Limiting the Cranial Extent of Fusion to the Atlas does not Result Delayed Craniocervical Settling or Occipitocervical Instability After Surgical Decompression for Basilar Invagination

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Introduction

Occipitocervical fusion is commonly employed for the treatment of basilar invagination due to craniocervical junction instability and the destabilizing effects of adjunctive brainstem decompression surgery. This procedure has significant morbidity associated with loss of physiological function at the craniocervical junction. However, we hypothesized that many of the underlying pathologies causing basilar invagination were due to dysfunction of the atlantoaxial articulation. In those patients, our practice has been to limit the cranial extent of instrumented fusion to the atlas after direct ventral odontoidectomy or indirect decompression performed by atlantoaxial intraarticular graft placement.

Methods

A retrospective review of postoperative imaging and neurological status was performed for patients undergoing limited arthrodesis to the C1 vertebral body performed at our institution for treatment of symptomatic basilar invagination from 2013-2015.

Results

A total of 16 patients were treated for basilar invagination with atlantoaxial fusion after decompression, with a minimum of 1 year follow-up over the time period stated. No instances of delayed craniocervical settling or C1 lateral mass displacement was noted on 1 year radiographs for any of the patients. One patient developed self-limited symptomatic occipitocervical adjacent segment disease without neurological sequelae, treated successfully with conservative management. There was no instances of delayed neurological decline. There was one instance of immediate postoperative neurological decline that improved upon follow-up.

Conclusions

Limiting arthrodesis to the atlas can be safely performed without delayed adverse sequelae when performing decompressive surgery for basilar invagination.

Learning Objectives

By the conclusion of the session, participants should be able to 1) describe possible fusion options after basilar invagination decompression, 2) consider possible advantages of avoidance of occipitocervical fusion, 3) and identify acceptable treatment options for basilar invagingation

References