Suboccipital Craniectomy and C1-C2 Laminectomies for Resection of Calcified Intradural-Extramedullary Meningioma with Arterial Encasement of PICA

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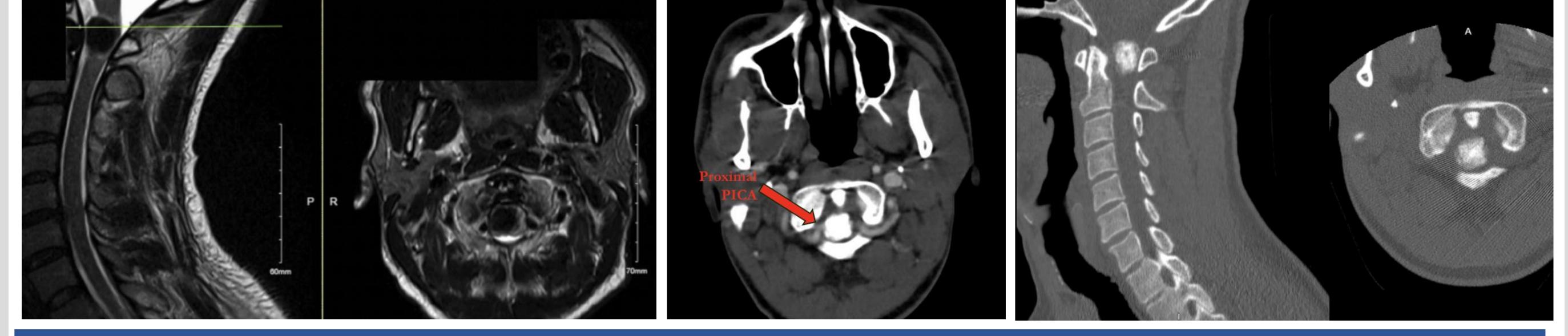
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Abstract

A 40-year-old male who presented with significant right upper and lower extremity weakness, with numbness in the right upper and lower extremities. He was found to have a large, calcified intradural, extramedullary lesion at C1-2 with arterial encasement of the right PICA. In order to prevent progression of symptomatic cervical cord compression, the patient underwent a suboccipital craniectomy and C1-2 laminectomies for resection of the mass. Gross total resection of the mass was observed on postoperative imaging, with patency of PICA confirmed with intraoperative ICG.

Preoperative Imaging

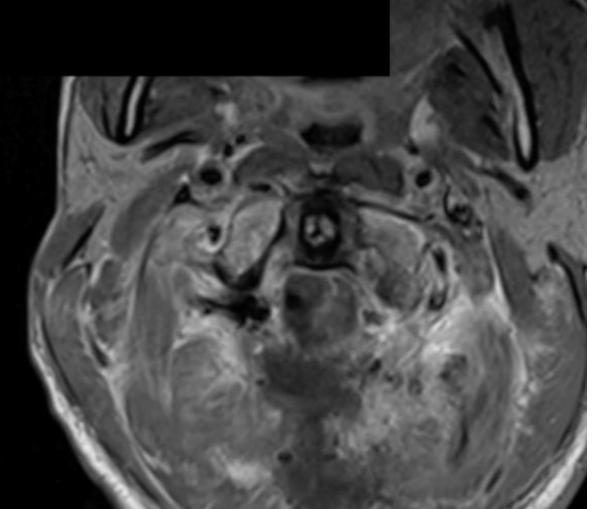


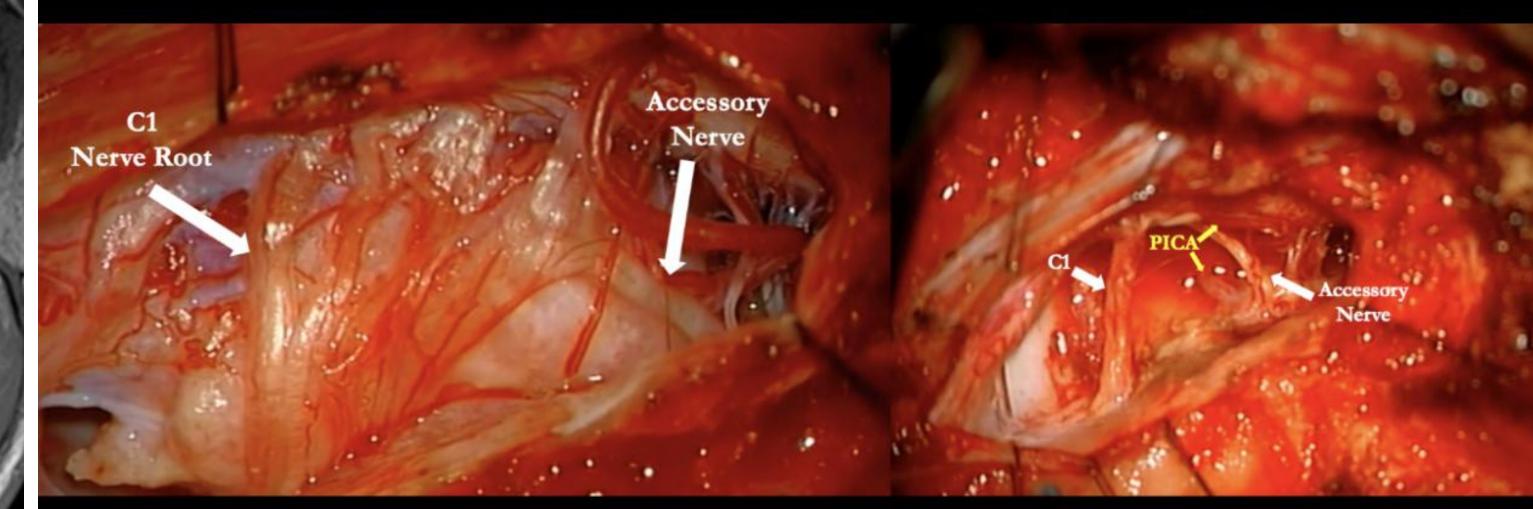
Postoperative Imaging and Results

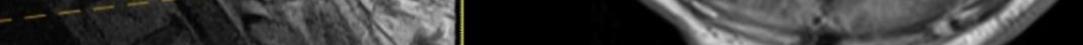


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Technical Considerations

Preservation of encased PICA with sharp dissection Use of ultrasonic aspirator to debulk calcified tumor Allows minimization of manipulation of the surrounding cord

Disease Background

Spinal cord meningiomas comprise 3% of primary CNS tumors¹ Most prevalent adult intradural, extramedullary tumor² Least common location for meningiomas² Account for 1%-13% of all meningiomas³

Typically present with symptoms of cord compression⁴ or back pain⁵

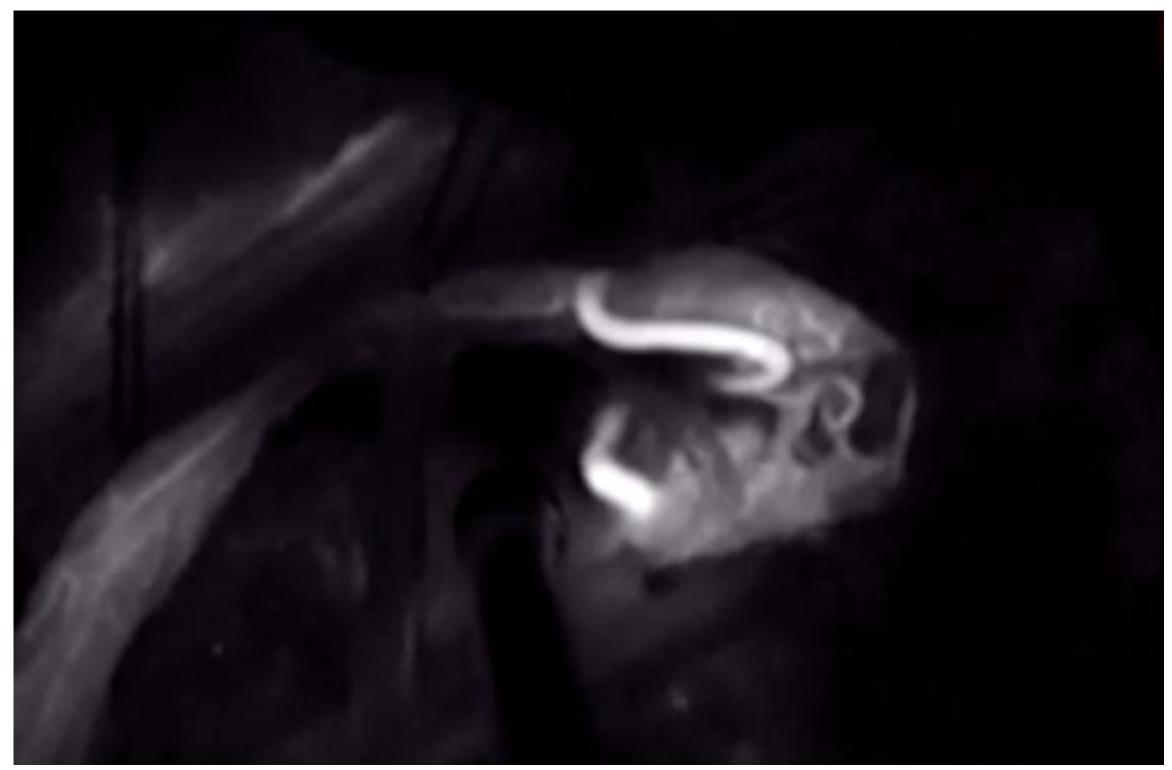
Calcification is inversely related to extent of resection^{6,7}, postoperative complications and neurological outcome⁸

Before Tumor Resection



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Intraoperative ICG showing patent PICA following tumor resection

Clinical Outcome

Discharged home on POD#9

Significantly improved motor exam at 6 month clinic

follow-up

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References

- Ostrom QT, Gittleman H, Liao P, et al. CBTRUS statistical report: primary brain and central nervous system tumors diagnosed in the United States in 2007-2011. Neuro Oncol. 2014;16 Suppl 4(Suppl 4):iv1-iv63. doi:10.1093/neuonc/nou223
- Dang DD, Mugge LA, Awan OK, Gong AD, Fanous AA. Spinal Meningiomas: A Comprehensive Review and Update on Advancements in Molecular Characterization, Diagnostics, Surgical Approach and Technology, and Alternative Therapies. Cancers (Basel). 2024;16(7):1426. Published 2024 Apr 7. doi:10.3390/cancers16071426
- Hohenberger C, Hau P, Schebesch KM, et al. Spinal meningiomas. *Neurooncol Adv.* 2023;5(Suppl 1):i112-i121. Published 2023 Jun 3. doi:10.1093/noajnl/vdad013
- Jamilson Araújo Pereira B, Nogueira de Almeida A, Silva Paiva W, Henrique Pires de Aguiar P, Jacobsen Teixeira M, Kazue Nagahashi Marie S. Neuro-oncological features of spinal meningiomas: Systematic review. Neurochirurgie. 2020;66(1):41-44. doi:10.1016/j.neuchi.2019.09.027
- Yamaguchi S, Menezes AH, Shimizu K, et al. Differences and characteristics of symptoms by tumor location, size, and degree of spinal cord compression: a retrospective study on 53 surgically treated, symptomatic spinal meningiomas. J Neurosurg Spine. 2020;32(6):931-940. Published 2020 Jan 31. doi:10.3171/2019.12.SPINE191237
- Sandalcioglu IE, Hunold A, Müller O, Bassiouni H, Stolke D, Asgari S. Spinal meningiomas: critical review of 131 surgically treated patients. Eur Spine J. 2008;17(8):1035-1041. doi:10.1007/s00586-008-0685-y
- Levy WJ Jr, Bay J, Dohn D. Spinal cord meningioma. J Neurosurg. 1982;57(6):804-812. doi:10.3171/jns.1982.57.6.0804
- Ruggeri AG, Fazzolari B, Colistra D, Cappelletti M, Marotta N, Delfini R. Calcified Spinal Meningiomas. World Neurosurg 2017;102:406-412. doi:10.1016/j.wneu.2017.03.045