Endoscopic endonasal odontoid resection with real-time intraoperative image guided computed tomography

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Objective
We present 4 cases in which we used intraoperative computed tomography (CT) scanning to provide real-time image guidance during endonasal odontoid resection. While intraoperative CT has previously been used as a confirmatory test after surgical resection, this is the first time it has been used to provide real-time image guidance during endonasal odontoid resection. The operating room setup, as well as the advantages and pitfalls of this approach are discussed.

Methods
A mobile intraoperative CT was used in conjunction with real-time craniospinal neuronavigation in 4 patients who underwent endoscopic endonasal odontoidectomy for basilar invagination.

Results
All patients underwent a successful decompression. In 3 out of 4 patients, real-time intraoperative CT image guidance was instrumental in achieving a comprehensive decompression. In 3/4 (75%) cases where the right nostril was the predominant working channel, there was a tendency for asymmetric decompression towards the right side, meaning residual bone was seen on the left, which was subsequently removed prior to completion of the surgery.

Conclusion
Endoscopic endonasal odontoid resection with real-time intraoperative image guided CT is feasible, and provides accurate intraoperative localization of pathology thereby increasing the chance of complete odontoidectomy. For right handed surgeons operating predominantly through the right nostril, special attention should be paid to the contralateral side of the resection, where there is often a tendency for residual pathology.

Abstract

Operating Room Setup