Spontaneous regression of nonfunctioning pituitary macroadenoma: A case report

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1. Introduction

Spontaneous regression occurs frequently in cases of hormonally active pituitary adenoma but is rare in cases of nonfunctioning adenoma. We report here a case showing spontaneous regression of a nonfunctioning pituitary adenoma with no accompanying symptoms.

2. Case report

A 13-year-old girl who visited the hospital with a head injury secondary to syncope was referred to the department of neurosurgery because of an abnormality revealed by computed tomography (CT) scan and magnetic resonance imaging (MRI). The patient reported no symptoms but showed diminished eyesight in her right eye and decreased color perception on the upper right side. She had experienced menarche 1 year prior to the visit and reported recent irregularity in her menstrual cycle. An initial head CT scan detected a pituitary mass with a large suprasellar component and an area of slightly increased density (Fig. 1). MRI performed 3 weeks later showed that the mass was isointense on both T1- and T2-weighted images. T2-weighted images showed a small hyperintense area that was weakly enhanced by administration of a contrast agent. The pituitary stalk was deviated to the right side, and the optic chiasm was elevated (Fig. 2). The results of a pituitary stimulation test showed a small hyperintense area that was weakly enhanced by administration of a contrast agent. The pituitary stalk was deviated to the right side, and the optic chiasm was elevated (Fig. 2).

3. Discussion

Spontaneous regression of pituitary adenoma is frequently reported; however, the mechanism underlying this phenomenon is unclear. Previous reports have suggested various factors that may facilitate spontaneous regression, such as apoplexy, hormonal fluctuations due to childbirth, anticoagulation therapy, stress test of pituitary hormone, and bromocriptine treatment. Many of these reports describe cases of recurrence.
regression of tumor volume in 34 out of 304 patients (11%) [2]. Seven cases of spontaneous regression of nonfunctioning adenoma have been previously reported (Table 1) [3–8]. The average age of these patients was 48 years. Four of the patients were female. In 4 cases (57.1%), tumor regression was caused by pituitary apoplexy (PA). In one case of asymptomatic nonfunctioning adenoma, spontaneous intratumoral hemorrhage resulted in tumor regression [6].

Pituitary apoplexy is characterized by sudden severe headaches, nausea, vomiting, diminished visual acuity, visual field deficits, ocular paresis, ophthalmoplegia, and altered consciousness. Headache is the most common symptom, followed by visual deficits, nausea, vomiting, and ocular palsy [9]. In the present case, the patient experienced none of these symptoms.

CT and MRI are effective tools for the detection of pituitary hemorrhage. In cases of PA, CT typically shows patchy or confluent areas of high density within pituitary lesions, which are caused by the hemorrhagic component of most PAs [9]. However, MRI is superior to CT in its capacity to detect PA. It is well known that MRI signals indicating blood clots change over time, as do signals indicating cerebral hemorrhage [9,10]. MRI performed during the acute phase typically shows areas of hyperintensity on T1-weighted images and areas of combined hypo- and hyperintensity on T2-weighted images [9]. In the present case, although a repeat MRI performed 3 weeks after the initial visit showed no evidence of intratumoral hemorrhage, a patchy area of slightly increased density detected by the initial CT scan may have reflected a microhemorrhage.

The optimal treatment method for acute PA is controversial. Surgical intervention is necessary in the majority of PA cases, though conservative management may be used in certain cases. Correction of electrolyte imbalances, hemodynamic stabilization, and corticosteroid repletion are among the most important initial interventions. Surgical intervention is required in cases of acute deterioration of visual acuity [11,12].
However, conservative management is appropriate in patients such as ours who show mild visual defects and no concomitant endocrinological symptoms [3]. In this case, the patient showed no symptoms at the time of her clinic visits. Syncope may have been caused by mild apoplexy, which may have been reflected in the initial CT images. In such a case, a period of further observation would be necessary because of the possibility of tumor regression or change of disposition after follow-up.

The age of the patient described here is less than the average age of 48 years among patients with reported spontaneous regression of non-functional pituitary adenomas (range: 32–66 years, Table 1). Chentli et al. reported a case of a 9-year-old boy who was diagnosed with a somatolactotroph pituitary adenoma that showed spontaneous regression due to apoplexy [13]. Overall, however, cases of pediatric patients with regression of nonfunctional pituitary adenomas are rare.

On the other hand, since no pathology has been obtained, we cannot exclude that this young female patient who presented around the onset of puberty may have had physiologic enlargement of her pituitary gland, followed by spontaneous regression. We believe, however, that the imaging features with significant suprasellar irregular extension and non-homogeneous enhancement, and stalk deviation speak in favor of adenoma, however, MRI and CT imaging have not yet shown sufficient accuracy in the differential [15].

The patient described here was monitored for 2 years following her initial visit with no signs of tumor recurrence. Kamiya et al. reported a case involving a 22-year-old woman who experienced a recurrence of Cushing’s disease after long-term remission due to PA [14]. In the present case, although MRI showed complete disappearance of the original adenoma, it is unlikely that all of the tumor cells were destroyed, and therefore there may be a risk of recurrence. Thus, patients with spontaneous regression of pituitary adenomas such as the patient discussed here require careful follow-up study.

4. Conclusion

In this case report, we describe a patient with spontaneous regression of nonfunctioning pituitary adenoma. Though this is a relatively rare pathology, it is important for surgeons to monitor the volume of tumors prior to surgery in order to potentially avoid an unnecessary procedure.

References


Table 1

Summary of reported cases of nonfunctioning pituitary macroadenomas with complete spontaneous regression.

<table>
<thead>
<tr>
<th>Author [ref.]</th>
<th>Age and sex</th>
<th>Impaired hormone</th>
<th>Episode of apoplexy</th>
<th>Intratumoral hemorrhage</th>
<th>Treat.</th>
<th>Considered cause of reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zielinski [3]</td>
<td>55F</td>
<td>Cortisol +</td>
<td>+</td>
<td>HR</td>
<td>Apoplexy</td>
<td></td>
</tr>
<tr>
<td>Behar [5]</td>
<td>46F</td>
<td>Panhypo –</td>
<td>Unknown</td>
<td>None</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Yoshino [6]</td>
<td>32M</td>
<td>None –</td>
<td>+</td>
<td>None</td>
<td>Hemorrhage</td>
<td></td>
</tr>
<tr>
<td>35M</td>
<td>None Unknown</td>
<td>None –</td>
<td>Unknown</td>
<td>None</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Kachhara [7]</td>
<td>42M</td>
<td>None +</td>
<td>Unknown</td>
<td>None</td>
<td>Apoplexy</td>
<td></td>
</tr>
<tr>
<td>Norman [8]</td>
<td>57F</td>
<td>Panhypo +</td>
<td>+</td>
<td>HR</td>
<td>Apoplexy</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations used: ref. - reference number; panhypo. – panhypopituitarism; Treat. - treatment; HR - hormone replacement.

Fig. 3. Repeat MRI on admission showed partial regression of intrasellar and suprasellar lesions (a, b). The mass was further reduced in size 2 years after the initial examination (c).