

Quadrigeminal cisterna lipoma. Report of two cases and literature review

Lipoma da cisterna quadrigeminal. Relato de dois casos e revisão da literatura

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Abstract

Intracranial lipomas are congenital, benign and slow-growing tumors. The incidence were 0.1 to 0.5% of all primary brain tumors and are often diagnosed in incidental findings of neuroradiological investigation. Lipoma in quadrigeminal region occurs in 25% of intracranial lipomas and has been reported as lipomas in quadrigeminal cistern (perimesencephalic cistern), quadrigeminal plate, ambiens cistern or superior medullary velum. MRI is the most major exam. The treatment is conservative in most cases, surgical removal is hampered by their deep location and contiguous with adjacent neurovascular structures. The authors report two cases of lipoma in the quadrigeminal region, incidental findings and discuss the clinical findings, neuroimaging and treatment.

Key words: Intracranial lipoma, magnetic resonance, quadrigeminal cistern lipoma, treatment.

Resumo

Lipomas intracranianos são tumores congênito, benigno e de crescimento lento. Sua incidência é de 0.1 a 0.5% de todos os tumores cerebrais primários e são frequentemente diagnosticados em achados incidental de investigação neuroradiológica. Lipoma na região quadrigeminal ocorre em 25% dos lipomas intracranianos e tem sido relatados como lipomas na cisterna quadrigeminal (cisterna perimesencefálica), placa quadrigeminal, cisterna ambiens ou véu medular superior. O exame de eleição é ressonância magnética. O tratamento é conservador na maioria dos casos, a remoção cirúrgica é dificultada pela sua localização profunda e da contiguidade com estruturas neurovasculares adjacentes. Os autores relatam dois casos de lipoma na região quadrigeminal achados incidentalmente e discutem os achados clínicos, imagem e tratamento.

Palavras-chave: Lipoma intracraniano, ressonância magnética, lipoma cisterna quadrigeminal, tratamento.

Introduction

Intracranial Lipoma (ICL) is rare disease and results from abnormal men-

ingeal primitival persistence¹. The ICL quadrigeminal cistern is located in over 20% of all LIC^{2,3,4,5,6,7}. In most cases are asymptomatic and neuroimaging

examination incidental finding^{8,9}. Magnetic resonance imaging (MRI) has been helpful in the diagnosis. The conservative treatment has been indicated

in cases of incidental findings and asymptomatic.

Histopatología

From the macroscopic point of view, it presents soft consistency, mobile, painless. It consists of mature adipose tissue, with varied amount of collagen in contact points with nerve tissue and varying degrees of vascularization^{22,23,24,25}. The growth pattern of lipomas is usually closer to the hamartomas than to the other neoplasias. May be part of teratomas, present component osteocartilaginoso, or Schwann cell proliferation nests. Calcification can occur, in which case they are called osteolipomas. These usually develop in suprasellar / interpeduncular region, it is characterized by a central arrangement of fat and peripheral bone^{26,27}.

Intracranial lipomas are rare tumors and adipose match between 0.06% and 0.46% of all intracranial tumors. They cause rare symptoms, therefore they are hardly detected. In general, lipomas are associated with other congenital anomalies, including agenesis of the corpus callosum, or represent incidental findings related to other non-related clinical manifestations²⁷.

In a series of 13 patients Budka, only one patient symptoms were attributed to injury. More than 50% of patients present with seizures and almost 20% of patients have mental retardation. Maiuri et al., reviewed 200 published cases of intracranial lipomas and found that 65% were in the corpus callosum, 13% in ambiens cistern, 13% in quiasmatic cistern and interpeduncular, 6,5% in the cerebellopontine angle. These the most rare localization tumor, but are the most symptomatic. The cistern ambiens 20% of cases were symptomatic²⁸.

Some authors believe that the genesis are to be tumors include, locate the midline and often relate to the neural tube disorders. Others believe that it fails to differentiate primitive meningeal tissue in the interhemispheric fissure, dysgenesis meningeal vascular mesenchyme or, secondarily interfered with Development also of the midline structures^{24,25}.

Anatomic considerations

The cistern quadrigeminal is defined as the cistern localisation posterior quadrigeminal plate and also referred as Cistern Galen vein. It communicates superiorly with the pericallosa posterior

cistern, inferiorly to the cerebellum-mesencephalic cistern, inferolaterally with the posterior part of the ambiens cistern and laterally retrolambica cistern. The cerebellum-mesencephalic cistern, also called precentral cerebellar cistern, extends the cerebellum-mesencephalic fissure. The ambient cistern is a narrow connecting channel bounded medially by the mesencephalus, superiorly by the thalamus pulvinar and laterally by subiculum, dentate gyrus and fornix fimbria^{28,29}.

Despite the anatomical patterns well defined by Rethon, find it out in literature some conflict setting. Maiuti et al., considered lipomas located in the cistern quadrigeminal, cerebellum-mesencephalic and ambiens as lipoma ambiens cistern. Combining the above with lipomas magna cistern, Baesa et al, classify them with lipoma of the dorsal region of the brainstem²⁹.

The authors present two cases of ICL located in quadrigeminal cistern. They are discussed clinical picture, imaging findings and conduct.

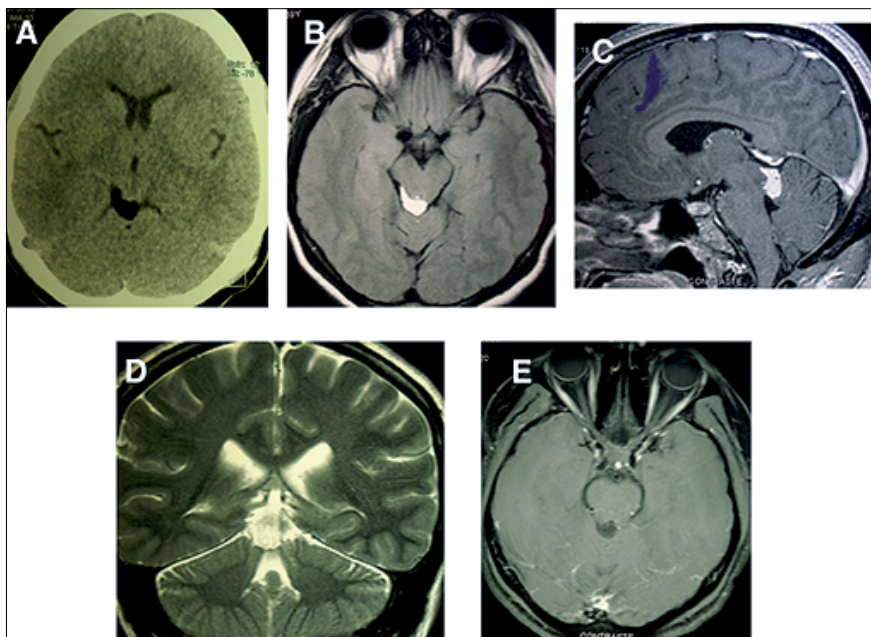
Case reports

Case 1

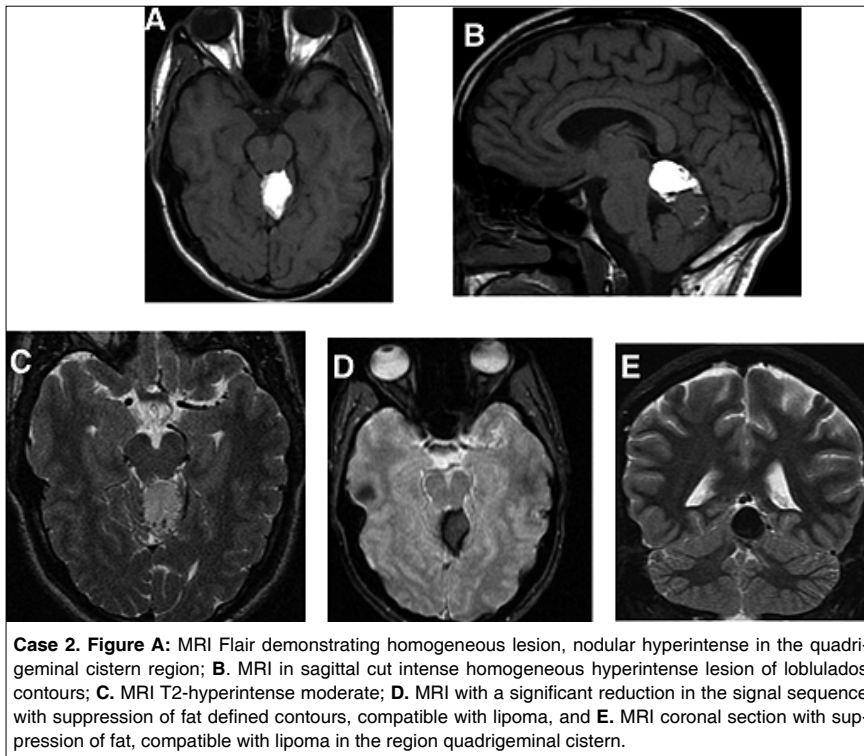
MLSS, female, 39 years old, home general service. Traffic accident victim. The patient was admitted in emergency room with headache and sleepy. Neurological examination: no focal neurological deficit. Coma Scale Glasgow (CSG) on admission was 14. CT scan without contrast: presence of hypodense lesion in the quadrigeminal cistern region (Figure 1A). MRI of the skull: hyperdense lesion in T1 and T2, located in quadrigeminal cistern region, absence of hydrocephalus and compression of adjacent structures (Figures 1B, 1C, 1D and 1E). Received hospital discharge. The patient were being oriented outpatient treatment of intracranial lipoma.

Case 2

AMJ, female, 46 years old, home general service. History holocranial headache in several years. Mild headache that it gives up of using just simple analgesics. Neurological examination: normal. MRI of the skull: presence of lesions with hyperintense on T1 and T2, located in quadrigeminal cistern region without mass effect (Figures 2A, 2B, 2C, 2D, 2E). Oriented periodic outpatient evaluation.



Case 1. Figure A: CT scan showing lesion with fat density (-80 UH) the right quadrigeminal cistern; **B:** MRI Flair: demonstrating homogeneous lesion, nodular, compatible with lipoma; **C:** MRI in sagittal T1 hyperintense lesions presenting in quadrigeminal cistern; **D:** MRI coronal section and **E:** MRI T2 image suppression for fat showing injury in the right region of the quadrigeminal cistern compatible with lipoma.



Case 2. Figure A: MRI Flair demonstrating homogeneous lesion, nodular hyperintense in the quadrigeminal cistern region; **B:** MRI in sagittal cut intense homogeneous hyperintense lesion of lobulados contours; **C:** MRI T2-hyperintense moderate; **D:** MRI with a significant reduction in the signal sequence with suppression of fat defined contours, compatible with lipoma, and **E:** MRI coronal section with suppression of fat, compatible with lipoma in the region quadrigeminal cistern.

Discussion

ICL is a benign congenital malformation with slow growth behavior. It is between 0.1% to 0.5% of intracranial tumors^{7,10,11}. According to Maiuri et al⁴ 20%, ICL are located in the quadrigeminal cistern and develop symptoms. ICL may occur if the quadrigeminal cistern, despite the small size cause symptoms¹². However, it may produce symptoms due to compression exerted on the surrounding structures^{2,3,4,13}. The clinical manifestations of ICL are: seizures (30%), headache (25%), mental disorders (15%) and asymptomatic

in one third of cases¹. The most common symptom is headache in adults when becomes symptomatic⁹, a fact that occurred in our cases. The ICL located in the quadrigeminal cistern are mostly asymptomatic, but may have ataxic gait, obstructive hydrocephalus, look paralysis or involvement of the trochlear nerve and seizures^{6,11,12,14}. Our patients had headache and absence of obstructive hydrocephalus. CT scan shows low attenuation lesions, seen only in adipose tissue ranging from -40 to -100 Hounsfield unit^{10,15}. The MRI is the method of choice for the diagnosis^{16,17}. It is presented as hyper-

intense lesions on T1 and iso-hypointense T2 contrast misses, but in cases where the vascular lipoma component is important contrast enhancement occurs^{17,18}.

Surgical treatment has risks of complications due to the close relationship with blood vessels and cranial nerves and as well as the adhesion and infiltration of adipocytes^{10,18}. Thakkar et al²⁰ only recommended surgical access of ICL, when they grows large enough to cause mass effect or intracranial hypertension. Lipoma when it is very adherent to major vessels, despite microsurgical technique its preservation is difficult^{5,21}. Satyam et al²² this region resection has high morbidity and little benefit. Due to its low proliferative activity and a favorable biological course, does not require surgical treatment in cases of radiological findings and asymptomatic, a fact that we indicated in our patients the conservative treatment.

Conclusion

Intracranial lipoma is a rare malformation and benign, resulting from developmental disorders, and is often found associated with dysraphisms. It is usually asymptomatic or an incidental finding of imaging. With advances in imaging methods, an increase in the probability of detection of these lesions during life, even in asymptomatic patients. On the other hand, the diagnosis must lead to a search for other brain abnormalities, especially in the midline. Treatment is conservative in asymptomatic cases or incidental finding.

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References

- Fandiño J, Bermúdez J, Arán E. Lipoma de la cisterna cuadrigemina y cisura calcarían: caso clínico y revisión de la literatura. *Neurocirugía* 2005; 16(2): 173-176.
- Baesa S, Higgins MJ, Ventureyra RCG. Dorsal brainstem lipomas: case report. *Neurosurgery* 1996; 38(5): 1031-1035.
- Kazner E, Stochdorph O, Wende S, Grumme T. Intracranial lipoma: diagnostic and therapeutic considerations. *J Neurosurg* 1980; 52(2): 234-245.
- Maiuri F, Cirillo S, Simonetti L, De Simone MR, Gangemi M. Intracranial lipomas: diagnostic and therapeutic considerations. *J Neurosurg Sci* 1988; 32(4): 161-167.
- Nikaido Y, Imanishi K, Monobe T. Lipoma in the quadrigeminal cistern. Case report. *Neurol Med Chir (Tokyo)* 1995; 35(3): 175-178.
- Ono J, Ikeda T, Imai K, Mano T, Matsuoka T, Nagai T, Okada S. Intracranial lipoma of the quadrigeminal region associated with complex partial seizures. *Pediatr Radiol* 1998; 28(9): 729-731.
- Truwit CL, Barkovich AJ. Pathogenesis of intracranial lipoma: an MR study in 42 patients. *AJR Am J Neuroradiol* 1990; 155(4): 855-864.

8. Bilir O, Yavasi O, Ersunan G, Kayayurt K, Durakoglugil T. Incidental finding in a headache patient: intracranial lipoma. *West J Emerg Med* 2014; 15(4): 361-362.
9. Yilmaz MB, Egemen E, Tekiner A. Lipoma of the quadrigeminal cistern: Report of 12 cases with clinical and radiological features. *Turk Neurosurg* 2015; 25(1): 16-20.
10. Yildiz H, Kakyemez B, Koroglu M, Yesildag A, Baykal B. Intracranial lipomas: Importance of localization. *Neuroradiology*. 2006; 48(1): 1-7.
11. Yilmazlar S, Kocaeli H, Aksoy K. Quadrigeminal cisterna lipoma. *J Clin Neurosci* 2005; 12(5): 596-599.
12. Kawamata T, Aoki N, Sakai T, Takakura K. Congenital triventricular hydrocephalus associated with a small lipoma in the quadrigeminal plate cistern. *Child's Nerv Syst* 1995; 11(2): 121-123.
13. Ambrosetto P, Marinelli P, Bacci A, Daidone R. Lipoma of the quadrigeminal plate cistern. *Ital J Neurol Sci* 1985; 6(3): 347-349.
14. Haga HJ, Tomasen E, Johannesen A, Krakenes J. Neural compressive symptoms appearing during steroid treatment in a patient with intracranial lipoma. *Scand J Rheumatol* 1999; 28(3): 184-186.
15. Jiménez Caballero PE. Interhemispheric lipoma associated with agenesis of the corpus callosum. *Neurologia* 2012; 27(8): 515-517.
16. Bakshi F, Shaikh ZA, Kainram S, Kinkel PR. MRI findings in 32 consecutive lipomas using conventional and advanced sequences. *J Neuroimaging* 1999; 9(3): 134-140.
17. Pereira CU, Silveira ACA, Barreto AS, Britto AVO, Barbosa JAP. Lipoma intracraniano - Revisão da literatura. *Arq Bras Neurocir* 2013; 32(2): 98-104.
18. Borges RS, Brito CC, Carvalho GA, Domingues RC, Gasparetto EL. Cerebellopontine angle lipomas: Magnetic resonance imaging findings in two cases. *Arq Neuropsiquiatr* 2009; 67 (2B) 496-498.
19. Ogbole G, Zaganer I, Arias I. Quadrigeminal plate cistern lipoma. *BMJ Case Report*. 2009; doi:pil:bcr07.2009.2110.
20. Thakkar DK, Patil A, Thakkar D, Jantre MN, Kulkarni VM, Singh A. Quadrigeminal cistern lipoma: A rare case report with review of literature. *Med J Dr Y. Patil University*. 2015; 8(2): 267-270.
21. Jabot G, Stoquart-Elsankari S, Saliou G, Toussaint P, Deramond H, Lehmann P. Intracranial lipomas: Clinical appearances on neuroimaging and clinical significance. *J Neurol* 2009; 256(6): 851-855.
22. Satyam I, Mishra KK, Kohli S, Gupta V. Intracranial lipoma in quadrigeminal cistern. *IJBAR* 2014; 5(4): 220-222.
23. Hori A. Lipoma of the quadrigeminal region with evidence of congenital origin. *Arch Pathol Lab Med*. 1986; 110(9): 850-851.
24. Martínez-Lapiscina EH, García MP, Alegría MB. [Epileptic seizure and lipoma of corpus callosum: cause or incidental finding]. *Neurologia*. 2010; 25(5): 331-332.
25. Given CA, Fields TM, Pittman T. Interhemispheric lipoma connected to subcutaneous lipoma via lipomatous stalk. *Pediatr Radiol*. 2005; 35(11): 1110-1112.
26. Fitoz S, Atasoy C, Erden I, Akyar S. Intracranial lipoma with extracranial extension through foramen ovale in a patient with encephalocraniocutaneous lipomatosis syndrome. *Neuroradiology*. 2002; 44(2): 175-178.
27. Donati F, Vassella F, Kaiser G, Blumberg A. Intracranial lipomas. *Neuropediatrics*. 1992; 23(1): 32-38.
28. Budka H. Intracranial lipomatous hamartomas (intracranial "lipomas"): a study of 13 cases including combination with medulloblastoma, colloid and epidermoid cysts, angiomas and other malformations. *Acta Neuropathol* 1974; 28: 205-222.
29. Rethon AL. Microsurgical anatomy of the third ventricular region. In: Apuzzo MLJ: *Surgery of the Third Ventricle*. 2nd ed, Maryland, Williams e Wilkins, 1998. Cap 3, pp 89-157.

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