Basilar Artery Occlusion

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Conflict of interest

None

Outline

Incidence and etiology
Clinical presentation
Evaluation
Complications
Treatment and prognosis
Clinical Case

HPI: The patient is an 81-year-old right-handed man with history of HTN and Atrial Fibrillation on Dabigatran. He was in his usual state of health until about 4 days prior to admission. At that time, he felt generalized malaise and weakness. Additionally, the patient reported that he was unable to see the right side of people’s faces. This apparently fluctuated and improved over the period of the day.

BP 206/98
Alert but only oriented to person
Memory difficulties
Right lower quadrantanopsia
Decrease tone but 5/5 strength

Full dose anticoagulation was continued and the patient was discharge to a rehabilitation facility.

Six days later the patient was brought to the ED. The family reports that the patient has lost his speech, has not been eating and is sleeping all the time. Upon arrival to the ED pt GCS was 7, Rt sided HMP and he was intubated for airway protection.
Incidence

Posterior circulation strokes account for about 20% of all ischemic strokes.

Basilar Artery Occlusion (BAO) occurs in 14% of patients with post circulation stroke.

Rate of death or severe disability is 80-90%.

Etiology

Embolic affects the distal Basilar Artery.

Atherothrombotic occlusions affect the proximal and mid-basilar segments.

Differential Diagnosis

- Posterior reversible encephalopathy syndrome (PRES)
- Dural sinus thrombosis
- Hypoxic-Ischemic encephalopathy
- Meningitis/encephalitis
- Neuromuscular disorders with CN involvement
- Metabolic/Medicines
- Seizures
- Basilar Migraine
- Circulatory shock
### BAO vs. PRES

<table>
<thead>
<tr>
<th>Presentation</th>
<th>BAO</th>
<th>PRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe HTN</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Visual abnormalities</td>
<td>Common</td>
<td>Common</td>
</tr>
<tr>
<td>Altered Consciousness</td>
<td>Common</td>
<td>Common</td>
</tr>
<tr>
<td>Seizures</td>
<td>Uncommon</td>
<td>Common</td>
</tr>
<tr>
<td>Motor weakness</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Prodromal symptoms</td>
<td>Common (up to 60%)</td>
<td>Rare</td>
</tr>
<tr>
<td>Head CT findings</td>
<td>Normal or hypo densities both gray and white matter</td>
<td>Can be normal if hypodensity is restricted to the white matter</td>
</tr>
<tr>
<td>Management of HTN</td>
<td>Do not treat!</td>
<td>Lower BP</td>
</tr>
</tbody>
</table>

### Clinical Presentation

Prodromal symptoms are very common

Occur within 2 weeks prior to admission

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertigo, nausea</td>
<td>26</td>
</tr>
<tr>
<td>Headache, neckache</td>
<td>18</td>
</tr>
<tr>
<td>Hemiparesis</td>
<td>9</td>
</tr>
<tr>
<td>Double vision</td>
<td>9</td>
</tr>
<tr>
<td>Dysarthria</td>
<td>9</td>
</tr>
<tr>
<td>Hemianopia</td>
<td>5</td>
</tr>
<tr>
<td>Hemihypesthesia</td>
<td>5</td>
</tr>
<tr>
<td>Tinnitus, hearing loss</td>
<td>5</td>
</tr>
<tr>
<td>Drop attack</td>
<td>4</td>
</tr>
<tr>
<td>Confusion</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
</tbody>
</table>


### Clinical Presentation: A few pearls

Isolated symptoms are uncommon

Risk factors

Isolated episodes of vertigo are much more likely to be due to peripheral vestibular disorders

“lightheadedness” very rare (7% of 407 pts)
Clinical Presentation: A few pearls

An isolated transient LOC is likely to be due to seizures or syncope

“cerebellar fits” have been observed in patients with BAO

Pay special attention to patients with AMS + any clinical sign of brainstem ischemia + negative Head CT

Vertigo and Nausea were common
Headache and neck pain

65% had AMS (Somnolence ----> Coma)
78% had long tract signs


Diagnosis

A negative head CT should only reinforce the idea that BAO is possible

CT angiography is the best test in an emergency situation (sensitivity / specificity > 90%)

Evaluation

Can the patient protect the airway?

GCS scale < 8

GCS > 8 but airway protective reflexes might be depressed (gag, cough)

Complications

Progression of ischemia

Brainstem Compression

Clinical Deterioration

Hydrocephalus

Hemorrhagic Transformation

Treatment: Supportive Measures

<table>
<thead>
<tr>
<th>Table 1: Management Recommendations for Supportive Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Management</strong></td>
</tr>
<tr>
<td>Anticoagulation</td>
</tr>
<tr>
<td>Fluids</td>
</tr>
<tr>
<td>Hypertension control</td>
</tr>
<tr>
<td>Blood pressure</td>
</tr>
<tr>
<td>Oxygenation management</td>
</tr>
<tr>
<td>Sedation</td>
</tr>
<tr>
<td>Follow-up</td>
</tr>
<tr>
<td>Pharmacotherapy</td>
</tr>
<tr>
<td>Anticoagulation</td>
</tr>
<tr>
<td>Cardiac monitoring</td>
</tr>
</tbody>
</table>

Baird TA et al. Basilar Artery Occlusion. Neurocrit Care 2004;1 (3) : 319-29
Treatment and outcomes of acute basilar artery occlusion in the Basilar Artery International Cooperation Study (BASICS): a prospective registry study

Treatment: Recanalization

Prognosis: BASICS

Age > 60
High NIHSS score (> 20)
Prodromal minor stroke
Longer time to treatment
No hyperlipidemia

Clinical and Procedural Predictors of Outcome From the Endovascular Treatment of Posterior Circulation Strokes

Multicenter retrospective analysis of consecutives pts with posterior circulation strokes who underwent stent retriever or aspiration thrombectomy

- 100 patients
- Recanalization rate 80%
- Symptomatic ICH 5%
- Mortality was 30%
Outcome

Favorable outcome (mRS <2 at 3 months) was 35%  
Better outcome if done within 6 hour window

Figure. Clinical outcomes of patients according to the modified Rankin Scale (mRS) at 3-month follow up (mRS, 0-2: good outcome, mRS, 3-5: moderate outcome, mRS, 6: poor outcome). *Adjusted for age, sex, and stroke etiology. 

Source. Stroke 2016;47:782-788

Prognosis

Atherothrombotic better than embolic etiology  
Failure to recanalize the vessel associated with a very high mortality rate  
The need of intubation and ventilatory support indicated a mortality rate of 88%  
Coma or quadriparesis at presentation


Conclusions

• BAO is difficult diagnosis and requires a high level of suspicion  
• If untreated the risk of severe disability and mortality is 80-90%  
• Common clinical presentation includes: AMS + signs of brainstem ischemia + negative Head CT  
• CT angiography of the brain is a very specific and sensitive way to confirm BAO  
• Vessel recanalization using thrombolytics/ clot retrieval devices seem to improve outcomes but prospective randomized studies are need it
Thank You