

Case Report

Neurocysticercosis Involving the Pituitary Stalk : Case Report and Literature Review

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Neurocysticercosis (NCC) is the most common parasitic infestation of the central nervous system. Most cases of NCC are related and/or associated with inflammation within the cerebral parenchyma. A 71-year-old woman presented with a 4-year history of visual disturbance. This symptom had become aggravated 4 weeks earlier. Her visual acuity gradually decreased and superior hemianopsia was noted. Magnetic resonance imaging (MRI) revealed an enhanced and thickened pituitary stalk accompanying a suspicious mass. The provisional diagnoses were lymphoma, glioma, or other inflammatory conditions. Laboratory studies, including blood and hormonal studies, showed normal findings. Surgical resection was performed. In the pathological examination, degenerated parasitic wall structure was seen and its contents were composed of completely degenerated focal globular structures suggesting the scolex of cysticercus. We report an unusual case of NCC involving the pituitary stalk which was presented with a juxtaseptal tumor. The possible underlying mechanisms are discussed with a review of pertinent literature.

KEY WORDS : Neurocysticercosis · Pituitary stalk · Visual disturbance.

INTRODUCTION

Neurocysticercosis (NCC) is the common parasitic infestation of the central nervous system in worldwide. The clinical manifestations of NCC are varied and depend on the topography, number, and the size of the lesions, as well as the status of the host's immune response to the parasite⁴. NCC involving the pituitary stalk is one of the rarest forms of NCC^{1,9,14}. We herein describe an unusual case of NCC involving pituitary stalk and review pertinent literatures.

CASE REPORT

A 71-year-old female presented with a 4-year history of visual disturbance. Visual symptoms were becoming progressively deteriorated. There was no history of eye ball pain, headache, seizures, or any complaints suggestive of raised intracranial pressure. On the ophthalmological examination, visual acuity was 0.2/0.2 in both eyes and the patient showed

superior hemianopsia (Fig. 1). The anterior segments, pupils, and fundi were normal without evidence of abnormal ocular movement.

The patient was afebrile and, endocrinological and hematologic determinations were within normal limits. Magnetic resonance imaging (MRI) showed a normal pituitary gland with an abnormal thickening in the pituitary stalk. The proximal part of the pituitary stalk was very thin and distal one of the stalk was markedly thickened. The mass was hyperintense on T1-weighted image (T1WI) and hypointense on T2-weighted image (T2WI). Following intravenous administration of gadolinium, a slight heterogeneous enhancement was observed (Fig. 2).

The tentative preoperative diagnosis was inflammatory condition such as, histiocytosis X, sarcoidosis, lymphocytic hypophysitis or tumorous condition such as lymphoma, or glioma. A left pterional approach was performed to remove a juxtaseptal lesion. A yellowish, hard, and focal enlarged mass was found below the optic nerve attached to the superior surface of pituitary stalk (Fig. 3). It was removed from the pituitary stalk by meticulous dissection. Pathological examination of the specimen showed focal globular structures which were reminiscent of ova-like structure for the parasite and resulted in the final diagnosis of a degenerated cysticercosis (Fig. 4). Postoperative course was uneventful, but the visual field defect

• Received : November 20, 2009 • Revised : January 14, 2010

• Accepted : June 14, 2010

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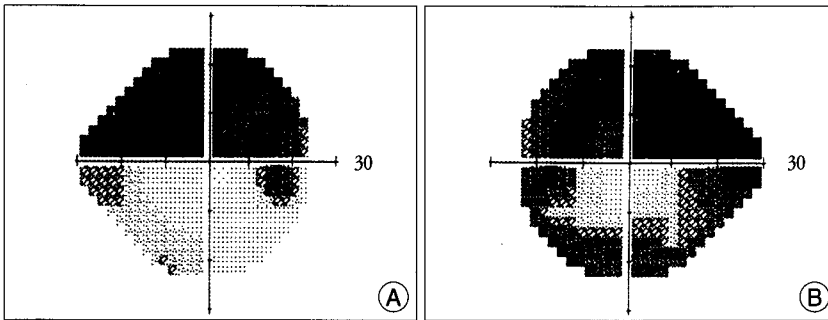


Fig. 1. Findings from automated perimetry (Humphrey 30-2 threshold program; Zeiss Humphrey Systems, Dublin, California, USA) of the right (A) and left (B) eye of 71-year-old patient show a superior hemianopsia on gray scale.

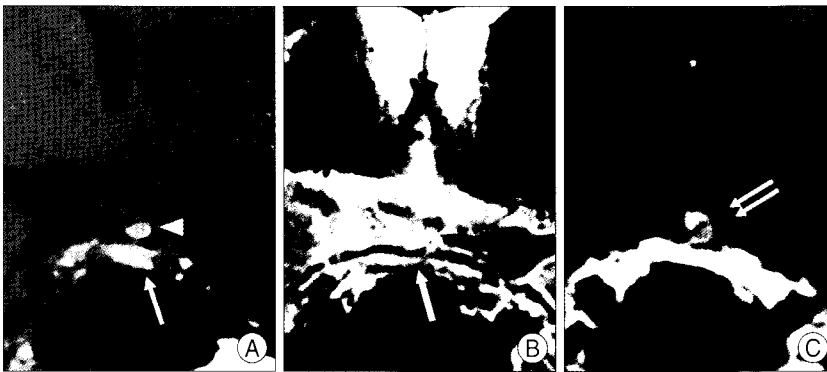


Fig. 2. Preoperative magnetic resonance image (MRI) with gadolinium (Gd) enhancement. T1-weighted (A) and T2-weighted (B) coronal section of a MRI reveal a normal pituitary gland (white arrow) with an abnormal thickening in the pituitary stalk (arrow head). Gd-enhanced coronal MRI (C) shows slightly heterogeneous enhancing lesion in the pituitary stalk (double arrows).



Fig. 3. Intraoperative photograph shows a yellowish, hard, and focal enlarged mass (black asterisk) which is detected below the optic nerve attached to the superior surface of the pituitary stalk (white arrow).

of the patient was not improved.

DISCUSSION

NCC is an infestation of the brain by *Taenia solium*, the tissue-invading larval form of the pork tapeworm. The larvae are introduced into the body by the ingestion of *Taenia solium* eggs in the focally contaminated food or water. Once ingested, the eggs hatch in the duodenum and release larvae. The

larvae then penetrate intestinal mucosa and enter the circulatory system, where they eventually localize as cysts within the skeletal muscles, the eyes, or the brain^{2,9,15}.

NCC is mainly located in gray matter or at the junction of gray and white matter with a rich blood supply⁹. In this intraparenchymal NCC, epilepsy is the most common clinical manifestation. Tuberculous granuloma, microabscess, focal meningo-encephalitis, neoplasms, and vascular lesions should be considered in the differential diagnosis^{11,12}. Extraparenchymal NCC refers primarily to infection of the ventricles and subarachnoid spaces. Clinical presentation is more aggressive behavior as compared to the parenchymal lesions, and generally, the prognosis of these patients is worse¹⁴.

Arriada-Mendicoa et al.¹ reported seven cases of sellar involvement of NCC in patients with unexplained visual loss or atypical cystic lesions in the sella. They proposed several mechanisms to explain the sellar compromise of NCC. Direct sellar invasion is the most commonly described mechanism. Intraventricular cysticercosis is the second most common form of the sellar compromise of NCC¹. Leptomeningeal involvement of NCC may cause intrasellar arachnoiditis, which is one of the most severe complications of NCC, associated with hydrocephalus, multiple cranial nerves dysfunction, and death¹. Subarachnoid involvement of NCC is in 3.5% of the patients with NCC present with parasites in vesicles of the subarachnoid space, presented with visual and hormonal impairment by direct compression of the hypophyseal stem and the optic nerves^{1,4,5}. In the absence of previous history of NCC involving pituitary stalk as in our case, it might be difficult to suspect NCC clinically or radiologically.

The mechanisms involving pituitary stalk of our case were postulated in light of hypothesized causal mechanisms of intrasellar NCC, which contained diverse mechanisms, ranging from direct or indirect invasion. We suggest that the mechanisms of involvement of pituitary stalk might include direct invasion affecting the hypophysis by NCC vesicles or indirect invasion through the thin walls of the cistern following involvement of subarachnoid space. It might develop an inflammatory lesion in the pituitary stalk, suggesting the

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latter process as a cause of her visual symptoms.

Although computed tomography (CT) is more sensitive for the detection of calcifications, MRI is the most accurate technique to assess the degree of infection, location, and the evolutionary stage of the parasites^{6,15}. Up to date the serological diagnosis of cysticercosis has been less than satisfactory, giving high false positive and false negative reactions^{7,13}. Enzyme linked immunosorbent assay (ELISA) of the cerebrospinal fluid (CSF) and serum enzyme-linked immunoelectrotransfer blotting (ELTB) provide more reliable results, but ELTB findings are positive in only 20% of subjects with a single parenchymal lesion and revert to negative after the cysticercosis died¹⁰. Despite the high false positive and negative rates, serological studies may be helpful in the differential diagnosis of NCC and should be used together with clinical and neuroimaging studies. In addition to clinical and neuroimaging studies, an accurate and complete patient history is crucial for NCC identification, particularly in endemic countries.

The treatment modalities available to patients with NCC include conservative treatment with antiparasitic drugs such as albendazole or praziquantel, being the first-line therapy in most cases of NCC. In a double-blind, placebo-controlled study of patients with seizures resulting from viable parenchymal cysts, antiparasitic drugs decreased the burden of parasites and was effective in reducing the number of generalized seizure⁸. In our case, we used a praziquantel for 2 weeks after the operation to eradicate other possible systemic involvements. Corticosteroids are used as adjuncts to cystocidal therapy to alleviate symptoms caused by the death of larvae, which occurs from 2 days to 5 days after initiating therapy¹⁴. If the clinical manifestations are caused by local mass effects in the CNS, such as increased intracranial pressure or hydrocephalus, surgical intervention is necessary³. Moreover, even if a solitary NCC is surgically removed, we suggest antiparasitic drugs should be administered to eradicate other possible systemic involvements.

CONCLUSION

We describe a 71-year-old woman with a NCC involving the pituitary stalk. NCC should be considered in the differential diagnosis of mass lesions in the pituitary stalk. Prompt surgical resection of the juxtaseellar lesion is also recommended for accurate diagnosis, to prevent progression of the disease,

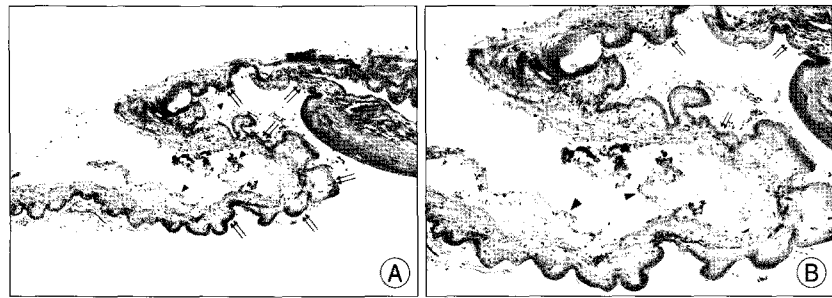


Fig. 4. Photomicrographs of the surgical specimen show degenerated parasitic wall structure having wavy dense cuticle (double arrows) and focal globular structures (arrow head) which is reminiscent of ova-like structure for parasites and resulted in the final diagnosis of a degenerated cysticercosis. H & E, original magnification, $\times 40$ (A), $\times 100$ (B).

and to avoid irreversible loss of the visual function.

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