

Treatment of Basilar Invagination

Objective: A treatment algorithm for basilar invagination on the basis of radiological features, intraoperative findings and analyses of long-term outcomes is presented.

Methods: 82 patients (mean age 40 ± 18 years; range 9 to 75 years) with basilar invagination were evaluated (mean follow-up of 57 ± 55 months). Radiological features, intraoperative and neurological findings were analyzed. Long-term outcomes were evaluated with Kaplan-Meier statistics. 77 patients with concomitant Chiari I malformation underwent foramen magnum decompression with duraplasty. Patients with ventral compression by the odontoid were managed by posterior realignment and C1/2 fusion. Patients without ventral compression underwent no C1/2 fusion unless radiological or clinical signs of instability were detected (Fig. 1).

Results: 33 patients underwent foramen magnum decompressions without additional fusion, while 52 operations for 49 patients involved posterior fusions C0-C2 or C1/2 after realigning a ventral compression and/or for C1/2 instability. Postoperatively, gait ataxia and suboccipital pain improved significantly in both treatment groups with 79% and 73% reporting their condition as improved after posterior decompression alone or posterior fusion with or without foramen magnum decompression, respectively. Progression-free survival rates for 10 years were achieved for 83% and 81%, respectively.

Conclusions: In basilar invagination, a subgroup of 40.2% characterized by absence of ventral compression, atlantoaxial dislocation or signs of craniocervical instability could be treated successfully long-term by posterior decompression without requiring fusion. The remainder underwent C1/2 fusion with or without posterior realignment. In basilar invagination, a concomitant Chiari I malformation should be treated with foramen magnum decompression and duraplasty as an additional pathology.

Figure 1

Treatment Algorithm for Basilar Invagination

