online © ML Comm

CASE REPORT
Korean J Neurotrauma 2012;8:55-57 ISSN 2234-8999

Atypical Presentation of Acute Pituitary Apoplex Following Mild Head Injury

Han Jin Jang, MD and Cheol Su Jwa, MD

Department of Neurosurgery, National Medical Center, Seoul, Korea

Pituitary apoplexy usually presented with abrupt onset of neurological deterioration of headache, visual disturbance and decreased mental status. Post-traumatic pituitary apoplexy generally occurs in patients who have suffered from severe head injury, but there are rare reports occurred in patients with mild head injury. We describe a rare case of atypical presentation of acute pituitary apoplexy following mild head injury. A 68-year-old woman presented with right parietal scalp swelling after minor head trauma. Glasgow Coma Scale (GCS) score was 14. Initial computed tomography (CT) scans showed multiple contusions in the basal forebrain, falx hemorrhage and a linear skull fracture near the midline. In addition, there was a suprasellar-extended pituitary macroadenoma with suspicious intratumoral hemorrhage. After admission, cloudy consciousness, poor oral intake and high fever continued for several days. On seventh day, her condition has abruptly deteriorated and hypotensive shock developed. She recovered dramatically two days after steroid replacement therapy. The mechanism of pituitary apoplexy after mild head injury discussed with a relevant literature.

(Korean J Neurotrauma 2012;8:55-57)

KEY WORDS: Head injury · Pituitary apoplexy · Pituitary tumor.

Introduction

Pituitary apoplexy is a rare but life-threatening medical emergency. Causes of pituitary apoplexy include blood pressure alteration,[3] pituitary irradiation,[3] dopamine agonist treatment,[4] pituitary stimulation test,[3,10,14] and pregnancy.[11] Head injury may also be a rare cause of pituitary apoplexy.[5,13] Post-traumatic pituitary apoplexy generally occurs in patients severe head injury. However, there are few cases in which mild head injury is the cause.[12,13] We describe a rare case of acute pituitary apoplexy developed after mild head injury.

Case Report

A 68-year-old woman presented with scalp swelling in the right parietal area after minor head trauma. She had a medical history of diabetes mellitus and hypertension, but has been doing well with no specific symptoms. On admission, she was drowsy, but no weakness or visual field defects or cranial nerve disturbances were noted. Initial Glasgow Coma Scale (GCS) score was 14 and was classified as mild head injury. Initial skull X-rays showed a linear fronto-parietal fracture just next to the midline. Initial computed tomography (CT) scans revealed frontal, falx, and tentorial hemorrhage and small acute subdural hematoma was also seen in the left side. Additionally, there was an incidental pituitary macroadenoma with suspicious intratumoral hemorrhage. Subsequent magnetic resonance images (MRI) demonstrated intratumoral hemorrhage of pituitary macroadenoma (Figure 1). She had been conservatively treated during admission. Cloudy consciousness, poor oral intake and high fever (up to 38.2°C) continued for several days. Laboratory studies showed mild leukocytosis (11,800/uL), elevated erythrocyte sedimentation rate (114 mm/hr) and elevated high sensitivity C-reactive protein (113 mg/L), but serum electrolytes were within normal limits. Blood pressure was within normal range. Fever studies including chest X-rays, routine urine analysis, cultures of blood, sputum and urine were all negative findings.

Received: January 10, 2012 / **Revised:** February 3, 2012
Accepted: February 4, 2012
Address for correspondence: Cheol Su Jwa, MD
Department of Neurosurgery, National Medical Center, 245 Eulji-ro, Jung-gu, Seoul 100-799, Korea
Tel: +82-2-2260-7185, Fax: +82-2-2262-4869
E-mail: chsjwa@hanmail.net

Copyright © 2012 Korean Neurotraumatology Society

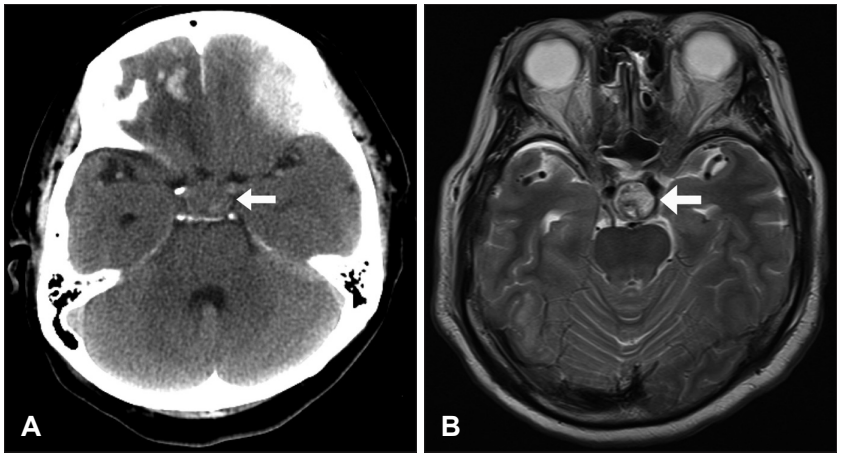

FIGURE 1. Initial computed tomography (CT) and magnetic resonance image (MRI) of the brain. Axial CT (A) and axial image of MRI (B) show multiple hemorrhagic contusions in the frontal base, falx hemorrhage and a suprasellar-extended pituitary macroadenoma with intratumoral hemorrhage (white arrows).

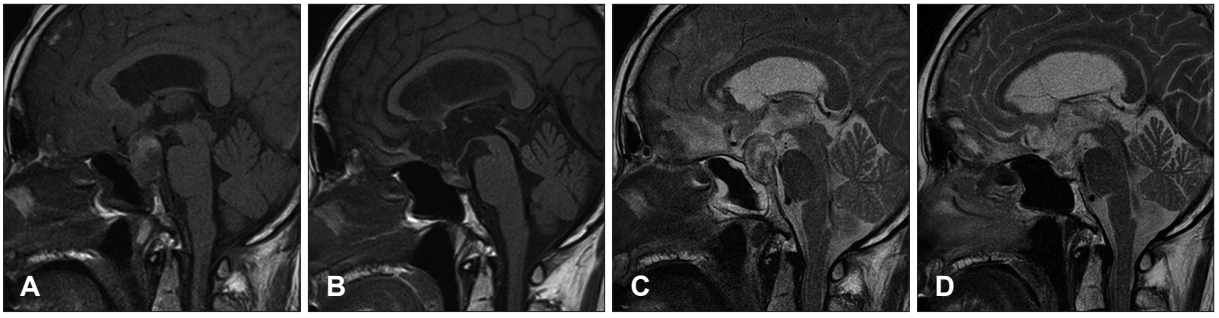

FIGURE 2. Initial (A, C) and follow-up (B, D) MRI of the brain. T1- and T2-weighted sagittal images (B, D) four months after head injury reveal total regression of pre-existing pituitary macroadenoma after pituitary apoplexy.

Broad-spectrum antibiotics and adequate hydration were performed because of the possibility of infectious conditions. On seventh day, her condition has abruptly deteriorated and hypotensive shock (up to 70/45 mmHg) developed. Intensive cares including endotracheal intubation, volume replacement and inotropic agents were performed, but her condition was not improved. Glucocorticoid was empirically administrated because of the possibility of secondary adrenal insufficiency of pituitary apoplexy. Two days after the start of steroid replacement, vital signs became stable and she recovered dramatically. In hormonal laboratory findings, serum thyroid stimulating hormone, growth hormone and prolactin were within normal limits, but serum adrenocorticotrophic hormone was low (<1.2 pg/mL). She had secondary adrenal insufficiency due to hypopituitarism, but no visual field defects. She discharged with oral prednisolone medication. Four months later, she complained of gait disturbance. Follow-up MR images showed total regression of pre-existing pituitary macroadenoma (Figure 2). She was discharged with oral steroid medication.

Discussion

In the present study, pituitary apoplexy was associated with intratumoral hemorrhage following head injury in patient with a clinically asymptomatic pituitary tumor. The patient had an asymptomatic pituitary macroadenoma with marked suprasellar component. The impact that produced the brain injury was to the right parietal region as demonstrated by physical examinations, skull X-rays and CT scans. High fever just after head injury may be typical finding in patients with acute pituitary apoplexy.[3,5,6,12,13] Glucocorticoid deficiency after secondary adrenal insufficiency may be a cause of the fever.[1] The fever may also occur due to the leakage of the blood or the necrotic tissue of destructive pituitary adenoma to subarachnoid space.[9] Traumatic hypopituitarism could be developed one week after the head injury.[5,11,12] MRI confirmed intratumoral hemorrhage of a suprasellar-extended pituitary macroadenoma.[3,12]

Pituitary apoplexy can be classified into the following forms: hemorrhagic infarction, simple infarction, and frank hemorrhage, of which the first two are the most common forms and the other is unusual event.[11] Head injury is a pre-

disposing factor for pituitary apoplexy.[5,13] The mechanism of pituitary apoplexy following head injury has not been identified. One possible cause of pituitary injury may be shearing force between the intra- and suprasellar part of the easy bleeding tumor.[5] Pituitary mass can be roughly into the intrasellar and suprasellar extended-portions. The intrasellar portion is tightly fixed by the bony structure around the sellar turcica, where as the suprasellar portion is located inside the basal cistern. The motion of the suprasellar portion is freer than that of the intrasellar portion. With respect to cause of the patient's apoplexy, impact trauma caused rotational and shearing force to the intracranial structure and suprasellar-extended tumor. The shearing force might act on the tumor at the junction between the intrasellar and suprasellar portions, causing direct intratumoral hemorrhage.[13] The other cause of pituitary injury may be direct injury by bone structure such as tuberculum sellae, dorsum sellae, or anterior clinoid process.[5]

Apoplexy in pituitary tumors is a well-established pathological process and is common in the natural history of the disease.[3] Pituitary apoplexy is one of the main causes of spontaneous regression of pituitary tumor.[2,7,8,15] The pituitary hemorrhage following head injury may increase pressure inside the tumor cavity, which may inhibit vascular supply of the tumor.[9] As a secondary effect, pituitary apoplexy might have caused the infarction by lowering perfusion pressure of the pituitary adenoma, leading to spontaneous regression by tumor necrosis.[2,7,8,15]

Conclusion

Mild head injury may produce traumatic pituitary apoplexy in patients with pre-existing pituitary adenoma, although it is extremely rare. If the fever is inexplicable and sustained after mild head injury, it must be thought the possibility of pituitary apoplexy. It may be also helpful early administration of glucocorticoid for the patients with suspicious pituitary apoplexy after head injury.

■ The authors have no financial conflicts of interest.

REFERENCES

1) Arlt W, Allolio B. Adrenal insufficiency. **Lancet 361**:1881-1893, 2003
2) Bjerre P, Lindholm J, Videbaek H. The spontaneous course of pituitary adenomas and occurrence of an empty sella in untreated acromegaly. **J Clin Endocrinol Metab 63**:287-291, 1986
3) Cardoso ER, Peterson EW. Pituitary apoplexy: a review. **Neurosurgery 14**:363-373, 1984
4) Gutin PH, Cushard WG Jr, Wilson CB. Cushing's disease with pituitary apoplexy leading to hypopituitarism, empty sella, and spontaneous fracture of the dorsum sellae. Case report. **J Neurosurg 51**:866-869, 1979
5) Horie N, Tokunaga Y, Takahashi N, Furuichi S, Mori K, Shibata S. [A case of pituitary apoplexy with severe consciousness disturbance following mild head trauma]. **No To Shinkei 54**:697-701, 2002
6) Jassal DS, McGinn G, Embil JM. Pituitary apoplexy masquerading as meningoencephalitis. **Headache 44**:75-78, 2004
7) Lever EG, Butler J, Moore P, Cox TC, Maccabe JJ. Infarction of a growth hormone-secreting macroadenoma during a TRH test. **Acta Endocrinol (Copenh) 112**:172-179, 1986
8) Nadkarni T, Desai K, Goel A. Spontaneous resolution of residual pituitary adenoma. Case report. **Neurol Med Chir (Tokyo) 45**: 315-317, 2005
9) Nishioka H, Haraoka J, Miki T. Spontaneous remission of functioning pituitary adenomas without hypopituitarism following infarctive apoplexy: two case reports. **Endocr J 52**:117-123, 2005
10) Okuda O, Umezawa H, Miyaoka M. Pituitary apoplexy caused by endocrine stimulation tests: a case report. **Surg Neurol 42**:19-22, 1994
11) Semple PL, Webb MK, de Villiers JC, Laws ER Jr. Pituitary apoplexy. **Neurosurgery 56**:65-72; discussion 72-73, 2005
12) Tamasawa N, Kurahashi K, Baba T, Hishita R, Murabayashi S, Kashiwamura H, et al. Spontaneous remission of acromegaly after pituitary apoplexy following head trauma. **J Endocrinol Invest 11**: 429-432, 1988
13) Uchiyama H, Nishizawa S, Satoh A, Yokoyama T, Uemura K. Posttraumatic pituitary apoplexy--two case reports. **Neurol Med Chir (Tokyo) 39**:36-39, 1999
14) Wakai S, Fukushima T, Teramoto A, Sano K. Pituitary apoplexy: its incidence and clinical significance. **J Neurosurg 55**:187-193, 1981
15) Wichers M, Kristof RA, Springer W, Schramm J, Klingmüller D. Pituitary apoplexy with spontaneous cure of acromegaly and its possible relation to Gd-DTPA-administration. **Acta Neurochir (Wien) 139**:992-994, 1997