Multiple Brain Abscesses Caused by Streptococcus Intermedius: Prognostic Index of Mortality

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Abstract
The aim of this paper is to show the correlation between the imaging features of brain abscess in a patient with multiple brain abscesses and the possible outcome of the disease by using a point-grading system. For this purpose we will review a real clinical case, admitted and investigated in our clinic, we will describe the radiological features from the imaging studies done (contrast enhanced CT and MRI) and with the use of a grading scale according to those features a sum of points will be gathered, which refers to an anticipated outcome for the patient. We will examine the value of the score, deriving from the point sum, as a prognostic index of mortality based on the score that this patient had and his actual clinical outcome and whether this outcome was indeed anticipated. In addition there is an epidemiological value of this case report as the brain abscesses were cryptogenic regarding etiology and the causative agent was Streptococcus intermedius.

Introduction
Brain abscess, whether single or multiple, represents a serious diagnostic and curative problem. Computer Tomography (CT) and Magnetic Resonance Imaging (MRI) are the essential studies for diagnosis as well as monitoring of the disease, which also seems to have a prognostic value for its evolution.

Purpose
To present a patient clinical case with multiple brain abscesses, presented with progressively worsening gait instability, which started a week before admission, fever and acute declination of level of consciousness.

Case Report
83 year-old male patient with history of prostatectomy 8 years ago due to prostate cancer, STEMI that occurred 15 years ago and arterial hypertension brought at the ER by his family members due to progressively worsening gait instability, which started a week before admission, fever and acute declination of level of consciousness, that according to his daughter started 12 hours ago. From the clinical examination the patient presented with a left hemiparesis of upper and lower extremity with reduced light touch sensitivity and a positive left Babinski sign. His GCS was 13/15. No other possible cause or source of fever was able to be identified through the remaining clinical examination of the patient (Table 1).

CT enhanced (Figure 1, right images) with iv contrast study showed multiple oedematous areas bilaterally, with increased peripheral density (ring-enhanced lesions) and mild perileisional edema, while their morphology features in additional testing with Gadolinium-enhanced MRI (Figure 1, left images, T1-weighted) raised the suspicion for multiple brain abscesses in both brain hemispheres, mostly in the right one.

The patient was initiated on empirical antimicrobial therapy with ceftriaxone, vancomycin and metronidazole in full dosing regimes [1-3]. Neurosurgical consultation for stereotactic biopsy of the lesions was asked, which was successful and the result of the pus culture showed growth of Streptococcus intermedius (Streptococcus milleri group).

A full clinical laboratory and imaging investigation was initiated in order to track the primary focus of the infectious process, which presented with brain dissemination as the cause of this patient's admission, but it was not possible to identify one (20%-30% of brain abscess cases are cryptogenic) [4-6] (Table 2).

Discussion
A brain abscess is a focal, intracerebral infection that starts as an isolated area of encephalitis and evolves into a collection of pus surrounded by a well-vascularized capsule [4,7]. A method of classification of abscesses is based on the source of origin and the "primary gate" of infiltration of the infection and are categorized in:

- Spreading of the infection from nearby structures (per continuitatem)–the most common cause.
- Hematogenic dissemination.

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Table 1: Diagnostic tests and clinical course.

<table>
<thead>
<tr>
<th>WBC</th>
<th>K</th>
<th>SGOT</th>
<th>INR</th>
<th>aPPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.70 K/μL</td>
<td>3.8 meq/L</td>
<td>17 U/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>92.8%</td>
<td>134 meq/L</td>
<td>22 U/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LYMPTH 3.5%</td>
<td>54 U/L</td>
<td>21 U/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48%</td>
<td>1.08 mg/dL</td>
<td>y-GT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.2 gr/dL</td>
<td>13 U/L</td>
<td>ALP 44 U/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>302 K/IU</td>
<td>190 mg/dL</td>
<td>LDH 224 U/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9</td>
<td>45 mg/dL</td>
<td>CRP 198 mg/L</td>
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</tbody>
</table>
| 31.5 sec | 0.8 mg/dL | Serum Creatin

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The diagnosis is based on brain CT and MRI imaging studies, which are essential for monitoring the clinical course of the disease and its response to treatment, but also represent an indirect index for determination of prognosis and mortality by using an imaging-based score of severity of the disease [13-20] (it is considered more trustworthy index than GCS) including the following parameters: (Table 3)

### Conclusion

According to the classification mentioned above this patient’s score was >10 points (in specific 12 points→>5+3+2+1+1). The patient has been hospitalized for a prolonged interval and has been receiving his antimicrobial regime. Despite the successful management of complications such as respiratory failure and seizures the patient eventually deceased without any improvement of the infectious process.

### References