Atlantoaxial tumor

Atlantoaxial tumors account for a substantial proportion of primary bone tumors in children. Before resection, surgeons must consider the complex regional anatomy, the potential for neurological compromise, craniocervical instability, and the question of tumor resectability in a growing spine.

In 23 children whose primary atlantoaxial bone tumors were treated from 1996 through 2010, there were 4 aneurysmal bone cysts, 2 osteochondromas, 5 chordomas, 4 osteoblastomas, 3 fibrous dysplasias, 4 eosinophilic granulomas, and 1 Ewing's sarcoma. Clinical presentation consisted of neck pain (n = 23), headaches and occipital pain (n = 16), myelopathy (n = 8), and torticollis (n = 4). Selective angiography and coil embolization were undertaken for all patients with aneurysmal bone cysts and osteoblastomas, 2 patients with chordomas, 1 patient with fibrous dysplasia, and 1 patient with Ewing's sarcoma. Primary embolization treatment of radiation-induced aneurysmal bone cyst of the atlas showed complete reossification. Results of CT-guided needle biopsy were diagnostic for 1 patient with eosinophilic granuloma and 1 with Ewing's sarcoma. Needle biopsies performed before referral were associated with extreme blood loss for 1 patient and misdiagnosis for 2 patients. Surgery involved lateral extrapharyngeal, transoral, posterior, and posterolateral approaches with vertebral artery rerouting. Complete resection was possible for 9 patients (2 with osteochondroma, 3 with fibrous dysplasia, 2 with chordoma, and 2 with osteoblastoma). Decompression and internal fusion were performed for 3 patients with aneurysmal bone cysts. Of the 23 patients, 7 underwent dorsal fusion and 4 underwent ventral fusion of the axis body. Chemotherapy was necessary for the patients with eosinophilic granuloma with multifocal disease and for the patient with Ewing's sarcoma. There was no morbidity, and there were no deaths. All patients with benign lesions were free of disease at the time of the follow-up visit (mean ± SD follow-up 8.8 ± 1.1 years; range 2-18 years). Chordomas received proton or LINAC irradiation, and as of 4-15 years of follow-up, no recurrence has been noted.

Because most atlantoaxial tumors in children are benign, an intralesional procedure could suffice. Vascular control and staged resection are critical. Ventral transoral fusion or lateral extrapharyngeal fusion has been successful. Resection with ventral fusion and reconstruction are essential for vertebral body collapse. Management of eosinophilic granulomas must be individualized and might require diagnosis through needle biopsy [1].

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Menezes AH, Ahmed R. Primary atlantoaxial bone tumors in children: management strategies and long-term follow-up. J Neurosurg Pediatr. 2014 Jan 17. [Epub ahead of print] PubMed PMID: 24437986.