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Sellar angiolipomas: 2 case reports and review of the literature

Danijela Kolenc, MD[1], Kamelija Žarković, MD, PhD[1], Hrvoje Jednačak, MD[2], David Ozretić, MD[3], and Mario Habek, MD[4]

From the:
[1]University Department of Neuropathology, Zagreb School of Medicine and University Hospital Center, Zagreb, Croatia
[2]University Department of Neurosurgery, Zagreb School of Medicine and University Hospital Center, Zagreb, Croatia
[3]University Department of Neurology, Zagreb School of Medicine and University Hospital Center, Zagreb, Croatia
[4]University Department of Neurology, Zagreb School of Medicine and University Hospital Center, Zagreb, Croatia

Corresponding author:

Mario Habek, MD
University Department of Neurology
Zagreb School of Medicine and University Hospital Center
Kišpatićeva 12
HR-10000 Zagreb
Croatia
Phone: +38598883323; Fax: +38512388045; e-mail: mhabek@mef.hr

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Summary

Angiolipomas are mesenchymal hamartomas composed of abnormal blood vessels and mature adipose tissue, most commonly found in the subcutaneous tissue of the extremities. Intracranial location is extremely rare and only five cases have been described in the sellar region. We report on two patients that were initially diagnosed with pituitary adenomas that were postoperatively verified as angiolipomas. Sellar angiolipomas should be considered on the differential diagnosis of pituitary lesions due to the potential catastrophic bleeding during surgery. Preoperative diagnosis is very difficult; however, some MRI characteristics can help make an accurate diagnosis. Adequate MRI sequences should be used in the evaluation of pituitary lesions, as they can help optimize the microsurgical management.

Key words: pituitary, angiolipoma, sellar region, differential diagnosis

Introduction

The most frequent pathology of pituitary gland is pituitary adenoma. However, with the introduction of magnetic resonance imaging (MRI), a broad range of intrasellar and perisellar lesions have been identified that can mimic this condition [1]. These include hemorrhage or infarction of the pituitary, lymphocytic hypophysitis, craniopharyngioma, Rathke's cleft cyst and meningioma. We report on two patients initially diagnosed with pituitary adenomas that were postoperatively found to be angiolipomas.

Patients and Methods

Patients

Case 1. A 51-year-old female patient underwent brain and lumbar spinal cord MRI because of headaches and lower back pain for a couple of years. Brain MRI revealed a tumor (2.5x1.5 cm in diameter) in the right cavernous sinus and right half of the sella turcica, which was hyperintense on T2 weighted and isointense on T1 weighted sequences, with minimal enhancement upon gadolinium application (Figure 1 a,b,c). The tumor compressed pituitary gland and infundibulum to the left as well as amygdala on the right. Differential diagnosis of this tumor included schwannoma, meningioma, granulomatous inflammation or pituitary macroadenoma. For further work-up she was admitted to endocrinology department. She had normal physical and neurological findings. Standard laboratory test, ECG and chest X-ray were normal. Stimulation tests (TRH, ITT) showed normal functional reserve of thyrotropic, somatotropic and corticotropic pituitary cells, and normal menstrual cycle indirectly pointed to the normal gonadotropic function. Control MRI showed no change.

Neurosurgeon performed tumor ablation with transsphenoid approach. The operation was stopped upon resection of only a small part of tumor tissue because of hemorrhage that occurred during the procedure. Postoperative period proceeded without complications. A couple of months later the patient was treated with gamma knife surgery and on control follow up she had no new symptoms and MRI revealed shrinkage of the tumor.

Case 2. A 62-year-old male patient with a history of hypertension and hypercholesterolemia developed double vision and headache. Emergency CT scan revealed a tumor process of the pituitary gland and the patient was scheduled for brain MRI, which revealed intrasellar tumor process with expansion to the left cavernous sinus and left medial parahippocampal gyrus. The tumor had a capsule and showed no signs of infiltration. Upon gadolinium enhancement, the tumor showed inhomogeneous enhancement and signs of microhemorrhages (Figures 1d,e,f). During hospital stay, he developed progressive visual loss and emergency brain MRI revealed bilateral occipital lobe infarctions due to partial thrombosis of the basilar artery. The patient was transferred to neurology department. He recovered well, and control multi-sliced CT angiography revealed stenosis at the beginning of basilar artery and normal posterior cerebral arteries. Two months later, he was admitted to endocrinology department because preoperative work-up revealed normal hormonal status. A neurosurgeon performed tumor ablation with transsphenoid approach. Again, the surgery was complicated with bleeding and had to be completed before total lesion removal. Postoperative period proceeded uneventfully.

Control MRI obtained six months later revealed residual tumor which occupied left cavernous sinus with present post-gadolinium enhancement. The patient underwent gamma-knife operation, however, he was lost to further follow-up.

Methods

Paraffin embedded tumors of both patients were examined by section staining with hematoxylin and eosin and with Mallory, and immunohistochemistry method with factor VIII (DAKO, 1:40), CD 34 (DAKO, 1:40), actin (DAKO, 1:50), desmin (DAKO, 1:50) and vimentin (DAKO, 1:100). Dilutions of antibody solution and appropriate reagents from the LSAB detection kit (DAKO) were used on a DAKO automated immunostainer. Antigens were localized using an avidin-biotin method with 3,3'-diaminobenzidine as a chromogen. Each set of slides used for immunohistochemical study were accompanied by control sections known to contain cells positive for the examined antigen.

Results

Grossly, the tumors measured 0.9 cm (Patient 1) and 3.2 cm (Patient 2) in largest diameter, and were tan-gray to brown with a soft consistency. Light microscopy revealed vascular tumors composed of dilated capillaries and cavernous vessels and mature adipose tissue (Figure 2 a,b,c). These capillaries focally contained small fibrin thrombi. Vessels were occasionally composed of only a flattened single layer of endothelial cells (sore vessels), and others showed a few layers of smooth muscle cells. The interstitium consisted of mature adipose tissue and collagenous stroma with inflammatory infiltrate consisting predominantly of lymphocytes and plasma cells. Immunohistochemistry

revealed strong reaction for vimentin (Figure 2 d) and actin in smooth muscle cells and some endothelial cells. Smooth muscle cells were not positive for desmin. The endothelial cells showed diffuse cytoplasmic staining with antibodies against factor VIII (Figure 2 e) and CD34 (Figure 2 f).

Discussion

Angiolipomas are mesenchymal hamartomas composed of abnormal blood vessels and mature adipose tissue. They are most commonly found in the subcutaneous tissue of the extremities. These tumors are extremely rarely located in the central nervous system (CNS). In a recent literature review, Andaluz *et al.* identified 94 cases of angiolipomas of the CNS, of which 86 were spinal cord tumors [2]. The authors raise the question of rareness of these tumors in the spinal cord region and suggest clinical and MRI characteristics that should point to an accurate diagnosis. Of the eight intracranial angiolipomas, three were identified in the sellar or parasellar region [3-5]. We identified two more cases of parasellar angiolipomas in the literature [6-7]. In all those five cases as well as in our two patients, the diagnosis was made after the surgery. In such cases, operative complications are quite common and include profuse bleeding and an unusual relationship between the lesion and cavernous sinus, making complete removal rarely possible [6]. It also proved true in our patients, when surgeries had to be terminated due to hemorrhage. In addition, control MRI in patient 2 revealed residual tumor in the cavernous sinus. Gamma-knife surgery is a treatment option in such cases; unfortunately, this patient was lost to follow-up and postoperative MRI was not available.

Based on the literature reports and our two cases, we could not identify any clinical symptoms or signs that would be suggestive of angiolipomas in the sellar region. These tumors are usually slow-growing, hormonally inactive, may be asymptomatic, but sudden neurological deterioration may occur. However, all these findings can also be present in all other pituitary lesions.

On MRI, these tumors are usually iso- or hyperintense on T1 weighted sequences and hyperintense on T2 weighted sequences, with postgadolinium enhancement on T1 weighted sequences [8]. They often show microhemorrhages, which were present in our patient 2, a finding strongly suggestive of this tumor. Since they contain fat, they are often hard to delineate from epidural fat tissue, and in such cases fat suppression sequences can be very useful.

In conclusion, parasellar angiolipomas are extremely rare tumors, but they should be considered on the differential diagnosis of pituitary lesions because of the potential catastrophic intraoperative hemorrhage. Preoperative diagnosis is very difficult; however, some MRI characteristics can help make an accurate diagnosis. Fat suppression sequences should be routinely performed in all pituitary lesions, as these sequences can help optimize microsurgical management.

References

1. Levy A. Pituitary disease: presentation, diagnosis, and management. J Neurol Neurosurg Psychiatry 2004;75 Suppl 3:iii47-52.
2. Andaluz N, Balko G, Bui H, Zuccarello M. Angiolipomas of the central nervous system. J Neurooncol 2000;49:219-30.
3. Takeuchi J, Handa H, Keyaki A, Haibara H, Ozaki S. Intracranial angiolipoma. Surg Neurol 1981;15:110-3.
4. Wilkins PR, Hoddinott C, Hourihan MD, Davies KG, Sebugwawo S, Weeks RD. Intracranial angiolipoma. J Neurol Neurosurg Psychiatry 1987;50:1057-9.
5. Lach B, Lesiuk H. Intracranial suprasellar angiolipoma: ultrastructural and immunohistochemical features. Neurosurgery 1994;34:163-7.
6. Pirotte B, Krischek B, Levivier M, Bolyn S, Brucher JM, Brotchi J. Diagnostic and microsurgical presentation of intracranial angiolipomas. Case report and review of the literature. J Neurosurg 1998;88:129-32.
7. Shuangshoti S, Wangsuphachart S. Angiolipoma of suprasellar region. J Med Assoc Thai 1995;78:631-4.
8. Weill A, del Carpio-O'Donovan R, Tampieri D, Melanson D, Ethier R. Spinal angiolipomas: CT and MR aspects. J Comput Assist Tomogr 1991;15:83-5.

Figures

Figure 1. MRI findings: Patient 1: A) T1 coronal image, B) T2 coronal image, C) T1 post-gadolinium coronal image: the tumor is seen in the central and right aspect of the sella and cavernous sinus area; the normal pituitary gland and infundibulum are displaced into the far left sella. Patient 2: A) T1 coronal image, B) T2 coronal image, C) T1 post-gadolinium coronal image: the intrasellar tumor process with expansion to the left cavernous sinus and left medial parahippocampal gyrus is seen. Upon gadolinium enhancement, the tumor showed inhomogeneous enhancement and signs of microhemorrhages.

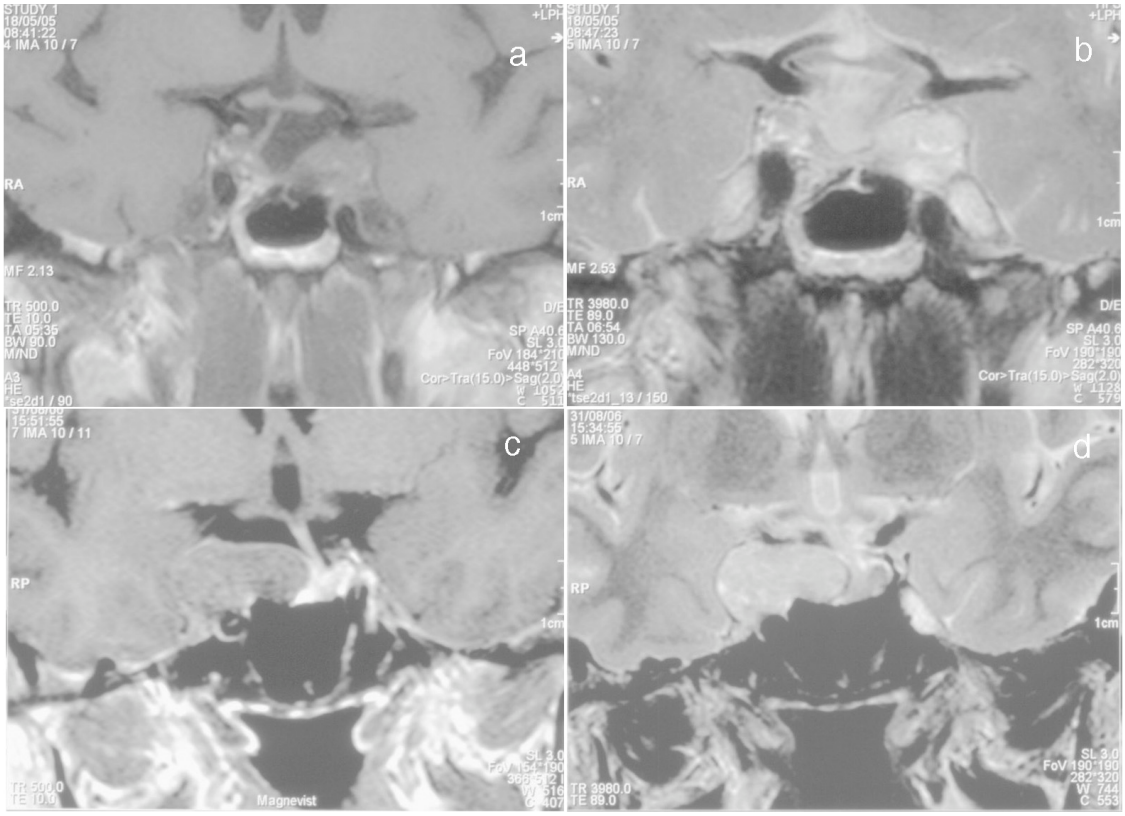

Figure 2. Histopathologic findings: (A) hematoxylin-eosin, X40x; (B) hematoxylin-eosin, stained, X100; (C) hematoxylin-eosin, X200; (D) strong reaction for vimentin; (E) diffuse positive staining of endothelial cells with factor VIII; (F) flattened endothelial cells immunoreactive for CD34.