An unusual infective cause for recurrent seizure

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Introduction

• Causes of seizure
  – genetic problem
  – cerebrovascular disease
  – tumours of brain and its coverings
  – trauma to head
  – infection of brain and its coverings
    • pyogenic cerebral abscess
    • tuberculosis
    • cysticercosis
    • toxoplasmosis
Case History

• 29 years old male
• seizure and headache x 4 year duration
• MRI done (another hospital 4 yrs ago)
• multiple conglomerate ring enhancing lesions
• invasion of left frontal lobe
• focal dural thickening.
Management (Previous hospital)

Based on the radiological features

• anti-tuberculous treatment
• anti-neurocysticercosis treatment
• three anti-epileptic drugs

Clinical course

• patient continued to have seizure on and off
• when the frequency of seizure and headache increased, he presented to the present hospital.
Present Hospital

• General examination
  – unremarkable
  – no neurological deficit
  – signs of ↑ ICT +

• Local examination (cranial vault)
  – a firm 4x4 cm swelling
  – not tender
  – fixed to underlying bone without skin involvement
(H/O hit by a sharp object over the scalp, when he was 12 years old)
Investigations

• Routine laboratory examinations – normal
• Workup for immunocompromised state – negative
• CT thorax and CT abdomen – normal
• Blood culture – no growth

• Computed tomography (CT) brain with contrast.
CT brain

- large erosive lesion of frontal and parietal bones
- extensive dural and pericranial infiltration
- infiltration in the left parasagittal region
- significant perilesional oedema.
Present Management

- frontal and parietal craniectomy
- excision of intracranial part except the area involving the superior sagittal sinus
- sent for pathological examination.
Pathological Examination
AFB -
GMS +

Splendore-Hoepli material

Colony of filamentous bacteria
Pathological Diagnosis

Craniocerebral actinomycosis
Post surgical follow up

- After 3 days, CT brain – no residual lesion except the infiltration in the sinus
- 14 days – IV ceftriaxone (allergic to penicillin)
- 6 months – oral clindamycin
- After 6 months, MRI brain – no lesions
- No seizure; single antiepileptic drug (phenytoin 300mg/day)
- 5 years follow up – No clinicoradiological recurrence.
Review of Literature
Primary CNS involvement

- very rare; first case was reported in 1882
- Predisposing factors
  - dental problems, head trauma, chronic mastoiditis, cardiac septal defect & IUCD
- Common lesions
  - brain abscess (67%); meningoencephalitis (13%); epidural empyema (6 %)
- Rare lesion
  - craniocerebral actinomycosis involving bone, dura and brain parenchyma
  - our case is the 5th in the literature.
# Reported cases of craniocerebral actinomycosis

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Age/sex</th>
<th>Presentation</th>
<th>Location of bone involvement</th>
<th>Structures involved</th>
<th>Management</th>
<th>Outcome</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khosla V K et al 1984</td>
<td>71/m</td>
<td>Confusion, recurrent GTCS</td>
<td>R frontal</td>
<td>Bone, dura, falx and brain parenchyma</td>
<td>Surgical excision and penicillin</td>
<td>Good</td>
<td>3 months</td>
</tr>
<tr>
<td>Soto-Hernandez et al 1999</td>
<td>NR</td>
<td>NR</td>
<td>Parietal</td>
<td>Bone, dura, falx and subdural space</td>
<td>Surgical excision and antibiotic</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Narayanan SK et al 2009</td>
<td>13/m</td>
<td>Fever, proptosis, Seizure, forehead ulcer</td>
<td>R frontal</td>
<td>Bone, epidural space</td>
<td>Ulcer biopsy, penicillin</td>
<td>Good</td>
<td>6 months</td>
</tr>
<tr>
<td>Budenz et al 2010</td>
<td>12/f</td>
<td>Altered mental status</td>
<td>R petrous apex</td>
<td>Bone, cochlea and meninges</td>
<td>Subtotal petrosectomy, antibiotics</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Present case</td>
<td>29/M</td>
<td>Recurrent seizures, headache</td>
<td>L frontal</td>
<td>Bone, dura, falx, brain parenchyma</td>
<td>Surgery, Ceftriazone and clindamycin</td>
<td>Good</td>
<td>60 months</td>
</tr>
</tbody>
</table>
Definitive diagnosis

• isolation of an actinomyces species in culture
  – low sensitivity (30%)
• macroscopic detection of sulfur granules
• microscopic identification of filamentous organisms with surrounding eosinophilic Splendore-Hoepli material
  – gram-positive, non-acid-fast and anaerobic or microaerophilic
• DD: Nocardiosis
  – gram-positive, acid-fast and aerobic
Summary

• Primary craniocerebral actinomycosis
  – extremely rare cause for seizure
  – kept in mind when encountering granulomatous lesion not responding to usual treatment
  – could be due to direct inoculation in our case
  – surgical excision is first choice of treatment
  – HPE plays important role in making a correct diagnosis and guiding the management.
References


Thank you