Young adults with intracranial germ cell tumours presenting as an emergency: a retrospective study

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Background

• Intracranial germ cell tumours (ICGCTs) are rare and develop in children or young adults.1
• They frequently arise within the pineal or suprasellar regions. However, this compromising anatomical origin poses a diagnostic challenge, which can affect treatment, prognosis and overall survival.2
• A multimodality treatment approach can achieve long-term responses.2,3
• There is a lack of consensus on optimum management of these young patients
  • Treatment modalities
  • Diagnostic work up

Methods

• Retrospective analysis from a single specialist Centre, 23 patients identified in total.
• Inclusion criteria: primary diagnosis of ICGCT.
• Data collected from electronic records: patient demographics, symptoms at presentation, histology, treatment modalities, treatment duration, outcome and mortality.

Results

• 22 male patients:
• Median age 24.5 years (range 17-50 years) at presentation.
• Disease was invariably confined to the pineal gland, with histological findings when available summarised in Fig. 2.
• 86.4% presented with symptomatic disease (Fig. 1), 21.4% with hormone dysfunction.
• 68.2% required emergency treatment for a new cancer diagnosis with either neurosurgery, chemotherapy or radiotherapy.
• 95.8% received the EP-OMB chemotherapy regimen with or without intrathecal Methotrexate.
• Median HCG at presentation 11 iU/L (range 2-157); median AFP 3 mcg/L (range 2-657). Tumour markers were frequently elevated at diagnosis within the cerebrospinal fluid (CSF) but not the serum.
• For the 31.8% whose disease had progressed despite treatment, 68.2% remain alive at follow-up with a median survival 5.6 yrs (range 1.2-14.8).
• One female patient: Presented June 2019 at age 29 with progressive visual loss and pituitary failure including cranial diabetes insipidus. Serum tumour markers were normal but CSF HCG was raised. Emergency Etoposide-Cisplatin (Em-EP) then EP-OMB and intrathecal Methotrexate fully restored her vision. Consolidation radiotherapy followed. The endocrinopathies have now fully resolved and she remains well.

Conclusions

• Our findings demonstrate that young adults presenting with ICGCTs frequently require emergency treatment for a new cancer diagnosis.
• CSF rather than serum tumour marker analysis is an important part of diagnostic work-up.
• Consensus on optimal management is warranted given the emergency therapeutic interventions that are available and potential for unacceptable treatment toxicity from a multimodal approach.

Fig. 1 Illustration of the range of presenting symptoms in this population of young men

Fig. 2 In our dataset, 68.2% patients had a biopsy to confirm the histological diagnosis

References


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Fig. 3A Initial MRI at presentation with an abnormal midbrain lesion.
Fig. 3B Interval volume increase in the midbrain lesion with greater abnormal signal extending into the right midbrain and superiorly into the posterior limb of the internal capsule. There is associated greater mass effect with distortion of the aqueduct and superior aspect of the fourth ventricle. No additional intracranial lesions identified.
Fig. 3C Significant radiological reduction in size of the midbrain lesion following treatment.
• The diagnosis was revisited. FDG PET-CT did not demonstrate any evidence of extra-cranial disease. US tests and serum tumour markers were normal.
• A stereotactic biopsy was performed, which confirmed a germ cell tumour with an intense granulomatous reaction (Fig. 4 A and D).
• Urgent admission for rapid work-up and chemotherapy with EP-OMB and intrathecal Methotrexate.
• Consolidation radiotherapy to the midbrain and ventricles followed.
• A significant tumour reduction is evident radiologically (Fig. 3C) with clinical stability prompting neurorehabilitation.

Fig. 4A H&E section showing CNS parenchyma with florid inflammation with well circumscribed granulomas made up of macrophages and lymphocytes. There are also some atypical cells seen at higher magnification on Fig 4D which suggest a neoplastic process
Fig. 4B Diffuse inflammation following staining with CD68 macrophage marker.
Fig. 4C, 4D and 4E. Three germ cell immunohistochemical markers with positive staining.