EXTENDED ENDOSCOPIC ENDONASAL APPROACH FOR C1-C2 TRAUMATIC AND INFLAMMATORY LESIONS

Iacoangeli M, Carrassi E, di Somma LGM, Marini A, Lisi SV, Della Costanza M, Dobran M

Department of Neurosurgery, Marche Polytechnic University, Umberto I General Hospital, Ancona, Italy
DISCLOSURES

All authors DO NOT have any financial or organizational relationships with commercial interests or other entities. They hereby certify that to the best of their knowledge, no aspect of their current personal or professional circumstances places them in the position of having a conflict of interest with their duties, responsibilities and exercise of independent judgement.
INTRODUCTION

• Extended Endoscopic Endonasal Approaches (EEA) are increasingly being used to address different types of anterior cranio-vertebral junction (aCVJ) diseases, including rheumatoid arthritis-related bulbo-medullary compression, basilar invagination in complex CVJ malformations and non-healed odontoid type II fractures

• We illustrate and discuss how EEA, possibly supplemented by a variety of anterior endoscopic C1–C2 screw fixation, may help in extending indications or in implementing the conventional techniques, by combined approaches, in aCVJ lesions which require surgical treatment
METHODS

We report a series of **46 patients** (from January 2009 to July 2018) affected by C1-C2 traumatic or inflammatory lesions treated with EEA alone or combined with conventional surgical approaches. Of these:

• **16** were treated with a combined classical anterior trans-cervical and endoscopic endonasal C1-C2 screw fixation approach for non-healed odontoid fractures;

• **7** underwent a fully endoscopic endonasal decompression and C1–C2 fusion for complex cranio-vertebral traumatic lesions;

• **23** undergoing EEA for irreducible bulbo-medullary junction compression due to a migrated odontoid process and/or retro-periodontoid inflammatory process.
RESULTS

✓ An improvement of at least one point in Ranawat or Nurick scales was observed in all cases.

✓ Radiologically adequate bulbo-medullary decompression was always achieved.

✓ Two patients developed delayed spine instability, requiring posterior occipito-cervical fixation.

✓ Bone fusion was always observed when anterior endoscopic C1–C2 screw fixation was used.
RESULTS: ILLUSTRATIVE CASE

- F, 82 yrs
- Reumatoid Arthritis
- Clinical onset with tetraparesis and drop attacks

Pre-operative MRI and CT scan with evidence of anterior irreducible compression (pannus retro-odontoiodeum)
RESULTS: ILLUSTRATIVE CASE (2)

Intraoperative images:
• After drilling the odontoid process at its apical part with ultrasonic bone scalpel, retro-odontoid compressive inflammatory pannus was carefully removed with Kerrison rongeur and curette
• Then, the preserved anterior C1 arch was fixed to C2 residual body by using two cannulated screws and following the K wires, under neuronavigation and fluoroscopy control
RESULTS: ILLUSTRATIVE CASE (3)

Post-operative CT scan after endoscopic endonasal odontoidectomy with anterior C1 arch preservation and C1-C2 screw fixation.

Odontoid tip removal provided the decompression on vertebral artery resolving drop attacks.
DISCUSSION

• The EEA, either alone or combined, may represent a potential alternative approach to conventional open transcervical, posterolateral, or transoral approaches classically used for aCVJ lesions.

• The possible advantages over the standard and transoral approaches include less invasiveness, reduced risk of infection by oral flora, wider and straightforward working angle and enhanced chances of preserving anterior C1 arch.

• The combined use of decompression and anterior endoscopic C1–C2 fixation/fusion reduce the risk of cranial settling and the need of posterior C1–C2 or occipito-cervical fusion for spine instability.
SUMMARY POINTS

- Extended Endoscopic Endonasal Approaches (EEA) are increasingly being used to address anterior cranio-vertebral junction diseases
- An improvement of different degree was observed in all cases
- Radiologically adequate bulbo-medullary decompression was always achieved
- The EEA may represent an alternative approach for potentially unstable aCVJ lesions when supplemented by anterior endoscopic screw fixation in order to avoid the need for an additional posterior approach
- Possible advantages include less invasiveness, wider, straightforward and adequate working angle