INTRODUCTION
Basilar invagination (BI) is a developmental anomaly of the occipital bone and upper cervical spine defined when the tip of the odontoid process was at least 2.5 mm above Chamberlain’s line, resulting in an abnormally high vertebral column prolapsed into the skull base.1 Of note, BI is a radiographic finding and not a diagnosis, once it’s associated with many developmental anomalies.2 Protrusion of the odontoid is often associated with a horizontal clivus and craniocervical kyphosis.3 These conditions can result in ventral compression at the odontoid is often associated with a horizontal clivus and craniocervical malformation with tonsilar herniation, and the treatment is based on the odontoid process distancing itself from the anterior arch of the atlas or the lower end of the clivus. The patients might have Chiari malformation with tonsilar herniation, and the treatment is based on the reduction of C1-2 instability, once a real “lysthesia” can be found in some cases, with occipital traction or C1-2 distraction and fixation. Transoral decompression can be used in patients without reduction of the instability, if a fixed anterior compression is presented.5

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We presented an illustrative case to justify the hypothesis that some patients in Group B can be treated with craniocervical fusion to decrease craniocervical kyphosis and to avoid anterior brainstem stress due to instability. Consent was obtained from the patient presented in this paper.

Keywords: Platybasia; Decompressive craniectomy; Cranial fossa, posterior; Treatment outcome.

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Case Report

We present the case of a 60-year-old man who initially present to our clinic with complaints of cervical pain for the last 2. He stated that his condition had worsened in the past year with occurrence of progressive weakness in both arms and legs, with presence of paresthesias and numbness in both hands. Physical examination revealed bilateral hand and left arm paresis associated with loss of dexterity, which did not allow the patient to write. He was able to walk without assistance, with an objective motor deficit in the lower extremities. All the tendon reflexes were exacerbated. He did not present any sign of cranial nerve deficit. Of note, his symptoms intensity decrease when he holds his head in extension, worsening the pain and numbness when in flexion – a clear mechanical instability.

CT scanning and MR imaging showed the presence of a BI, with the tip of the odontoid process above the Chamberlain’s line but below the Wackenheim’s clival line and the McRae’s line. A clivus-canal angulation in flexion of 93° was measured.

This patient underwent an occipital-C2-3 fusion in extension, without posterior fossa decompression. Due to his extremely thin posterior occipital bone, we are not able to put screws, using a combination of plates and wires, as shown in Figure 1. We used C2 pars screws and C3 lateral mass screws.

Postoperatively, he reported important improvement for walking and the weakness in his superior extremities was considerably reduced. After one year of follow-up, the patient still improving, presenting only occasional paresthesias in both arms. He was able to return to work as a writer without limitations. The follow up CT scan showed an increase in the clivus-canal angle, from 93° to 127°.

Figure 1. (A) Preoperative CT scan (sagittal reconstruction) showing the patient clivus-canal angle of 93o; (B) A sagittal T2-weighted cervical MRI with a basilar invagination secondary to clivus hypoplasia and ventral brainstem compression; (C) Post-operative plain radiograph showing an occipito-C2-3 fixation; (D) A CT scan (sagittal reconstruction) showing the final clivus-canal angle of 127o decreasing the stress in the brainstem.

REFERENCES


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