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Odontoid process regeneration: an unexpected and previously unreported cause of transoral odontoidectomy failure

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Transoral odontoidectomy is a well described and largely used approach directed to decompress irreducible ventral brain stem compressions at the craniovertebral junction (CVJ). Intraoperative complications are CSF leakage, carotid or vertebral artery injuries, soft tissues edema and cranial nerve injuries. Well-known postoperative complications are infections, wound dehiscence, CSF leak and meningitis, velopalatine incompetence (clinically evident as nasal speech, dysphagia and regurgitation of liquids) and CVJ instability even in patients submitted to instrumentation. We report the case of a 7-year-old boy with a complex craniovertebral junction malformation who underwent transoral odontoidectomy and posterior fixation that showed a complete regrowth of the odontoid process and symptoms relapse at 2 years follow-up. Complete spontaneous bone regeneration has been occasionally described in other craniofacial bones such as in mandible after partial mandibulectomy even in elderly patients. Several conditions have been suggested to possibly influence this rare bone regeneration: young age; infections/inflammations; development of a new bone from intact periosteum, its fragments, regenerated juvenile periosteum or post-surgical immobilization. We believe that the possible explanation could be in the exact knowledge of the local embryology of the ossification centres. In fact the inclusion in the odontoid resection of the dentocentral syncondrosis, still potentially active in regrowth, could overcome such an indesiderable complication. A more caudal resection down to the dentocentral syncondrosis when dealing with an anterior CVJ can be realistically required in children below 10 years of age.