

Extradural Transjugular Transsigmoid Approach with High Cervical Exposure for Glomus Jugulare Tumor

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Abstract

Surgical removal of glomus jugulare tumors is challenging owing to the complex anatomy of the temporal bone and craniocervical region, aggressive tumor invasion into the nearby structures, and their hypervascularity. However, recent advances in skull base techniques, intraoperative neuromonitoring, and radiological interventions have enabled their relatively safe resection, while giving priority to functional preservation. This video demonstrates a case of a glomus jugulare tumor treated by the extradural transjugular transsigmoid approach with high-cervical exposure and tympanoplasty, after preoperative embolization. A 47-year-old woman presented with progressive hearing disturbance, pulsatile tinnitus, and hemifacial spasm. Neuroimaging displayed a hypervascular tumor occupying the temporal bone, extending to the cervical region through the jugular foramen, and to the external auditory canal. Preoperative feeder occlusion was successfully performed without any additional symptoms, while carefully evaluating the provocative test. Near-total resection of the tumor was achieved through the transjugular transsigmoid approach with high-cervical exposure under detailed neuromonitoring, including continuous facial nerve monitoring and auditory brainstem response. In this patient, in whom the tumor did not invade intradurally and the sigmoid sinus was already occluded preoperatively, the sinus was managed only by coagulation, to avoid unnecessary dural opening and the risk of cerebrospinal fluid leakage. Anterior facial nerve rerouting was not required since the tumor removal was accomplished through the corridor above and below the fallopian bridge. The patient had no new neurological deficits, and her pulsatile tinnitus and hemifacial spasm disappeared after the surgery. Her hearing disturbance improved postoperatively. The link to the video can be found at: https://youtu.be/gqf3dxHlv_0.

Keywords

- ▶ head and neck
- ▶ infralabyrinthine approach
- ▶ infratemporal fossa
- ▶ jugulotympanic paraganglioma
- ▶ postauricular transtemporal



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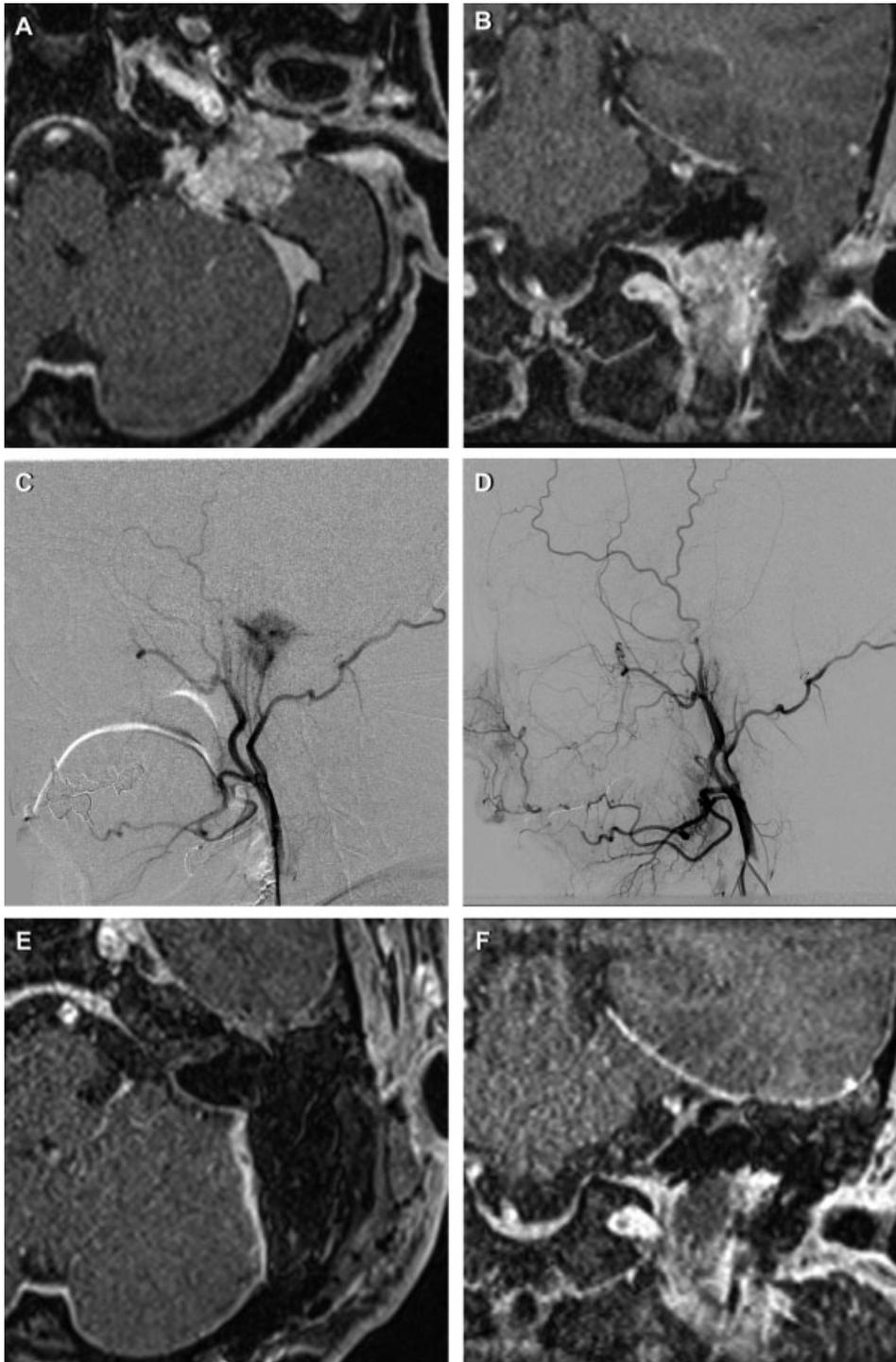


Fig. 1 Preoperative post-gadolinium T1-weighted MRIs show a left glomus jugulare tumor extending extracranially (A and B). The tumor was highly vascularized by the stylomastoid, ascending pharyngeal, and posterior auricular arteries (C), and preoperative embolization significantly decreased the tumor staining (D). Postoperative MRIs confirmed successful resection through the transjugular transsigomid approach (E and F).

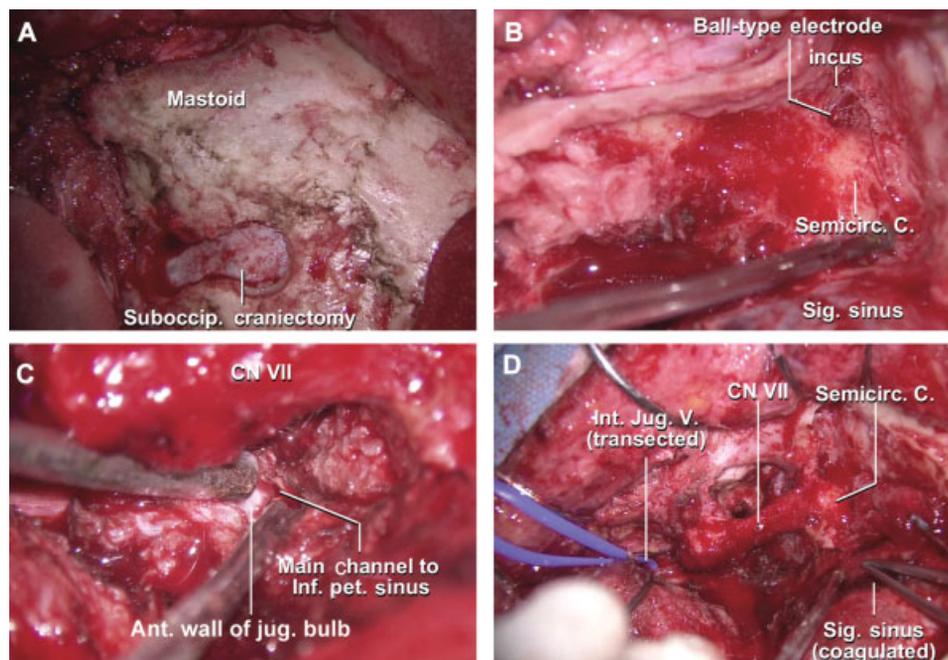


Fig. 2 (A) The left mastoid bone was exposed and small suboccipital craniectomy was performed. (B) To continuously assess the neural condition in real-time without disturbing the microsurgical procedure, the evoked facial electromyogram was monitored with electrical stimulation at a frequency of 1 Hz throughout the procedure, with a ball-type stimulating electrode placed in the aditus. (C) The intrajugular tumor was dissected, while preserving the anterior wall of the jugular bulb. Venous flow from the inferior petrosal sinus was encountered, and the hemorrhage was promptly controlled using fibrin glue-soaked hemostatic material. (D) The intrapetrous tumor was resected through the corridor above and below the fallopian bridge, while preserving the facial nerve and semicircular canals. The intrajugular and extracranial tumors were also resected after ligation of the internal jugular vein. In this patient, in which the tumor did not invade intradurally and the sigmoid sinus was already occluded preoperatively, the sinus was managed only by coagulation, to avoid unnecessary dural opening and the risk of cerebrospinal fluid leakage. Ant., anterior; C., canal; CN, cranial nerve; Inf., inferior; Int., internal; Jug., jugular; Pet., petrosal; Semicirc., semicircular; Sig., sigmoid; Suboccip., suboccipital; V., vein.

Conflict of Interest

The authors have no conflicts of interest associated with this study.

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