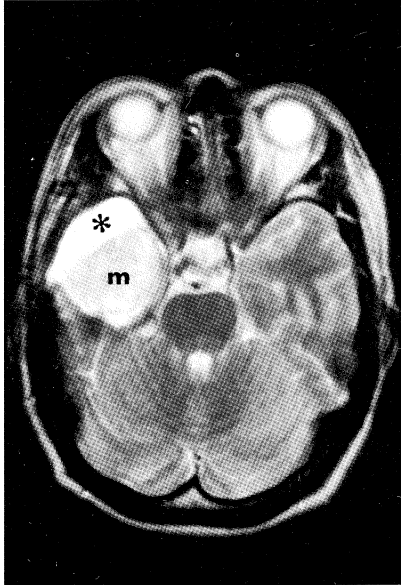


Fig 2d – T2W axial scan shows a well demarcated right temporal lobe mass lesion (m) with a dilated CSF space anterolaterally (*).

Four months later, she had an MR scan for further assessment. Axial T2-weighted and proton density along with coronal T1-weighted and T2-weighted images pre- and post-Gadolinium DTPA were obtained on a 0.5 Tesla GE scanner. MR scan showed a well circumscribed mass in the right temporal lobe extending to the ipsilateral external capsule and insular region. The mass was of low signal on T1W (Fig 2a), intermediate on PD and of high signal on T2W (Fig 2b). It showed homogeneous enhancement on post-contrast scan (Fig 2c). A widened CSF space was noted anterolateral to the right temporal lobe presumably due to a previous surgery (Fig 2d). The patient had remained completely asymptomatic in the post

operative period without any neurological deficit. Considering the relatively benign nature of the tumour, both clinically and radiologically, a further surgery was contemplated to achieve a complete macroscopic excision. Histopathology once again confirmed a gangliocytoma. However, there were areas of less differentiated tumour with mitotic activity and a glial component. Post-operative recovery was uneventful. No adjuvant therapy was recommended at this stage and she was discharged to be re-examined 3 months post-operatively.

DISCUSSION

Gangliocytoma is an extremely rare, benign intraparenchymal neuronal tumour, comprised of mature ganglion cells with relatively scanty stromal glial cells and little or no evidence of mitosis. This neoplasm occurs most frequently in children and young adults usually under the age of 30 years. There is often a characteristic history of epileptic seizures, sometimes with mental retardation⁽¹⁾. The most frequent site is the temporal lobe but they can arise anywhere in the central nervous system like in the cerebellum, brainstem, floor of the third ventricle and spinal cord, etc⁽³⁾. This patient never suffered any epileptic fits, her chief complaint was increasing headaches of 6 weeks duration, although she was discovered to have a temporal lobe lesion. In the literature, diverse CT and MR appearances of gangliocytoma have been described⁽³⁻⁵⁾. The CT findings ranged from hypo- to hyperdense, cystic to solid, enhancing or non-enhancing lesions with or without oedema or mass effect^(6,7). Calcification has been reported on CT in up to 35% cases^(8,9). In this case, CT demonstrated a hypodense enhancing lesion without calcification, causing mass effect and surrounded by oedema.

Various diagnostic features have been documented in the literature^(2,4,6,9,10) with the use of MRI. In this case, MRI revealed a well defined lesion present in the right temporal lobe, which gave a low signal on T1W, intermediate signal on proton density and high signal on T2W sequences. The tumour showed homogeneous enhancement on post-Gadolinium scan. These MR findings correlate well with the recently published reports^(2,6,10). The differential diagnosis on imaging includes astrocytomas, oligodendrogliomas, porencephalic cavities and arachnoid cysts. Ganglion cell tumours are usually radio resistant, therefore surgical removal is the only option with a favourable prognosis.

In conclusion, although this case did not present with a typical history and CT was non-specific, but MR findings were highly suggestive of a benign ganglion cell tumour. Although the definite diagnosis of a gangliocytoma is only possible at histopathology, neuroimaging, particularly MR has a well established role in reaching towards the correct diagnosis in young patients with a temporal lobe or cerebellar lesion with or without epilepsy.

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SMA ETHICS & PRACTICE CONVENTION 1998 & SMA LECTURE 1998

Saturday, 14 November 1998, 2.00 pm to 5.30 pm
Alumni Auditorium, Level 2, Alumni Association

Sunday, 15 November 1998, 9.00 am to 5.30 pm
Alumni Auditorium & COMB Auditorium

SEMINAR ON CLINIC DISPENSING

Saturday 14 November 1998
Alumni Auditorium Level 2 Alumni Association
2 College Road
Chairman : Dr Lim Teck Beng

- 2.00pm Opening Address
2.05pm Laws & Regulations on Medicine in Singapore
by Mr R Sivalingam, Head, Inspector,
Pharmaceutical Department, MOH
2.25pm Challenges in Clinic Dispensing
by Dr Lee Pheng Soon
2.45pm State Certified Healthcare Assistants as Dispensers
by Dr Chong Yeh Woei
3.05pm Use of Computers in Clinic Dispensing
by Dr Lim Poh Heng
3.25pm Q&A
3.30pm Tea Break

4.00pm to 5.00pm 2 concurrent sessions

- I. Rational Pricing of Medicine in Clinic Dispensing
(For Doctors Only)
- II. Implementing Good Dispensing Practices for Healthcare
Assistants (For Clinic Assistants & Doctors)

MINI-COURSE ON MEDICAL ETHICS

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Alumni Auditorium Level 2 Alumni Association
2 College Road
Co-organised by NUS Bioethics Group
9.00am to 12.30pm

Course outline : Definitions of Ethics/Glossary/Brief History
of Medical Ethics/Ethical Responsibilities of Doctors/Case
Studies

SEMINAR ON "MEDICAL PROFESSION & THE MEDIA"

Sunday 15 November 1998
COMB Auditorium
16 College Road
3.30pm to 5.30pm

- 3.30pm Overview by Dr T Thirumoorthy
3.40pm Representative from the public
4.00pm Representative from the press :
Leslie Fong, Editor, Straits Times/Sunday Times
4.20pm Representative from the medical profession :
Dr Lim Meng Kim, Medical Practitioner
4.40pm Panel Discussion :
Above speakers, A/Prof Goh Lee Gan,
Dr David Chan, Philosophy Department, NUS

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