

Distraction, Compression, Extension and Reduction for Basilar Invagination and Atlanto-axial Dislocation: A Novel Pilot Technique In 65 Cases Sarat P Chandra MBBS MCh; Amandeep Kumar MBBS, MS, MCh; Avnish Chauhan MPhil

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Introduction

The study describes a new novel technique to reduce both BI and AAD through a single staged posterior approach only

Methods

65 patients with irreducible BI and AAD (May, 2010 - August, 2012), operated using this technique. Investigations included pre- and postoperative dynamic cervical x-rays, computed tomographic scans, 3dimensional reconstruction views and MRI. In all patients, reduction of the AAD and BI was achieved using a new innovative method of distraction, spacer placement, followed by compression and extension. A C1 lateral mass/C2 trans-laminar screw was performed where the C1 arch was not assimilated and occipito-C2 trans-laminar screw fixation was performed where the C1 arch was assimilated.



Results

61/65 (94%) patients improved clinically, 3 patients had stable symptoms (mean Nurick's post op score = 1.4; pre-op score = 3.7). AAD reduced completely in 63/65 patients and >50% in the other 2. One of these patients underwent a trans-oral procedure at a later stage. BI improved significantly in all patients. Solid bone fusion demonstrated in all patients with at least 6 months follow up (54). The duration of surgery ranged from 80-190 minutes, and blood loss was 90-500 mL (mean: 170+/- 35 ml). There was 1 death (myocardial infarction) and 1 morbidity (wound infection).

Conclusions

Spacer distraction coupled with extension as a treatment for BI and AAD seems to be an effective, simple, and safe method for the treatment of BI with AAD and may prove to be a better alternative than other existing methods.

References

Chandra PS, Kumar A, Chauhan A, Ansari A, Mishra NK, Sharma BS. Distraction, Compression and Extension Reduction Of Basilar Invagination and Atlanto-Axial Dislocation: A Novel Pilot Technique. Neurosurgery. 2013 Feb 19.



Schematic diagram showing the technique of reduction of BI and AAD using DCER. Note that the spacer acts like a pivot, following this compression applied dorsally leads to reduction of AAD



Improvement of cranio basal indices following DCER







Schematic diagram showing DCER being applied in a patient of BI and AAD with assimilation of C1 arch. Note that following spacer placement, BI is corrected but not AAD. Following this a compression is provided between the occiput and C2 laminae. This leads to extension of occiput over C2 leading to reduction of AAD over the spacer acting as pivot.

DCER in BI + AAD with syrinx, with complete resolution in 6



The advantage of combining C1 lateral mass screw with C2 trans laminar screw

