SURGICAL RESECTION OF A DOPAMINE AGONIST-RESISTANT MACROPROLACTINOMA: A CASE REPORT

Ressecção Cirúrgica de Macroprolactinoma Resistente a Agonista Dopaminérgico: Estudo de Caso

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ABSTRACT

Prolactin-secreting pituitary tumors account for approximately 50% of all pituitary adenomas, of which 10% are macroadenomas. A 63-year-old woman reported a decrease in visual acuity for about six months and sporadic headaches. The patient was evaluated by endocrinology due to hyperprolactinemia and underwent magnetic resonance imaging (MRI) that identified an expansive formation of pituitary tissue, suggesting a pituitary adenoma. The treatment was performed with oral cabergoline without control of hyperprolactinemia. A control MRI showed tumor enlargement, leading to surgical resection of the pituitary tumor via a transnasal transsphenoidal approach. Macroprolactinomas are prolactin-secreting tumors with clinical first-line treatment using dopaminergic agonists. Surgical resection is rare and is reserved for cases refractory to medical therapy.

Keywords: Adenoma; Neurosurgery pituitary diseases; Pituitary gland; Pituitary neoplasms.

RESUMO

Os tumores hipofisários secretores de prolactina compreendem cerca de 50% de todos os adenomas hipofisários, dentre os quais apenas 10% são macroadenomas. Paciente do sexo feminino, 63 anos, referia diminuição da acuidade visual havia cerca de 06 meses e cefaleia esporádica. Foi avaliada pela endocrinologia devido à hiperprolactinemia, tendo sido submetida a exame de imagem que detectou a presença de formação expansiva ocupando tecido hipofisário, sugestivo de adenoma hipofisário. Foi então tratada com cabergolina oral, sem controle da hiperprolactinemia. A ressonância magnética de controle, feita havia seis meses, revelou aumento nas dimensões do adenoma, e a paciente foi submetida a tratamento cirúrgico de ressecção do tumor hipofisário por via transnasal-transfenoidal. Os macroprolactinomas são tumores secretores de prolactina, cujo tratamento de primeira escolha é clínico, com agonistas dopaminérgicos. O tratamento de ressecção cirúrgica é raro e indicado para os casos que não respondem ao tratamento clínico.

Palavras-chave: Hipófise; Adenoma; Doenças da hipófise; Neoplasias hipofisárias; Neurocirurgia.

INTRODUCTION

Pituitary adenomas are common intracranial tumors. Although mostly benign, they cause clinical symptoms due to the overproduction or deficiency of hormones and tumor mass[1].

Pituitary adenomas are classified as microadenomas (< 10 mm), macroadenomas (≥ 10 mm), and giant adenomas (≥ 40 mm)[2,3]. Approximately two-thirds of these tumors release an excess of hormones[4].

Prolactin-secreting pituitary tumors, or prolactinomas, are more frequent in women aged 20 to 50 years and comprise 50% of all pituitary adenomas. However, only 10% of prolactinomas are macroadenomas[4].

Clinical treatment is the first-line approach for hyperprolactinemia, including tumors, with a success rate of up to 90% and tumor reduction of 60%. Surgery is reserved for cases refractory to medical therapy[5].

This study aimed to present a case report on the surgical resection of a dopamine agonist-resistant macroprolactinoma.

CASE REPORT

This ethics committee for research involving human beings of the Olinda School of Medicine (FMO) approved this case report under the number 4646864.

A 63-year-old woman reported an undefined decrease in visual acuity and difficulty in reading and watching television that started six months ago. In addition, the patient reported sporadic headaches.

An endocrinologist evaluated the patient two years earlier for hyperprolactinemia. Brain magnetic resonance imaging (MRI) showed an expansive formation on the pituitary tissue, suggesting a pituitary adenoma. The patient was treated with oral cabergoline without hyperprolactinemia control.

After 18 months of the diagnosis, a control MRI showed growth of the pituitary adenoma. The expansive formation measured 2.1 x 2.0 x 1.6 cm, occupying almost all pituitary tissue and extended into the suprasellar cistern, causing cranial displacement of the optic chiasm. A slight lateral bulging was evidenced, shifting the internal carotid arteries near the origin of the middle cerebral arteries without vascular involvement. Additionally, a lowering of the sellar floor was observed without signs of erosion or bone destruction. The diagnosis was of a pituitary lesion suggestive of pituitary macroadenoma (Figure 1).

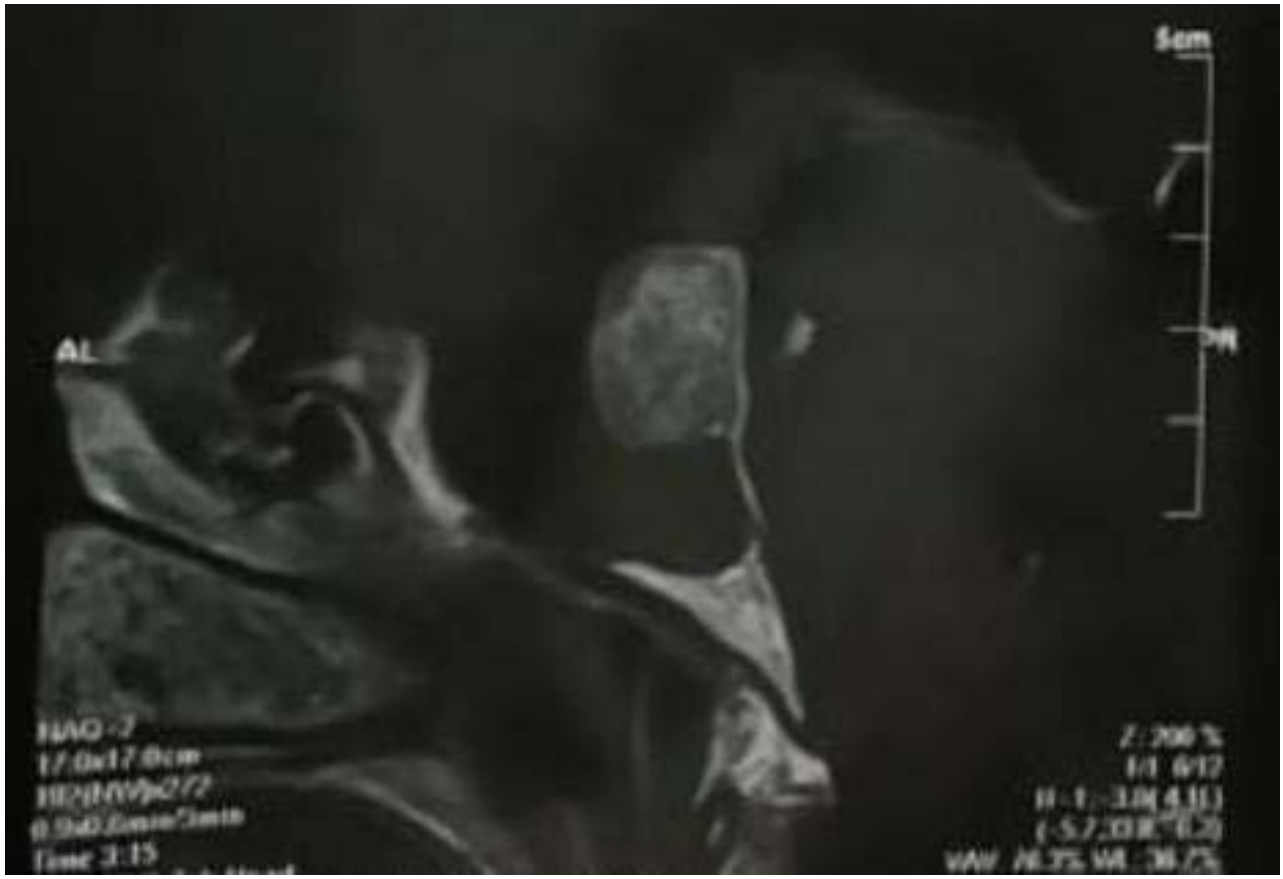

Figure 1. MRI of the sella turcica with contrast, sagittal section, demonstrating expansive formation measuring approximately 2.1 x 2.0 x 1.6 cm, suggestive of macroadenoma.

The patient underwent a visual campimetry exam, which showed bilateral heteronymous hemianopsia. A neurologic exam confirmed the visual field alteration, characterized by the bitemporal heteronymous hemianopsia, evidenced in the visual campimetry. Other noteworthy alterations were not observed.

The patient underwent endoscopy-guided transnasal transsphenoidal surgery for pituitary tumor resection, with no surgical complications. In the early postoperative period, hemianopsia regressed, and prolactin levels normalized. Postoperative MRI did not show evidence of the tumor, with preserved pituitary parenchyma and postsurgical scar changes (Figure 2).

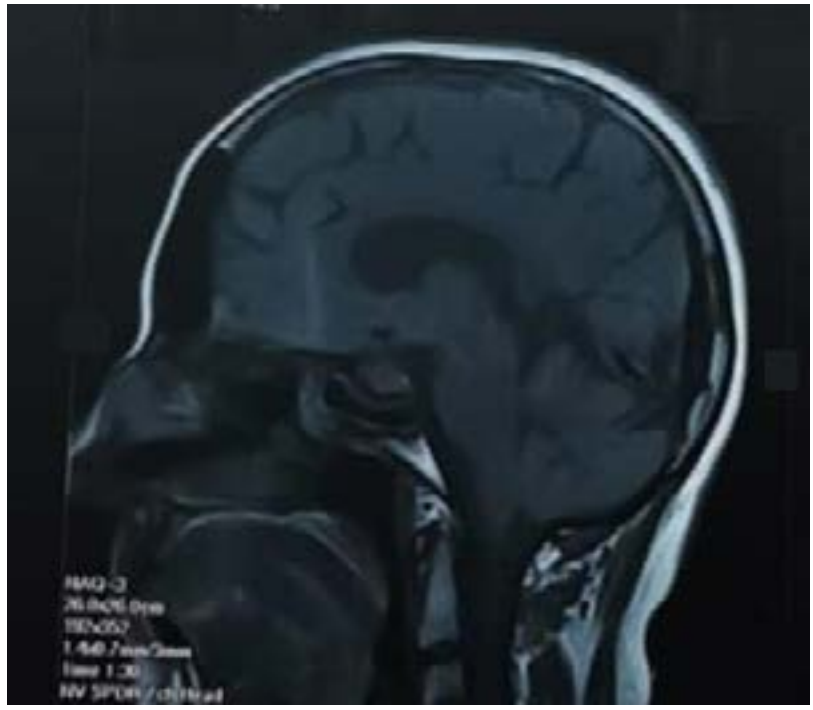

Figure 2. Brain MRI in a sagittal section, showing pituitary parenchyma preserved and postsurgical scar changes.

DISCUSSION

High prolactin levels inhibit the hypothalamic-pituitary axis, resulting in libido loss, infertility, and osteoporosis in both sexes; oligomenorrhea, amenorrhea, and galactorrhea in women; and erectile dysfunction in men[6-8].

Prolactinomas are among the most common causes of hyperprolactinemia, typically increasing plasma prolactin levels beyond 50 µg/mL. Therefore, a brain and sella turcica assessment should be conducted via imaging exams in a suspected prolactinoma or with increased levels of prolactin[5].

More than 90% of the prolactinomas are microadenomas[9]. The MRI exam determines the presence and size of a tumor. However, when the tumor is not observed, hyperprolactinemia is classified as idiopathic. Additionally, a non-secreting macroadenoma may elevate prolactin levels due to its secretion inhibition, compressing the pituitary stalk or the hypothalamus. A prolactin level superior to 200 µg/L is generally related to prolactinoma production rather than pituitary stalk compression[10]. In the presence of a large tumor (> 3 cm), the extremely increased prolactin levels (> 10000 µg/L) rarely saturate assay antibodies, leading to false low or normal values ("hook effect"). Prolactin levels should be reassessed using a 1:100 dilution to avoid misinterpretation[7,8].

The treatment aims to restore normal gonadal function and fertility and reduce tumor size in patients with macroadenomas[7, 8]. Patients with mild eugonadal symptoms (e.g., women with mild galactorrhea and regular menstruation) and normal or with microadenomas in MRI might follow with observation, monitoring prolactin levels every 6 to 12 months.

When prolactinemia increases or symptoms develop due to hyperprolactinemia, a follow-up MRI should be performed to assess tumor size and initiate treatment. Only 5% to 10% of the microprolactinomas grow throughout 10 years[6]. Women with oligomenorrhea or amenorrhea who do not wish to conceive may use oral contraceptives or estrogen-progestin therapies as treatment options[7, 8].

The clinical treatment for prolactinomas is performed with dopamine agonists that activate dopamine receptors in the tumor. Considering its high efficacy and tolerability, cabergoline is more effective than bromocriptine in normalizing prolactin levels and reducing tumor size, with lower adverse effects[6-8]. However, 15% to 20% of patients, especially those with macroadenomas, may require larger doses

than conventional to ensure control[11,12].

Although a three- to six-fold increased risk of cardiac valve abnormalities was observed in patients with Parkinson's disease who received high doses of cabergoline for more than six months[13], this adverse effect was not demonstrated in patients with prolactinomas treated with conventional doses14. Since the threshold for risk of valve abnormalities is unknown, annual echocardiograms are recommended for patients exceeding the weekly dose of two milligrams[15]. Additionally, dopamine agonists may induce compulsive behaviors (e.g., excessive gaming, hypersexuality) in approximately 5% of patients, and they should be warned of this adverse effect[4].

Transsphenoidal surgery is a therapeutic option and may achieve prolactin normalization in 65% to 85% of microadenoma and in 30% to 40% of macroadenoma cases, with a recurrence rate of 20% in 10 years[6]. Radiotherapy is reserved for rare cases (< 5%) of hyperprolactinemia and uncontrolled tumor growth despite dopamine agonists or surgery[7, 8]. In aggressive prolactinomas and pituitary carcinomas, the alkylating agent temozolomide has been used with limited success[15].

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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