Macroprolactinoma in a 14-Year-Old Girl in the Northeast of Iran: A Case Report

Macroprolactinoma em uma garota de 14 anos no nordeste do Irã: Relato de caso

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Arq Bras Neurocir 2024;43(1):e73–e75.

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Abstract

Prolactinoma is frequently found not only in females but also in males with abnormal reproductive and/or sexual function. Patients typically complain about amenorrhea and infertility because of anovulation. Approximately 15% to 20% of cases of secondary amenorrhea are caused by prolactinemia. Galactorrhea may occur simultaneously, before or after menstrual disorders, and sometimes it may not be clinically obvious, or only detected by breast examination. We reported a case of a 14-year-old girl who presented primary amenorrhea accompanied by frequent headaches and blurred vision. Hormonal tests showed severe hyperprolactinemia (prolactin [PRL] concentration: 1,570 ng/ml). Further tests confirmed a mass in the pituitary with an extension to the left parasellar and suprasellar regions. Some parts of the sella turcica tumor were removed by transcranial surgery. During the follow-up, the clinicopathological examinations revealed the patient had hyperprolactinemia. Clinicians should be aware of the diagnostic and therapeutic problems regarding the management of hyperprolactinemia.

Keywords

- macroadenoma
- prolactinoma
- pituitary
- amenorrhea
- sella turcica

Resumo

O prolactinoma é frequentemente encontrado não apenas em mulheres, mas também em homens com funç ão reprodutiva e/ou sexual anormal. Os pacientes geralmente se queixam de amenorreia e infertilidade devido à anovulaç ão. Aproximadamente 15% a 20% dos casos de amenorreia secundária são causados por prolactinoma. A galactorreia pode ocorrer simultaneamente, antes ou depois dos distúrbios menstruais, e às vezes pode não ser clinicamente óbvia ou ser detectada apenas pelo exame das mamas. Relatamos o caso de uma menina de 14 anos que apresentou amenorreia primária acompanhada de dores de cabeça frequentes e visão turva. Os testes hormonais mostraram hiperprolactinemia grave (concentraç ão de prolactina [PRL]: 1.570 ng/ml).Outros exames confirmaram uma massa na hipófise com extensão para as regiões parasselar e suprasselar esquerda. Algumas partes do tumor da sela turca foram removidas por cirurgia transcraniana. Durante o acompanhamento, os exames clinicopatológicos revelaram que o paciente apresentava hiperprolactinemia. Os médicos devem estar cientes dos problemas diagnósticos e terapêuticos relativos ao manejo da hiperprolactinemia.

Palavras-chave

- macroadenoma
- prolactinoma
- hipófise
- amenorreia
- sela turca

received
July 6, 2020
accepted
March 9, 2021

DOI https://doi.org/10.1055/s-0043-1776700.
ISSN 0103-5355.

Thieme Revinter Publicações Ltda., Rua do Matoso 170, Rio de Janeiro, RJ, CEP 20270-135, Brazil

Introduction

Pituitary adenomas are the most common type of tumors of the sella turcica region. Prolactinoma is the most common type of pituitary adenoma, leading to the hyper-/hyposecretion of hormonal syndromes and second amenorrhea.[1] Among the cases of prolactinoma, microprolactinoma and macroprolactinoma are common in female and males respectively.[2] Beyond the reason of prolactinoma, all the patients have similar clinical manifestations. Compared with male patients, who complain about erectile dysfunction, female patients complain about irregular menstrual cycles and infertility. Prolactin (PRL) secretion may be altered by different factors, such as physiological and pathological conditions, and the use of certain drugs.[3] However, the upper threshold for serum PRL in women is 25 ng/ml. The clinical manifestation of amenorrhea-galactorrhea syndrome is influenced by the concentrations of serum PRL. In the classic forms of hyperprolactinemia, the concentrations of serum PRL are $>$ 100 ng/ml.[4] In the current study, we report the case of a girl with prolactinoma who had not been correctly diagnosed in the past to focus more on the clinical manifestations and efficient diagnostic methods.

Case Report

A 14-year-old girl was referred to the endocrinologist at North Khorasan University of Medical Sciences with primary amenorrhea. She also had a positive history of chronic headaches and blurred vision that had started three years before, which was suspected to be related to sinusitis. Physical examinations based on Tanner staging showed the breast and pubic hair area in the second stage without any progress during the three years until she was referred to our institution. Preoperative examinations using a radioimmunoassay and electrochemiluminescence revealed that the levels of serum PRLn and cortisol were of 1,570 ng/ml and 23 Iu/ml respectively. Moreover, the other pituitary and thyroid hormones such as the thyroid-stimulating hormone (TSH), free T4, cortisol and insulin-like growth factor type 1 (IGF-1) were within normal limits. Computed tomography (CT) scans of the pituitary cavity revealed a mass (measuring 32 cm x 24 cm) with an extension to the left parasellar and suprasellar regions. Additionally, magnetic resonance imaging (MRI) scans of the region of the sella turcica revealed the same mass with suprasellar extension and pressure on the cavernous sinus (►**Figure 1**). Basedon these findings, the patient was diagnosed with prolactinoma. A perimetric examination also showed an external visual disorder in the left eye. Although the medical treatment with dopamine agonists is widely established as the first line of treatment for hyperprolactinemia, our case was submitted to the transcranial surgery because of her personal tendency as well as the high size of the tumor. Nevertheless, the mass was not completely eliminated. A pathological examination showed neoplastic tissue involving proliferative and hyperchromic cells, which were a pituitary adenoma with positive CK and synaptophysin, as well as negative GFAP, LCA, EMA, CD99, and S100. Regarding the reduction in the levels of other pituitary hormones after the surgery, the patient was followed up to assess her pituitary function. Postoperative examinations revealed thyroidism, hypogonadism, and a reduction in serum cortisol. Although the concentrations of serum prolactin had a declining trend after the surgery, they were still high enough to show that the tumor mass had not been completely removed. Consequently, 25 radiotherapy sessions were scheduled to completely eliminate the tumor tissue. Currently, the patient is still taking medications regularly and attending check-ups.

Discussion

Prolactinoma is one of the several tumors that can be observed in the pituitary gland, and it can be treated by regular drug therapy.[5] Moreover, the patients may not have any clear clinical manifestations until the progression of the tumor to the local tissues. In such stages, pressure of the tumor on the

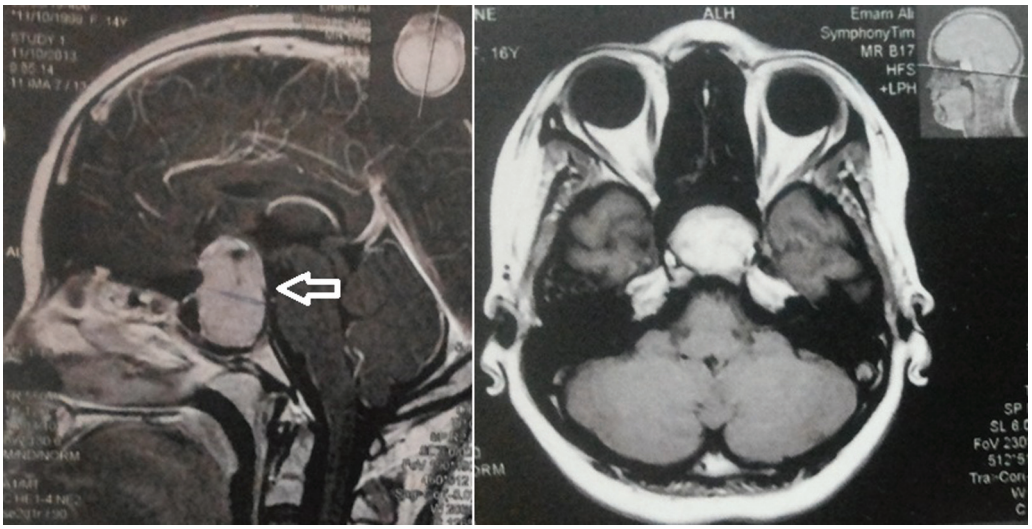

Fig. 1 Magnetic resonance imaging (MRI) scan showing a giant adenoma (white arrow).

local tissues results in chronic headaches, visual impairment, and hypothyroidism.[6] In the current report, we observed primary amenorrhea, blurred vision, and chronic headaches. Nevertheless, clinicians should be aware of the diagnostic errors in the case of high concentrations of PRL, called "high dose hook effect." In this condition, very high concentrations of PRL can lead to abnormal results by saturating all of the immunoglobulin used in the assay.[7]

Fertility and the function of the gonads are reversible in most of the patients with the use of dopamine agonists, bromocriptine, and cabergoline. However, transsphenoidal surgery is required for the cases with blurred vision, neurologic issues, and low drug tolerance. Moreover, if the transsphenoidal surgery is not possible due to the size of the tumor, transcranial surgery should be performed to eliminate the bulk of the tumor. Radiotherapy is also the best treatment option in the case of patients unresponsive to the drug treatment or when complete tumor resection is impossible.[8]

In conclusion, the prepubertal diagnosis of prolactinoma is really important in the cases with delayed puberty. Although in the current case puberty started on time, we haven't observed a normal progress of it in referring time. Therefore, the primary assessment of amenorrhea is required in the cases without secondary sexual features, such as thelarche and adrenarche, to avoid more complications.

Authorship

Habibe Sadat Shakeri and Alireza Monemi participated in the conception, design, and interpretation of data; Samaneh Mollazadeh drafted the manuscript; the final version of the manuscript was approved by all authors.

Ethical Approval

All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional and/or national research committees and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate

Informed consent was obtained from the patient included in the study.

Funding

The authors declare they have received no funding pertaining to the present article.

Conflict of Interests

The authors have no conflict of interests to declare.

Acknowledgments

The authors are thankful to the Clinical Research Development Unit of North Khorasan University of Medical Sciences for their helpful cooperation.

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