

# Management of complex jugular paragangliomas: surgical resection and outcomes

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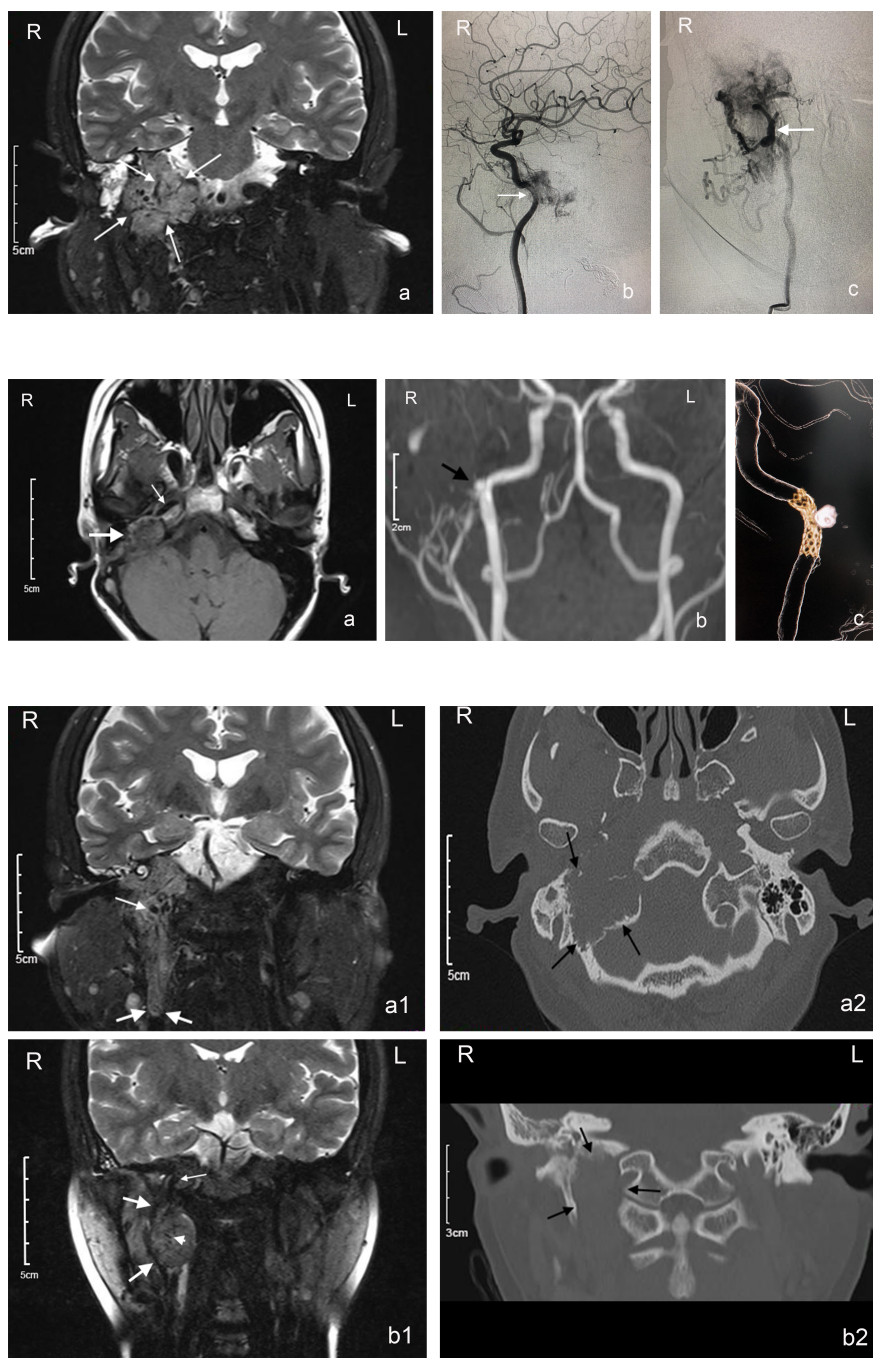
## Abstract

**Objectives:** To review surgical outcomes in patients with complex jugular paragangliomas(CJPs)and to refine the surgical strategies for CJPs. **Design:** A retrospective study . **Setting:** A single university hospital. **Participants:** Twelve patients with CJPs diagnosed in our institution from January 2013 to January 2021. **Main Outcome Measures:** Individualized surgical strategies, tumor control, complications, function of facial nerve (FN) and lower cranial nerves (LCNs), postoperatively. **Results:** Gross-total resection was achieved for 9 (75%) patients, and subtotal resection was achieved for 3(25%) patients. The surgical tumor control rate was 100% after a mean follow-up of 37.5 months. New FN dysfunction occurred in 33.3% (4/12) of patients, including 3 patients restored to HB grade II postoperatively, and new LCNs deficits occurred in 16.7% (2/12) patients. One patient suffered from mild hemiparesis as a result of postoperative lacunar cerebral infarction resolved two months later. No other obvious complications noted in our series. **Conclusion:** Our unique refined surgical techniques, including tension-free anterior FN rerouting, sigmoid sinus tunnel-packing and push-packing techniques, were able to achieve maximum tumor control and cranial nerves preservation. A two-stage surgery should be applied to minimize the risk of bilateral cranial neuropathies and impact on cerebral circulation in patients with bilateral paragangliomas. The preoperative endovascular intervention such as coil embolization or internal carotid artery (ICA) stenting can be employed in management paragangliomas with ICA associated lesions.

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