

Microsurgical Resection of Craniocervical Dermoid Cyst by Far Lateral Approach: Case Report and Literature Review

Ressecção microcirúrgica de cisto dermoide pela abordagem extremo-lateral: relato de caso e revisão da literatura

Lucas Crociati Meguins¹ Antonio Ronaldo Spotti¹ Dionei Freitas de Moraes¹
Carlos Eduardo Dall'Aglio Rocha¹ Ricardo Lourenço Caramanti¹ Mario José Góes¹

¹ Department of Neurologic Sciences, Hospital de Base, São José do Rio Preto, São Paulo, Brazil

Arq Bras Neurocir 2018;37:339–342.

Address for correspondence Lucas Crociati Meguins, MD, Departamento de Ciências Neurológicas, Hospital de Base, Av. Brigadeiro Faria Lima, 5544, São José do Rio Preto, SP 15090-000, Brazil (e-mail: lucascrociati@hotmail.com).

Abstract

Introduction Intracranial dermoid tumors represent a rare clinical entity that accounts for 0.04 to 0.6% of all intracranial tumors. Their location in the posterior fossa is uncommon.

Objectives To report the case of a young woman with a posterior fossa dermoid cyst treated by right far lateral approach.

Case Report A 17-year-old woman presenting with swallowing difficulties for 6 weeks was referred for a neurological investigation. A magnetic resonance imaging (MRI) scan showed a hyperintense T1-weighted large expansive lesion occupying the posterior fossa and compressing the anterior face of the brain stem and cerebellum. The patient underwent surgical treatment by right far lateral approach with decompression of vascular and neural structures. The patient presented an uneventful recovery, and was discharged home on the fourth postoperative day without any additional neurological deficits. The anatomopathological analysis confirmed the diagnosis of dermoid cyst.

Conclusion The far lateral approach is a safe and feasible route to appropriately treat large posterior fossa dermoid cysts. Decompression of vascular and neural structures is essential to achieve good symptom control.

Keywords

- dermoid cyst
- far lateral approach

Resumo

Introdução Tumores dermoides intracraniais são casos clínicos raros que representam de 0,04 a 0,6% de todos os tumores intracraniais. Sua localização na fossa posterior é incomum.

Objetivos Relatar o caso de uma jovem com cisto dermoide na fossa posterior tratado pela lateral direita.

Relato de Caso Paciente de 17 anos apresentando dificuldades de engolir há seis meses encaminhada para investigação neurológica. Imagem de ressonância magnética

Palavras-chave

- cisto dermoide
- abordagem extremo-lateral

mostrou uma lesão larga hipertensa T1 ocupando a fossa posterior e comprimindo a face anterior do tronco cerebral e cerebelo. A paciente foi submetida a tratamento cirúrgico pela abordagem extremo-lateral direita com descompressão das estruturas vascular e neural. A paciente apresentou rápida melhora e recebeu alta 4 dias após o procedimento sem nenhum déficit neurológico. A análise anatomopatológica confirmou o diagnóstico de cisto dermoide.

Conclusão A abordagem extremo-lateral direita é o acesso mais seguro e factível para tratar apropriadamente largos cistos dermóides na fossa posterior. Descompressão das estruturas vascular e neural é fundamental para alcançar bom controle sintomático.

Introduction

Dermoid cysts, also called dermoid tumors, are extremely rare benign congenital cystic masses of embryological origin that account for 0.04 to 0.6% of all intracranial tumors.¹⁻⁴ Dermoid and epidermoid cysts arise from defects in the separation of the neuroectoderm during the formation of the neural tube, leading to sequestration of ectodermal remnants, and intracranial dermoid cysts occur at either end of the neuraxis and mostly near the midline.⁵⁻⁷ Intracranial dermoids are found in the posterior fossa, supra, and parasellar regions.⁸⁻¹⁰ Dermoids enlarge slowly and accumulate viscous or semi-solid yellow material composed of desquamated epithelium, sebaceous gland secretions, fat, oil, and hair. The presence of skin components (hair follicles, sebaceous, and sweat glands) in the cyst wall and contents distinguishes dermoids from epidermoid cysts.¹¹

The aim of the present study is to describe the case of a young woman with a posterior fossa dermoid cyst treated by right far lateral approach.

Case Report

A 17-year-old woman presenting with swallowing difficulties and headaches that had begun six weeks before was referred for a neurological investigation. The neurological examination revealed no motor deficits or cranial nerve palsy. A magnetic resonance imaging (MRI) scan showed a hyperintense T1-weighted large expansive lesion occupying the posterior fossa and compressing the anterior face of the brain stem and cerebellum (► **Fig. 1**). The patient underwent surgical treatment by right far lateral approach on lateral position with cyst resection and decompression of vascular and neural structures (► **Figs. 2 and 3**). The patient presented an uneventful recovery, and was discharged home on the fourth postoperative day without any additional neurological deficits. The anatomopathological analysis confirmed the diagnosis of dermoid cyst.

Discussion

Dermoid cysts, also called dermoid tumors, are extremely rare benign congenital cystic masses of embryological origin that account for 0.04 to 0.6% of all intracranial tumors.¹⁻⁴

Moreover, intracranial dermoid cysts have the component of keratinized squamous epithelium originated from the ectoderm, and composed of dermal materials like hair and sebaceous glands.⁵⁻⁷ They are ~ 3 to 10 times less frequent than epidermoid tumors, and have a tendency of being located near the subarachnoid space, sulci or fissures because of the space that presents minimal resistance to an easy growth rate, and the midline in the base of the skull.^{12,13}

Dermoid tumors located in the posterior fossa are frequent and usually require an appropriate surgical route to minimize brain retraction, postoperative edema and risk of recurrence.^{14,15} The far lateral approach seems to be an excellent route to totally remove posterior fossa lesions that occupy the most anterior face of brain stem, cerebellum and ventral foramen magnum.^{16,17} This approach has been used for many neurosurgical pathologies of the posterior fossa, including tumors, such as meningioma and chordoma, and posterior circulation aneurysm.¹⁸⁻²¹ Large cystic lesions involving the craniocervical junctions are also described as possible indications for a far lateral approach, once a better operative view of the cysts in the ventral dural space of the lower clivus and foramen magnum, and less risk of trauma to the brain stem and cervical cord, can be easily achieved with this approach.²²

There are many descriptions of the far lateral approach technique. Classically, the standard incision for the far lateral suboccipital approaches has been the "reverse hockey stick" incision, in which the skin and muscles of the suboccipital area are elevated and reflected inferiorly.¹⁴⁻¹⁷ However, Lau and colleagues²¹ proposed a C-shape incision as an alternative to reduce muscle retraction and postoperative cervical pain. Vertebral artery exposure is also an essential step to safely perform the approach. Campero and colleagues²³ highlighted the nuchal lines as anatomical landmarks to appropriately dissect the suboccipital muscles and expose the vertebral artery before performing the craniotomy. In the present report, we performed the far lateral approach to safely remove the lesion and preserve the neural and vascular structures compressed by the cyst.

In conclusion, the far lateral approach provides adequate exposure for the surgical treatment of ventral lesions in the craniocervical junction. Minimal retraction, preservation of involved neural structures and a refined microsurgical technique are the most important steps to safely remove dermoid cysts of the posterior fossa.

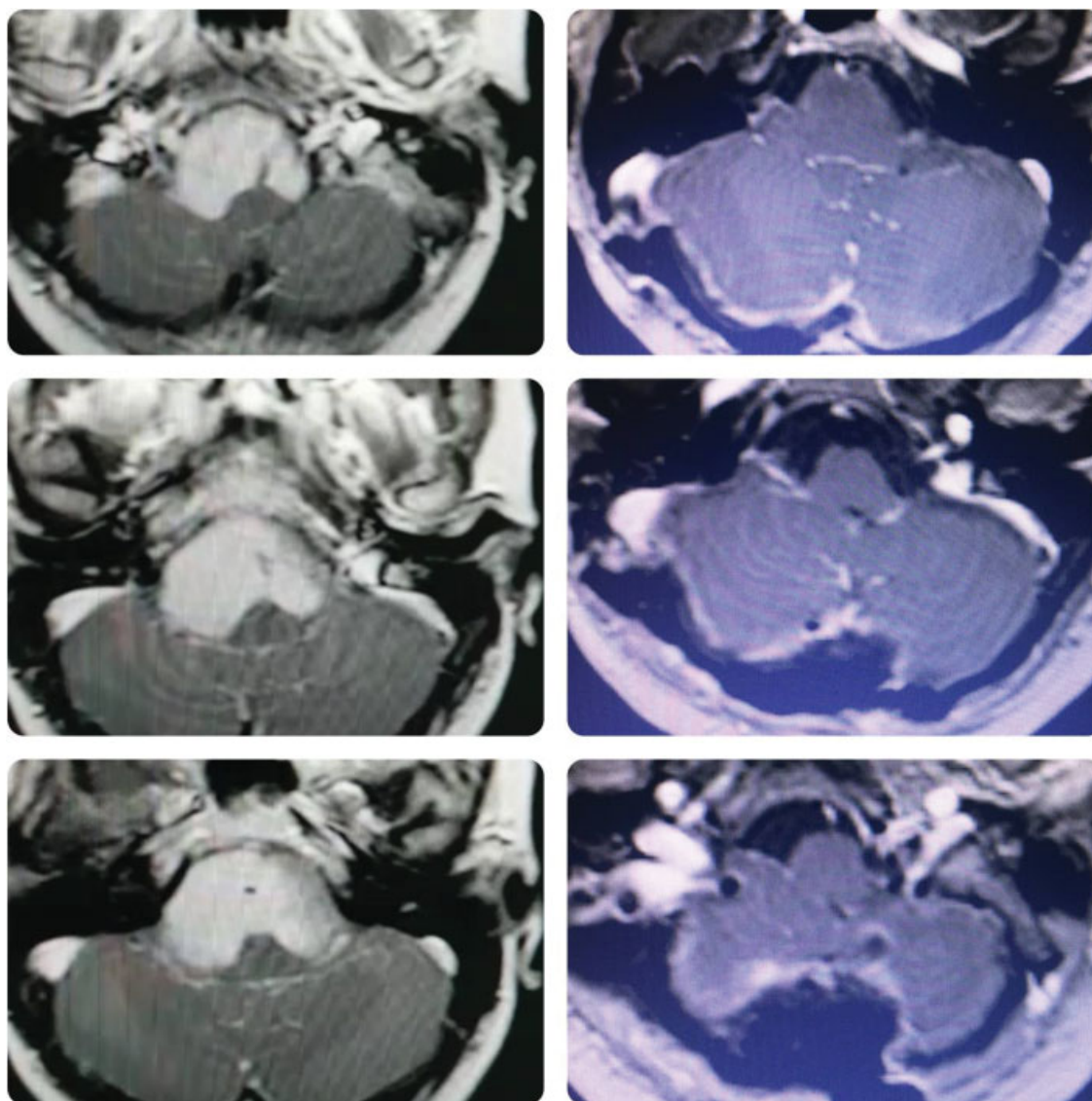


Fig. 1 Magnetic resonance imaging scan showing an expansive lesion occupying the posterior fossa (right: preoperative images; left: postoperative images).



Fig. 2 Patient positioning on left decubitus and drawing of skin incision performed in the right far lateral approach.



Fig. 3 Intraoperative final view after total resection of the cystic lesion.

Conflicts of Interest

The authors have none to declare.

References

- 1 Badri M, Gader G, Bahri K, Zammel I. Atypical imaging features of posterior fossa's dermoid cyst: Case report and review of literature. *Surg Neurol Int* 2018;9:97
- 2 Skovrlj B, Mascitelli JR, Steinberger JM, Weiss N. Progressive visual loss following rupture of an intracranial dermoid cyst. *J Clin Neurosci* 2014;21(01):159–161
- 3 Ramlakhan R, Candy S. Traumatic rupture of an intracranial dermoid cyst. *Radiol Case Rep* 2015;10(01):1053
- 4 Şalçini C, Hatıloğlu D, Evrensel A, Tanrıdağ AO. Episodic headache due to ruptured intracranial dermoid cyst. *BMJ Case Rep* 2015;2015:2015
- 5 Lee B, Jeelani Y, McComb JG. Congenital dermal sinus with an infected dermoid cyst in the cervico-thoracic spinal cord. *Pediatr Neurosurg* 2013;49(02):89–92
- 6 Kosuge Y, Onodera H, Sase T, et al. Ruptured dermoid cyst of the lateral cavernous sinus wall with temporary symptoms: a case report. *J Med Case Reports* 2016;10(01):224
- 7 Abouhassan W, Chao JK, Lehman JA Jr. Massive Intradural Dermoid Cyst Without Sinus Tract. *J Craniofac Surg* 2017;28(07):e711–e713
- 8 Endo H, Murakami K, Watanabe M, Tominaga T. Extradural dermoid cyst of the parasellar region: a case report. *Skull Base Rep* 2011;1(01):3–6
- 9 Wani AA, Raswan US, Malik NK, Ramzan AU. Posterior fossa ruptured dermoid cyst presenting with hydrocephalus. *Neurosciences (Riyadh)* 2016;21(04):358–360
- 10 Tan LA, Kasliwal MK, Harbhajanka A, Kellogg RG, Arvanitis LD, Munoz LF. Hyperdense suprasellar mass: An unusual radiological presentation of intracranial dermoid cyst. *J Clin Neurosci* 2015;22(07):1208–1210
- 11 Esquenazi Y, Kerr K, Bhattacharjee MB, Tandon N. Traumatic rupture of an intracranial dermoid cyst: Case report and literature review. *Surg Neurol Int* 2013;4:80
- 12 Lunardi P, Missori P. Supratentorial dermoid cysts. *J Neurosurg* 1991;75(02):262–266
- 13 Yaşargil MG, Abernathey CD, Sarioglu AC. Microneurosurgical treatment of intracranial dermoid and epidermoid tumors. *Neurosurgery* 1989;24(04):561–567
- 14 Raghunath A, Indira Devi B, Bhat DI, Somanna S. Dermoid cysts of the posterior fossa—morbid associations of a benign lesion. *Br J Neurosurg* 2013;27(06):765–771
- 15 Vlachakis E, Alexiou GA, Stefanaki K, Sfakianos G, Prodromou N. Posterior fossa dermoid cyst. *J Pediatr Neurosci* 2012;7(01):79
- 16 Huang J, Dai M, Cheng C, et al. Far-lateral approach assisted by multimodal neuronavigation and electrophysiological monitoring technique for complex clival tumor. *Br J Neurosurg* 2015;29(04):597–599
- 17 Moscovici S, Umansky F, Spektor S. “Lazy” far-lateral approach to the anterior foramen magnum and lower clivus. *Neurosurg Focus* 2015;38(04):E14
- 18 Kryzanski JT, Robertson JH, Heilman CB. A minimal access far-lateral approach to foramen magnum lesions. *J Neurol Surg B Skull Base* 2014;75(04):236–242
- 19 Nanda A, Konar S, Bir SC, Maiti TK, Ambekar S. Modified Far Lateral Approach for Posterior Circulation Aneurysms: An Institutional Experience. *World Neurosurg* 2016;94:398–407
- 20 Neil JA, Garber ST, Dailey AT, Couldwell WT. Management of Complex Pediatric Chordoma: Transnasal and Bilateral Far-Lateral Approach for Resection With O-C4 Fusion: 3-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)* 2016;12(04):392
- 21 Lau T, Reintjes S, Olivera R, van Loveren HR, Agazzi S. C-shaped Incision for Far-Lateral Suboccipital Approach: Anatomical Study and Clinical Correlation. *J Neurol Surg B Skull Base* 2015;76(02):117–121
- 22 Shi W, Cui DM, Shi JL, Gu ZK, Ju SQ, Chen J. Microsurgical excision of the craniocervical neurenteric cysts by the far-lateral transcondylar approach: case report and review of the literature. *Skull Base* 2010;20(06):435–442
- 23 Campero A, Villalonga JF, Elizalde RL, Ajler P. The Nuchal Lines as Anatomic Landmarks to Dissect the Muscles in the Far Lateral Approach. *World Neurosurg* 2018;113:188–194