

Lipoma of the callosum corpus: A case report and literature review

Lipoma del cuerpo calloso: Reporte de caso y revisión de la literatura

José D. Charry MD MSc^{1,2,4}, Juan S. Calle-Toro MSc³, Sebastián Serrano MD⁴, Juan D. Areiza MD⁴, David R. Gutiérrez MD⁴, Laura D. Caquimbo MD⁴, Juan P. Solano MD MSc⁵, Camilo Calvache MD MSc⁵

¹ Research Department, Fundación Universitaria Navarra, UNINAVARRA, Neiva, Colombia.

² Universidad de Jaén, España.

³ Radiology División, Children's Hospital of Philadelphia, Philadelphia, USA.

⁴ Medicine Department, Universidad Surcolombiana, Neiva, Colombia.

⁵ Neurosurgery Department, Clínica Medilaser, Neiva, Colombia.

Abstract

Background: Intracranial Lipoma is a very rare congenital malformation, accounting for less than 0.1% of intracranial tumors; there are caused by the abnormal persistence of a focus of primitive meninges, an unclear form so far is induced to differentiate into adipocytes. **Case presentation:** This article reports the case of a 27-year-old woman who consulted the emergency department of a university hospital in Colombia for a long-standing clinical headache associated with a generalized clonic tonic episode and a normal neurological examination with a Computed Tomography (CT) scan that showed a hypodense lesion in the interhemispheric region, thus suspecting the lipoma of the corpus callosum (CC), which was confirmed by Nuclear Magnetic Resonance spectroscopy. Taking into account the location of the lesion and possible pathology, medical treatment was initiated, it was observed that the patient remained stable (symptomatic) during the 6 months of control. Next, the literature review on Lipoma of the corpus callosum. **Conclusions:** Lipoma of the corpus callosum is a rare benign disease, which the surgical management is infrequent and pharmacological control is favorable, as described in this case of a 27-year-old female diagnosed with this condition.

Key words: Intracranial tumors, Corpus callosum, Lipoma, case report.

Resumen

Introducción: El lipoma intracraneal es una malformación congénita muy rara, que representa menos del 0,1% de los tumores intracraneales; son causadas por la persistencia anormal de un foco de meninges primitivas, que de una forma poco clara hasta el momento, se induce a diferenciarse en adipocitos. **Presentación del caso:** Este artículo reporta el caso de una mujer de 27 años que consultó al servicio de urgencias de un Hospital Universitario de Colombia por clínica de cefalea de larga evolución asociada a un episodio tónico clónico generalizado. En la exploración neurológica no presentó signos de focalización o alteraciones, la tomografía computarizada (TC) evidenció una lesión hipodensa en la región interhemisférica, sospechando lipoma del cuerpo calloso (CC), que fue confirmado por espectroscopia de resonancia magnética nuclear (RMN). Teniendo en cuenta la ubicación de la lesión y posible patología, se inició tratamiento médico, se observó que la paciente permaneció estable durante los 6 meses de control. A continuación se realiza, la revisión de la literatura sobre Lipoma del cuerpo calloso. **Conclusiones:** El lipoma del cuerpo calloso es una enfermedad benigna rara, cuyo manejo quirúrgico es infrecuente y el control farmacológico es favorable, como se describe en este caso de una mujer de 27 años diagnosticada con esta patología.

Palabras clave: Tumores intracraneales, cuerpo calloso, lipoma, reporte de caso.

Correspondencia a:

Dr. José Daniel Charry
danielcharry06@gmail.com

Background

Intracranial lipoma is very rare congenital malformations, accounting for less than 0.1% of intracranial tumors¹; there are caused by the abnormal persistence of a focus of primitive meninges, not very clear until now, which is induced to differentiate into adipocytes^{2,3}. It is found at the level of the pia, arachnoid and dura mater³. Most of these injuries occur near the midline and often in the cerebral cisterns. Other locations include the quadrigeminal cistern, superior cerebellar peduncle, suprasellar cistern, cerebellopontine's angle cistern, and Sylvian cistern^{3,4}. Most lipomas of the corpus callosum are asymptomatic, although the most common symptom is the headache^{1,5}, depending on the extent and magnitude of the lesion.

Case presentation

It is about a 27 years old female patient, who consulted a university's hospital emergency department in Neiva, Colombia to present convulsive episode de novo, -with an antecedent of a long-standing a headache; admission neurological examination is normal and the paraclinical routine is within normal limits. A non-contrast computed tomography (CT) showed a slightly rounded hypodense lesion with irregular edges, located in the frontal midline supratentorial level and slight compression effect of adjacent parenchyma, no other injuries, basal cisterns were opened (Figure 1). The study is complemented with simple and contrasted cerebral magnetic resonance (MRI), which was performed with the medium contrast. A high intensified lesion in a sequence of T1 and T2 in supra-callosal midline was evidenced, predominantly in the right-side and surrounded by bilateral circumflex arteries, with no edema, the midline was preserved, cisterns were opened (Figures 2, 3 and 4). First, the presence of a lipoma of the corpus callosum was suspected, which was complemented by Spectroscopy NMR which showed a maximum peak of lipid-lactate, with decreased peak of NAA, Cho, and Cre, compatible with lesion of fat content and dysgenesis of the corpus callosum while the panangiography (Figure 5) and electroencephalogram of sleep were normal as reported in clinic record. It was decided to start treatment with anticonvulsants, finding the patient, 6 months later, asymptomatic and free of crisis.

Discussion

Intracranial lipoma is a very rare congenital malformation, accounting for less than 0.1% of intracranial tumors^{1,3,6}. Most of these lesions occur near the midline and often in the pericallosal cistern (> 50%); other locations include: The Cuadrigeminal cistern and the Ambiens cistern (20-25%), the superior cerebellar peduncle, the suprasellar cistern, Cistern angle of cerebellar (9%) and Cisterna Silviana (5%)^{3,4,6}. The first intracranial lipoma was described in 1818 by Meckel who found a Chiasmatal Lipoma; In 1856 Von Rokitansky described the first peri-callous lipoma which is associated with the agenesis of the corpus callosum^{3,5}, this condition is one of the

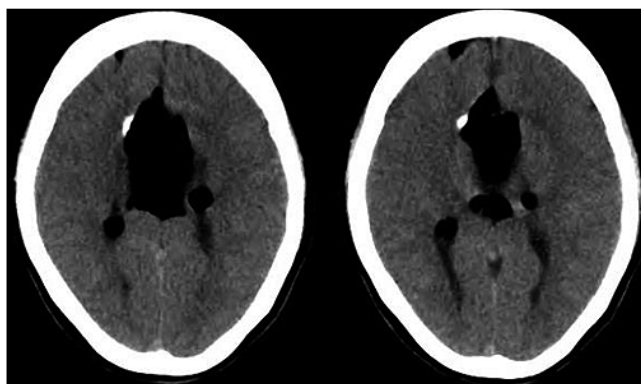


Figure 1. Computed tomography (CT) brain simply showing slightly rounded hypodense lesion, irregular edges, located in frontal midline supratentorial level, slight compression effect of adjacent parenchyma, no other injuries, open basal cisterns.

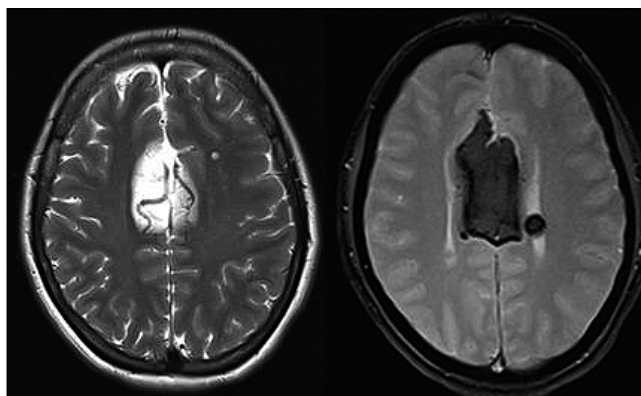


Figure 2. MRI brain axial section reports high intensity lesion sequence T1 and T2, which is performed with the dye and is in supracallosa midline predominance to right and surrounded by bilateral circumflex.

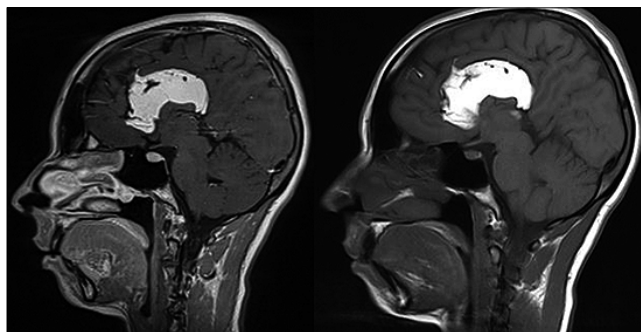


Figure 3. MRI brain, coronal section, reports high intensity lesion sequence T1 and T2, which is performed with the dye and is in supracallosa midline.

slow growing benign congenital malformations⁷ that normally appear between weeks 8 and 10 gestation^{5,6}, product of the abnormal persistence of a focus of primitive meninges that somehow tends to differentiate into adipocytes thus forming a lipoma^{3,7}; Interhemispheric lipomas are more common in the region of the corpus callosum up to 50% and correspond to 5% of tumor and non-tumoral malformations in that area.

The lipomas of the corpus callosum are morphologically

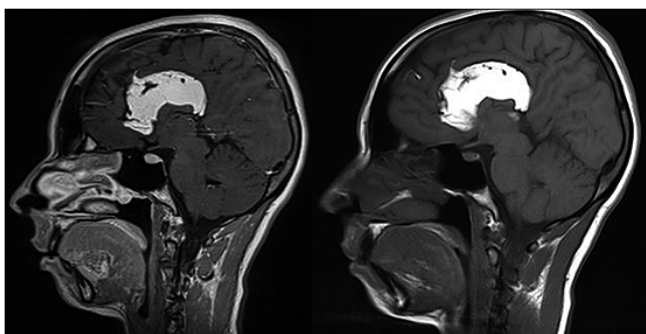


Figure 4. MRI brain, sagittal section, reports high intensity lesion sequence T1 and T2, which is performed with the dye and is in supracallosa midline, no edema, midline preserved, open tanks.

classified into two types: The lipoma located in the anterior region of the CC and tubule-nodular region, usually is larger than 2 cm, has a rounded or cylindrical shape, is related to hypogenesis or agenesis of the corpus callosum, can spread to the choroid plexus and lateral ventricles, as in the case discussed above; can also be associated with frontal lobe abnormalities, encephalocele, calcifications and/or ocular abnormalities. The posterior lipomas are curved, thin and rare located around the splenium, usually, less than 1 cm, is less related to the corpus callosum and other cerebral abnormalities^{1,5,6,7,8,9}. The association between hypogenesis and agenesis of the corpus callosum is common, occurring in 90% in the anterior lipoma and 30% in the posterior lipoma^{1,8}. Most lipomas are asymptomatic, but clinically it may be associated with seizures, long-standing headaches as presented in the above case, mental and motor disorders, epilepsy and cerebral palsy are usually associated with nerve tissue involvement^{1,5,8,9,10,16,17}, of which the most common is epilepsy, usually occurs before age 15, can also cause obstructive hydrocephalus^{5,8}. These symptoms are more frequent in women at a ratio of 1.25: 1 and in the pediatric age 70% appear in women^{5,10}.

At present, with the use of prenatal ultrasound control, it is more frequent to detect these cases from 26 weeks of gestation^{1,5,9,10,11}. The clinical diagnosis is made from the CT where the calcifications can be observed, mainly in the tubular-nodular variety^{1,5,6,7,8,9,10,11,12}, Magnetic resonance imaging is the test of choice not only for the characterization and extension of lipoma but also for the dysgenesis or agenesis of the corpus callosum; masses follow the signal intensity of fat in all sequences, appearing T1 and T2 with hyperintensity, however the fat suppression sequence FAT-SAT allows identify fat suppression sequence⁵⁻⁷. These two imaging techniques were performed in the exposed case^{13,14,15}.

In the case of convulsions, the use of an electroencephalogram may reveal an epileptic focus associated with Lipoma of the callosum body, although in the presented case nothing relevant was found. There are few differential diagnoses, including dermoid cysts and teratoma¹⁵. For the treatment of such anomalies, surgical procedures are not recommended, except when there is a hydrocephalus⁵⁻⁷, the reasons are due to the high vascularity, adhesion and infiltration of the capsule to the adjacent tissues, their null growth^{1,3,5,7,8,9,10,11,12,14}, most of the literature reviews recommend symptomatic treatment with



Figure 5. Report pan angiography found vascular structures without anomaly and nonvascular impregnating tumor evidence callosum.

anticonvulsants in patients with epilepsy such as the patient treated in the case exposed, anti-migraine prophylaxis and multidisciplinary stimulation in patients with Maturation delay

Learning points

- According to its morphology and location, two types of lipomas can be found in the corpus callosum: lipoma located anterior (tubule-nodular) and posterior lipoma.
- The anterior lipoma (tubule-nodular) is more related to anomalies such as hypogenesis or agenesis of the corpus callosum.
- Although most of these lipomas are asymptomatic, they may be associated with seizures, long-lasting headaches, mental or motor disorders, epilepsy and cerebral palsy.
- The use of diagnostic aids such as electroencephalogram may favor clinical suspicion.

Conclusions

Lipoma of the corpus callosum is a rare benign disease, which the surgical management is infrequent and pharmacological control is favorable, as described in this case of a 27-year-old female diagnosed with this condition.

Declarations

Ethics approval and consent to participate:

Not applicable

Consent for publication:

Written informed consent was obtained from the patient for publication of this case report. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Availability of data and material:

Not applicable

Competing interests

The authors declare that they have no competing interests

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Acknowledgements

Not applicable

References

1. Tagliatela G, Galasso R, Tagliatela G, Conforti R, Volpe A, Galasso L. Lipomas of corpus callosum. *Neuroanatomy*. 2009;8:39-42.
2. Britt PM, Bindal AK, Balko MG, Yeh HS. Lipoma of the cerebral cortex: case report. *Acta Neurochir (Wien)* 1993;121:88-92.
3. Truwit CL, Barkovich AJ. Pathogenesis of intracranial lipoma: an MR study in 42 patients. *AJR Am J Roentgenol*. 1990;155(4):855-64.
4. Cherian A, Baheti N, Menon R, Iyer R. Hemispheric intracranial lipoma with seizure: look under the carpet. *Neurol India*. 2011; doi:10.4103/0028-3886.76865.
5. Loddenkemper T, Morris H, Diehl B, Lachhwani D. Intracranial lipomas and epilepsy. *J Neurol*. 2006;253(5):590-3.
6. Fuga M, Tanaka T, Yamamoto Y, Hasegawa Y, Murayama Y, Takahashi-Fujigasaki J. Lipoma in the Corpus Callosum Presenting with Epileptic Seizures Associated with Expanding Perifocal Edema: A Case Report and Literature Review. *Case Rep Neurol Med*. 2015; doi:10.1155/2015/520208.
7. Friedman RB, Segal R, Latchaw RE. Computerized tomographic and magnetic resonance imaging of intracranial lipoma. *J Neurosurg*. 1986;65(3):407-10.
8. Yildiz H, Hakyemez B, Koroglu M, Yesildag A, Baykal B. (2006). Intracranial lipomas: importance of localization. *Neuroradiology*. 2006;48(1):1-7.
9. Moscote-Salazar LR, Castellar-Leones SM, Gutiérrez-Paternina JJ, Alcalá-Cerra G, Escorcía HF. Lipoma de cuerpo calloso y quiste epidermoide: una inusual asociación. *Rev Chil Neurocirugía*, 2013;39:78-80.
10. Zhari B, Mattiche H, Boumdine H, Amil T, Ennouali H. Lipoma of the corpus callosum: about a case with literature review. *Pan Afr Med J*. 2015; doi:10.11604/pamj.2015.21.245.4069.
11. AlJallaf M, AlJanahi S, AlJanabi T. Lipoma of the corpus callosum. *BMJ Case Rep*. 2015; doi: 10.1136/bcr-2014-209176.
12. Yilmaz MB, Egemen E, Tekiner A. Lipoma of the quadrigeminal cistern: report of 12 cases with clinical and radiological features. *Turkish Neurosurg*. 2015; doi:10.5137/1019-5149.JTN.8694-13.1.
13. Rajan DS, Popescu A. Corpus callosum lipoma. *Neurology*. 2012; doi:10.1212/WNL.0b013e318251838b.
14. Yilmaz MB, Genc A, Egemen E, Yilmaz S, Tekiner A. Pericallosal Lipomas: A Series of 10 Cases with Clinical and Radiological Features. *Turk Neurosurg*. 2016; doi:10.5137/1019-5149.JTN.13008-14.0.
15. Ventura E, Ormitti F, Crisi G, Sanna M, Bacciu A. Bilateral cerebellopontine angle lipomas. *Auris Nasus Larynx*. 2012; doi:10.1016/j.anl.2011.01.021.
16. Elhend SB, Belfquih H, Hammoune N, Athmane EM, Mouhsine A. Lipoma With Agenesis of Corpus Callosum: 2 Case Reports and Literature Review. *World Neurosurg*. 2019;125:123-125.
17. Wang LM, Zhang M, Wang PP, Wei LF, Piao YS, Li Chen et al. Interhemispheric Cistern Lipoma Associated With Malformations of Cortical Development, Hypogenesis of the Corpus Callosum, and Abnormal Vasculature. *Chin Med J* 2019 (Disponible es: https://pubmed.ncbi.nlm.nih.gov/31855957/?from_term=lipoma+corpus+callosum&from_filter=ds1.y_1&from_pos=1).