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An Unusual Case of Ectopic Prolactinoma in the Clivus

Klivusta Sıra Dışı Bir Ektopik Prolaktinoma Olgusu

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Abstract

Ectopic pituitary adenomas occur mostly in the sphenoid sinus or nasopharynx, and rarely in the clivus. The differential diagnosis for a clival lesion is vast and includes chordoma (40%; being the most common), chondrosarcoma, meningioma, astrocytoma, craniopharyngioma, germ cell tumor, melanoma, non-Hodgkin's lymphoma, metastatic carcinoma, and rarely pituitary adenoma. Most of the adenomas detected in the clivus and those functioning endocrinologically, come out to be prolactinomas. Herein, the authors report a rare case of ectopic prolactinoma in the clivus in a 35-year-old male patient who reported with signs of weight loss, impotence, dizziness, and a clival lesion.

Keywords: Ectopic pituitary adenomas; prolactinoma; clivus

Özet

Ektopik hipofiz adenomları, çoğunlukla sfenoid sinüs veya nazofarinkste ve nadiren de klivusta görülmektedir. Klival lezyonun ayırıcı tanısı oldukça geniştir ve kordoma (%40; en yaygın), kondrosarkom, meningiom, astrositom, kraniyofarenjiyom, germ hücreli tümör, melanom, non-Hodgkin lenfoma, metastatik karsinom ve nadiren pitüiter adenomu içermektedir. Klivusta saptanan ve endokrinolojik olarak işlev gören adenomların çoğu prolaktinoma olarak ortaya çıkmaktadır. Burada yazarlar kilo kaybı, iktidarsızlık, baş dönmesi belirtileri ve klival lezyonu olan 35 yaşındaki erkek hastayı klivusta nadir görülen bir ektopik prolaktinoma vakası olarak sundu.

Anahtar kelimeler: Ektopik hipofiz adenomları; prolaktinoma; klivus

Introduction

Pituitary adenomas form the most common cause of a sellar or parasellar mass, comprising nearly 10 to 15 percent of all intracranial tumors (1,2). Prolactinoma is the most common cause of chronic hyperprolactinemia, excluding drugs. Although most of these tumors arise within the sella turcica, a few of them are located outside the intrasellar region and are therefore defined as ectopic prolactinomas (2). Erdheim first described an ectopic pituitary adenoma in 1909 (3). Ectopic pituitary adenomas frequently occur in the sphenoid sinus and surrounding structures (4). A pituitary adenoma rarely ensues in the clivus. Literature reports that most of the endocrinologically functioning adenomas in the clivus are prolactinomas (5). Ectopic pituitary adenomas are quite unusual and imaging methods must be utilized to establish that they are actually distinct from the intact pituitary and sella turcica. This paper reports the case of a 35-year-old male patient who was diagnosed by prolactinoma with a clival lesion.

Case Report

A 35-year-old male patient was admitted to the department of neurosurgery with complaints of impotence, weight gain, and dizziness for six months. Neurological examination did not reveal any pathology. The visual field was observed to be normal. The endocrinologic examination did not re-

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veal any pathology other than obesity (body mass index 40.4 kg/m^2). Laboratory examination revealed the presence of panhypopituitarism and hyperprolactinemia (Table 1). Magnetic Resonance Imaging (MRI) of the sella was performed at another center; the lesion was observed to be consistent with a mass that surrounded the carotid arteries at approximately 360 degrees, filling the cavernous sinus, spreading over the clivus, sphenoid sinus, and dorsum sellae (Figure 1). Although the diagnosis of prolactinoma was considered, it was decided to follow surgical treatment because the lesion was not located in the pituitary gland and caused hypopituitarism due to compression of the area. Transsphenoidal surgery was performed, and the mass was partially excised. Immunohistochemical staining of the pituitary adenoma established it to be a prolactin-producing tumor. Hydrocortisone treatment was administered to counteract the preoperative and postoperative hypocortisolism experienced by the patient. After the diagnosis of prolactinoma, cabergoline treatment was initiated at a dose of 1 mg per week that was titrated to 2 mg per week. The sellar MRI showed a lesion measuring approximately 4×1.5×3 cm in the largest area of the clivus (Figure 2). During follow-up, levothyroxine and hydrocortisone treatment were continued to counteract hypopituitarism. Also, testosterone replacement therapy was added to the treatment due to hypogonadotropic hypogonadism. After nine months of surgery, cabergoline dosage was increased to 3 mg per week since the prolactin level of the patient was 197 ng/mL.

Discussion

It is important to distinguish ectopic pituitary adenomas from invasive pituitary adenomas, the difference being based on the state (intact or damaged) of the dura mater covering the sellar floor. These changes can be appreciated in MR images. Ectopic pituitary adenomas may develop in the suprasellar region, sphenoid sinus, cavernous sinus, and clivus (6). Tumors of the clivus are rare and constitute 1% of all the intracranial tumors. Clival lesions include a broad differential diagnosis consisting of chordoma (most common; 40%), malignant tumors, metastatic carcinoma, and rarely pituitary adenoma (7). The present case was considered to be a prolactin-secreting adenoma because it was clinically and biochemically compatible with prolactinoma, and the same was proved by prolactin staining during the pathological examination.

Ectopic pituitary adenomas are thought to arise from residual cells along the migration tract of the pharyngeal pituitary as it travels from Rathke's pouch to the sella turcica (8). The literature describes more than 100 ectopic pituitary adenomas, most of which have originated in the sphenoid sinus (9). Ectopic pituitary adenomas are classified according to size as macroadenomas (> 1 cm) or microadenomas (<1 cm), just like pituitary adenomas. The tumor can be further classified as functional or nonfunctional, based on whether the cell type is hormone-secreting. Prolactin-secreting adenomas are the most common ectopic pituitary adenomas and constitute 48% of all the functional ectopic

Table 1. Preoperative and postoperative pituitary hormone tests.

	Preop	Postop	Reference Range
Free T4 (ng/dL)	**0.69**	0.86	0.70-1.48
TSH (IU/mL)	3.342	1.691	0.35-4.94
Prolactin (ng/mL)	**> 2000.00**	**293.52**	2.58-18.12
FSH (mIU/mL)	0.47	0.29	0.95-11.95
LH (mIU/mL)	0.27	0.04	0.57-12.07
Total Testosterone (ng/mL)	0.22	0.31	2,5-8.36
Somatomedin C (ng/mL)	180.0	135.0	115.0-307.0
ACTH (pg/mL)	11.6	43.1	5.0-46
Cortisol (µg/dL)	**<0.4**	10.6	3.7-19.4

FSH: Follicle stimulating hormone; LH: Luteinizing hormone; TSH: Thyroid stimulating hormone; ACTH: Adrenocorticotropic hormone.

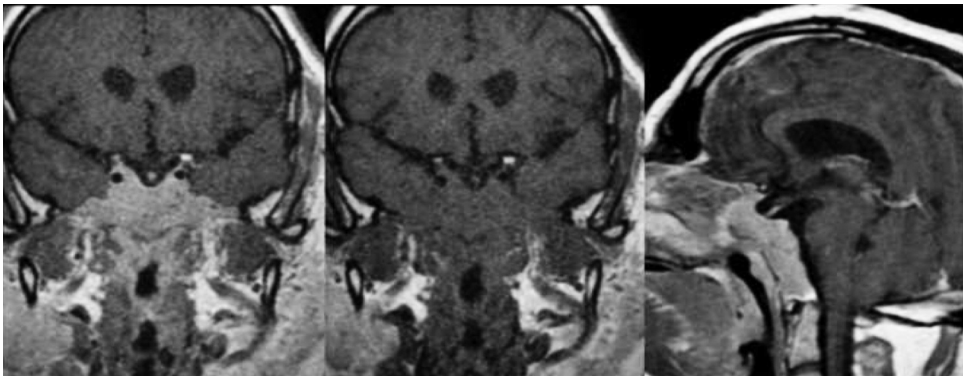

Figure 1: Preoperative magnetic resonance imaging.

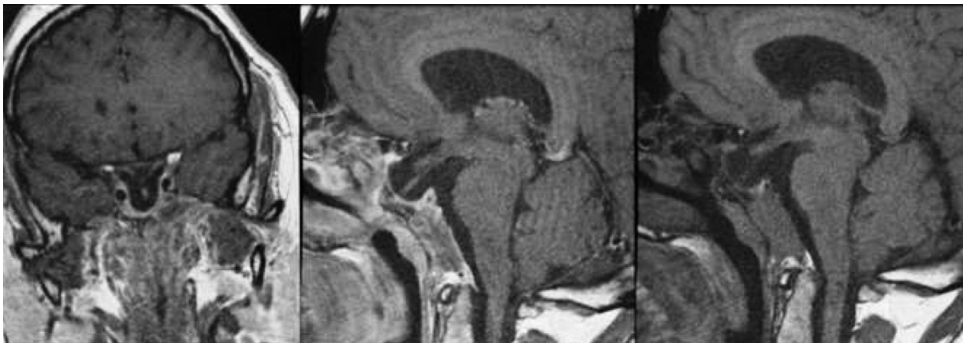

Figure 2: Postoperative magnetic resonance imaging.

adenomas (10). Prolactin-secreting adenoma was detected in this case, just as the ones that have been described in literature earlier. Scrutiny of case reports in the literature reveals that headache was the most common symptom in such patients. Classically, pituitary adenomas often present with bitemporal hemianopsia; yet, ectopic adenomas usually do not cause visual impairment unless they involve optic chiasm. In the present case, the patient complained of dizziness, and visual impairment was not detected (5,11). Fortunately, 76% of all the reported cases were functional adenomas, permitting a possible preoperative diagnosis based on history, physical examination, and basic lab tests alone. Growth hormone-secreting adenomas may cause an enlargement of the extremities, carpal tunnel syndrome, diabetes or acromegaly, and elevated IGF-1 (Insulin-like growth factor 1) in the laboratory. ACTH (Adrenocorticotropic hormone) secreting adenomas are associated with findings of hypercortisolism and Cushing's syndrome. The prolactinomas, that constitute a large part of such cases, are manifested by gynecomastia, erectile dysfunction, impotence, galactorrhea, amenorrhea, and elevated prolactin levels (5). The presence of impotence and high prolactin levels found in the present case were consistent with those of the case reports described in the literature.

Constantine L. Karras and colleagues reported a case wherein ectopic pituitary adenoma was reported to invade cavernous sinus and internal carotid artery (5). Similarly, in the present case also cavernous sinus and internal carotid artery invasion were observed.

No specific guideline for the treatment of ectopic prolactinomas has been described because of their low frequency. Dopamine agonists (bromocriptine, cabergoline) and somatostatin analogs (lanreotide, octreotide) or GH antagonists (pegvisomant) are defined as first-line therapy for prolactinomas and GH-secreting adenomas. Surgical treatment is indicated in those patients in whom serum PRL levels fail to normalize even with dopamine agonists, or who are intolerant for side-effects for these med-

ications, or whose tumors compress the optic nerves, or in patients who present with neurological symptoms as well (12). Dopamine agonists help provide conservative treatment to patients with aggressive adenomas, having a high risk of morbidity during complete resection, as seen in the present case. It was for this reason that cabergoline treatment was initiated after the surgery. Furthermore, adjunctive pharmacotherapy can also potentially delay or even eliminate the need for surgery, especially in elderly individuals or in those with significant medical comorbidities and relative contraindications to the surgery.

In conclusion, ectopic pituitary adenomas occurring within the clivus are rare, and the embryology of the pituitary gland may explain their occurrence. Since most of the adenomas detected in the clivus are functional in nature, the symptoms of these patients should be questioned in detail; physical examination must be carried out, and additionally, pituitary hormone levels should be measured.

Informed consent

Patient were informed about the research.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Murat Çalapkulu, Özen Öz Gül; Design: Control/Supervision: Murat Çalapkulu, Özen Öz Gül; Data Collection and/or Processing: Murat Çalapkulu, Özen Öz Gül, Soner Cander, Canan Ersoy, Erdinç Ertürk, Bahattin Hakyemez; Analysis and/or Interpretation: Murat Çalapkulu, Özen Öz Gül; Literature Review: Murat Çalapkulu; Writing the Article: Murat Çalapkulu, Özen Öz Gül; Critical Review: Murat Çalapkulu, Özen Öz Gül; References and Fundings: Murat Çalapkulu; Materials: Murat Çalapkulu, Özen Öz Gül.

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