Pituitary abscess: a case report

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Abstract

OBJECTIVES: Pituitary abscess is rare disease and the correct diagnosis is difficult because there are non-specific symptoms and it is often radiologically indistinguishable from other pituitary lesions.
CASE PRESENTENTION: We present one case of pituitary abscess that constitute 0.15% of all pituitary adenomas operated in our department in the 20 years. A 49-year-old woman presented with a history of 10 months bifrontal headache. The MRI showed cystic intra- and suprasellar mass with ring enhancement after contrast injection. During transsphenoidal surgery, copious yellowish pus was found. Antibiotic therapy was performed. Histological study of the cyst wall confirmed the diagnosis of pituitary abscess.
CONCLUSION: Pituitary abscess should be considered in the differential diagnosis of all other cyst mass in patients with diabetes insipidus.

INTRODUCTION

Pituitary abscess (PA) is relatively rare, represents less than 1% of all cases of pituitary disease (Jain *et al.* 1997; Su *et al.* 2006; Vates *et al.* 2001). We have identified only one case among 630 pituitary adenomas (0.15%) which were operated on in our department. The first reports were published by Helsop in 1848 and Simmonds in 1914 (Helsop 1848; Simmonds 1914). The most common presenting clinical features of pituitary abscess are headache, visual disturbance and pituitary insufficiency (Jain *et al.* 1997; Post *et al.* 1987). The preoperative diagnosis of pituitary abscess is difficult and is made during surgical exploration of the sella turcica (Danilowicz *et al.* 2008; Matsuno *et al.* 2005). In this report, we present a patient who had pus within the pituitary gland, and the pus was sterile on culture. No tumor in the sella was found. Therefore, the patient was diagnosed with a primary pituitary abscess. The clinical manifestations, imaging, and surgical treatment are discussed.

CASE PRESENTATION

A 49-year-old women was admitted with a history of 10 months severe bifrontal headache, general malaise and ceased menstruation. She had a history of hypothyroidism for 4 months and required hormone thyroid replacement therapy. At time of presentation she was afebrile hypocortisolic, hypogonadal without diabetes insipidus. Clinical examination revealed no neurological deficit. Visual acuities, visual fields et optic fundi were normal. The complete blood count was normal, with a

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white cell count of 5.6 G/L, and serum biochemistry was also normal. Hormonal profile was: TSH 1.63 μlU/ml (N 0.27–4.2), FT3 2.13 pmol/l (N 3.95–6.80), FT4 5.73 pmol/l (N 11.5–21), prolactin 237.4 μlU/ml (N 70–510), cortisol (0800h) 95.8 nmol/l (N 220–690), cortisol (1800h) 86.4 nmol/l (N 50–165), ACTH 12.2 pg/ml (N 0–55), FSH 1.35 mlU/ml (N 3.5–12), LH 0.1 mlU/ml (N 2.5–12.5). MRI revealed a 19 × 12 × 11 mm pituitary tumor with suprasellar extension, with decreased signal intensity on T1 weighted images and partial peripheral rim enhancement after gadolinium injection (Figure 1A,B). The transnasale transsphenoidal approach was performed. During surgery papery thin sella floor was noted. The mucosa of the sphenoid sinus was normal. When the sellar floor and the capsule was opened, thick copious yellowish pus was drained. No tumor was seen after evacuation of the purulent material and capsular tissue was partially excised. The postoperative course was uneventful. The patient was treated with antibiotic for 2 weeks. The pus was sterile on culture. For histological examination only small tissue fragments were received in 10% buffered formalin fixative. Whole material was processed by standard histological techniques. Histopathology of the pituitary lesion in hematoxylin and eosin-stained sections showed fragments of subacute abscess wall consists of a mass of acute inflammatory cells and fibrocollagenous tissue with degenerative changes (Figure 2A). Active granulation tissue consists of dense polymorphonuclear leukocytes infiltrate and few lymphocytes and plasma cells, intermingled with macrophages and fibroblasts (Figure 2B). Proliferating fibroblasts have contributed to the mature capsule sometimes densely collagenized and hyalinized. Fragments of intact normal pituitary was embedded in fibrotic tissue (Figure 2C). On histopathological evaluation any bacilli or fungus were visible in routine (Figure 2D) as well as special stain. There was no evidence of amyloid or tumor tissue of pituitary adenoma, craniopharynioma or Rathke's cleft cyst in obtained material.

After one a half years of follow–up, the patient continued thyroid replacement therapy. Postoperative MRI (5 and 17 months after surgery) showed high intensity on T1 weighted image residual intrasellar lesion 9 × 6 × 8 mm (Figure 3A,B) .

DISCUSSION

Pituitary abscess may present as a primary lesion, which occur within a previously healthy gland (70%) or may arise in underlying sellar pathological abnormality (30%), such as a craniopharyngioma, pituitary adenoma, Rathke's cleft cyst, Wegener's granulomatosis , head injury or following transsphenoidal surgery (Ahmed *et al.* 1989; Bognar *et al.* 1992; Dutta *et al.* 2006; Henegar *et al.* 1996; Jain *et al.* 1997; Metellus *et al.* 2002; Thiryayi *et al.* 2007; Vates *et al.* 2001). Culture of the pus is important for diagnosis and treatment. Pituitary abscess is caused either by unidentified bacteremia, septic thrombophlebitis of cerebral venous sinuses. The source of infection can be either haematogenous spread or direct extension from loco regional infec-

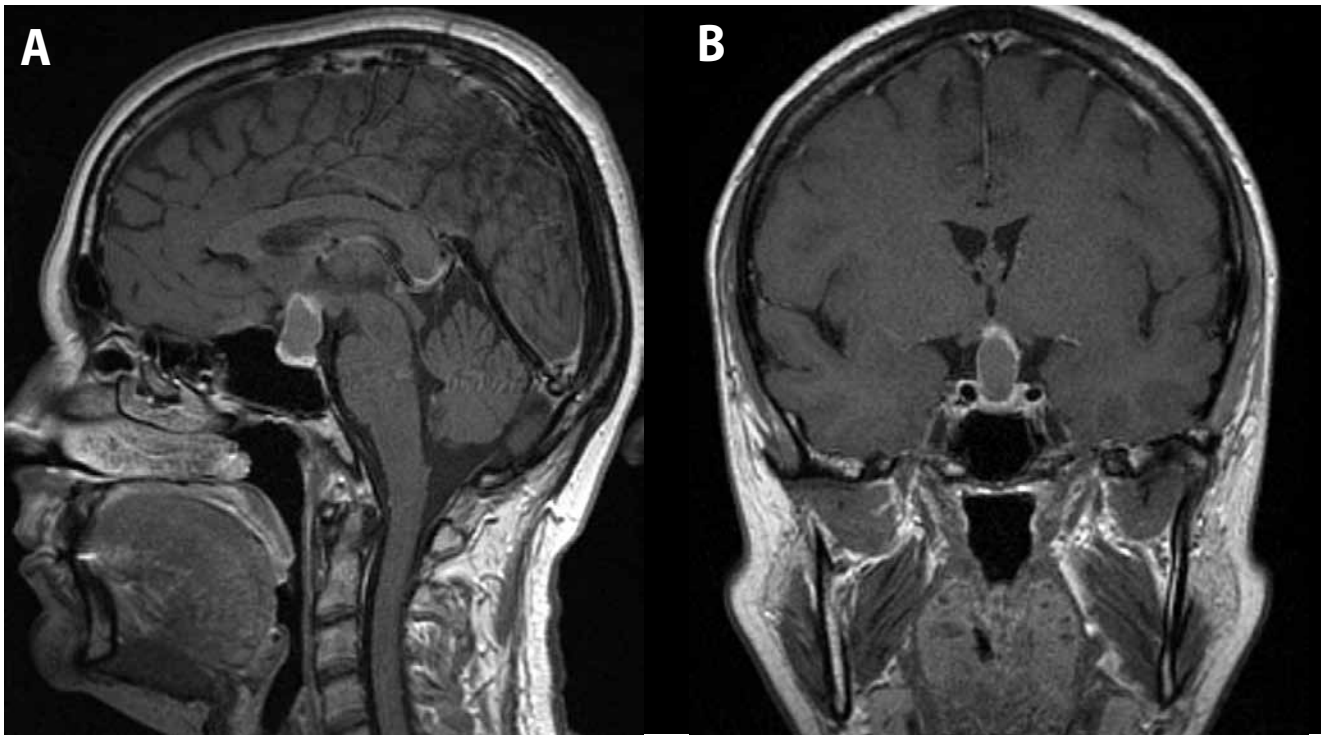

Fig. 1. Preoperative sagittal (**A**) and coronal (**B**) view T1 weighted gadolinium-enhanced MR images reveals isointense lesion in the sellar region with partial thin rim enhancement .

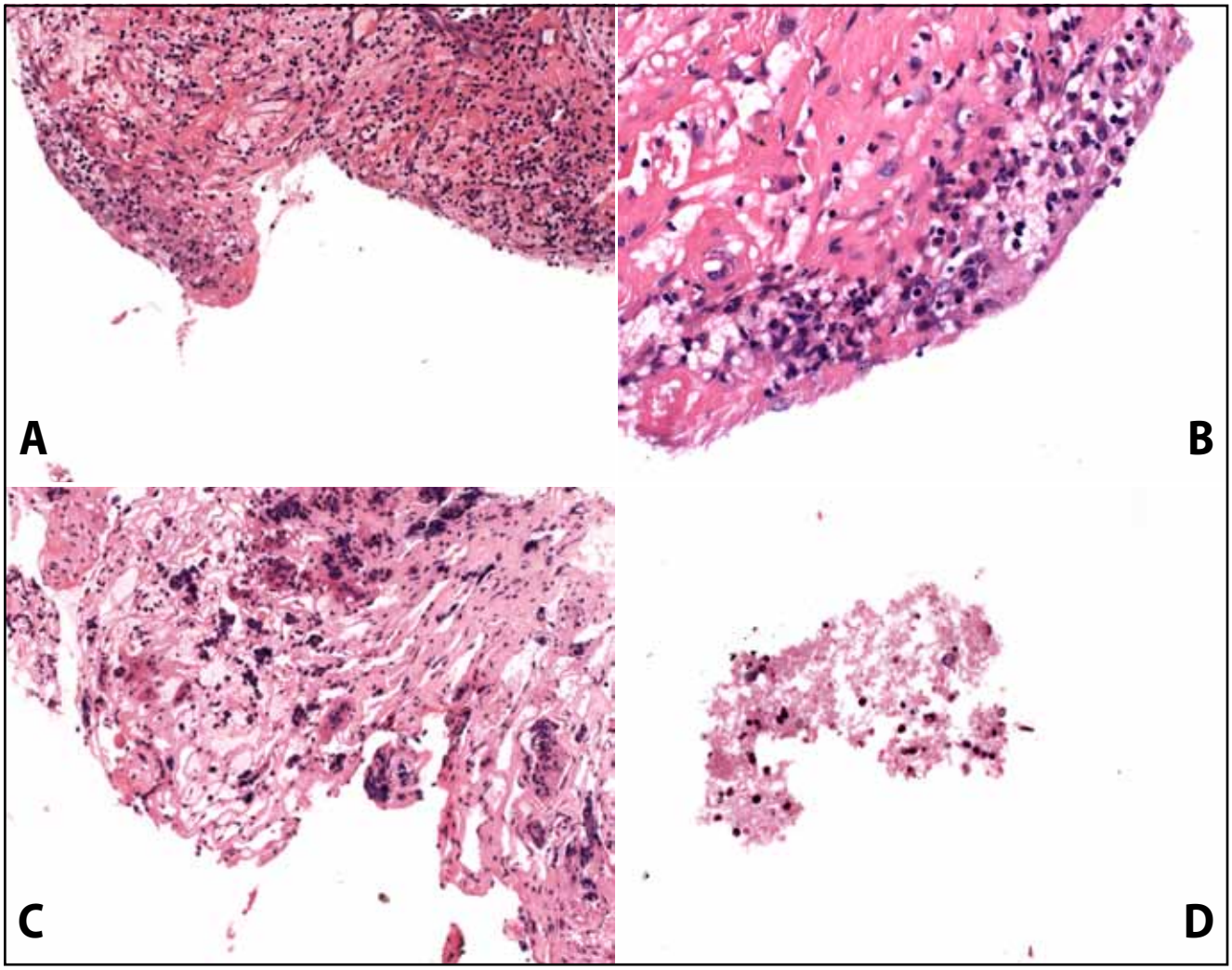

Fig. 2. A: Sheets of inflammatory cells at the edge of biopsy material. H&E stain, 200×. **B:** Inflammatory infiltrates rich in polymorphonuclear leukocytes, few eosinophils, scare lymphocytes and few plasma cells. H&E stain, 400×. **C:** Normal pituitary embedded in fibrotic and collegeneized tissue. H&E stain, 200×. **D:** Destroying parenchyma interspersed with neutrophilic infiltrate. H&E stain, 400×.

tion (Henegar *et al.* 1996). In previously reported cases, whole spectrum of microbiological agents have been described, including Gram-positive cocci (50%), Gram-negative bacilli, amoebae, yeast and fungi (Becker *et al.* 1980; Heary *et al.* 1995; Jain *et al.* 1997; Scanarini *et al.* 1991; Vates *et al.* 2001; Zhang *et al.* 2002). However, about 50% of pituitary abscess in the literature are reported to be sterile (Jain *et al.* 1997; Maartens *et al.* 2001; Matsuno *et al.* 2005). In our patient pus culture was also sterile. Controversy exists concerning the confirmation of PA in sterile lesion. Some authors consider sterile abscesses as sequel of the aseptic necrosis of pituitary tumors. Necrotic tumor tissue is a favorable site for development of infection (Bjerre *et al.* 1983). Thus, the source of the infection in our patient remains unclear. In addition, radiological views of the paranasal sinuses and transsphenoidal operation showed no signs of infection. Our patient also had no predisposing factors such as: systemic or local immunosuppression, pituitary irradiation , surgery or infarction (Henegar *et al.* 1996; Jadhav *et al.* 1998; Jain *et al.* 1997; Metellus *et al.* 2002).

The clinical manifestations of pituitary abscess are nonspecific, may simulate a nonfunctioning pituitary adenoma with headache, visual disturbance and hypopituitarism (Blackett *et al.* 1980; Danilowicz *et al.* 2008; Post *et al.* 1987; Vates *et al.*2001; Wolansky *et al.* 1997). Although, one-half of patients with pituitary abscess have diabetes insipidus, our patient did not. The presence of diabetes insipidus is suggestive of an etiology different from an adenoma because, diabetes insipidus is present in only 10% of pituitary adenoma (Blackett *et al.* 1980; Jadhav *et al.* 1998; Wolansky *et al.* 1997). The most common presenting clinical features of pituitary abscess are long-lasting headache (91.7%), pituitary insufficiency (54.2%), visual disturbance 50% and ophthalmoplegia (16.7%). No characteristic pattern of headache was described, as patients complained of bifrontal, retro-orbital and vertex headaches equally (Blackett *et al.* 1980; Ciappetta *et al.* 2008; Erdogan *et*

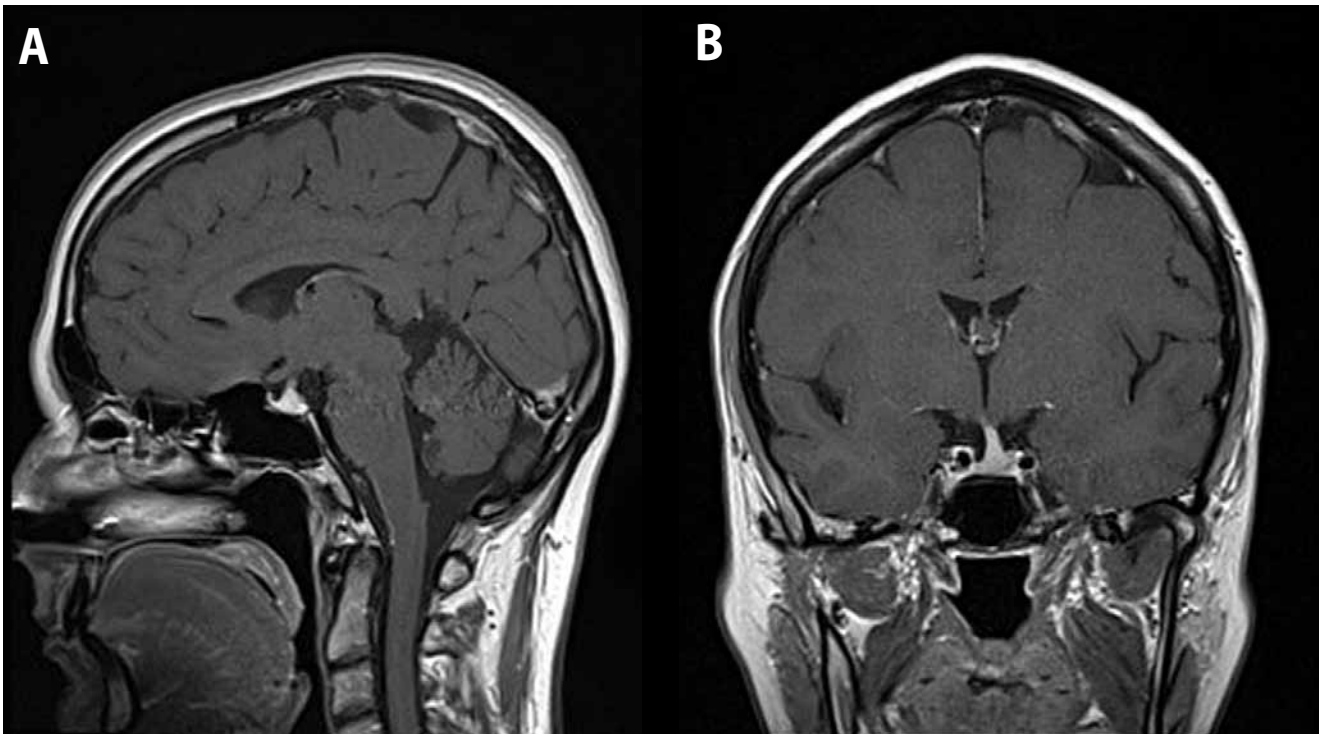

Fig. 3. Postoperative sagittal (**A**) and (**B**) view T1 weighted gadolinium-enhanced MRI scan (17 months after surgery) shows only a small remnant of the cyst abscess.

al. 2001; Vates *et al.* 2001). In the 25 cases reports by Dalan *et al.* (2008) headache was also the most common presenting symptom. Our patient had chronic bifrontal headache without visual deficit.

Preoperative diagnosis of pituitary abscess is difficult partly because patients do not commonly show systemic signs of inflammation, and it is often radiologically indistinguishable from other pituitary lesions (Ciappetta *et al.* 2008; Jadhav *et al.* 1998). Fever, peripheral leukocytosis or a raised erythrocyte sedimentation rate occur in only one-third cases (Hatiboglu *et al.* 2006; Jadhav *et al.* 1998; Vates *et al.* 2001). Among 25 cases analyzed by Dalan *et al.* (2008), only 6 (24%) patients had a fever with leukocytosis (Dalan & Leow 2008). This is in contrast with the recent review by Dutta *et al.* (2006). The authors show four cases of PA in which fever was always present. However, only one patient revealed the triad of fever, meningism and leukocytosis. This triad is mentioned as suggestive of PA. Our own case did not have any fever or leukocytosis. Therefore, it is important to consider pituitary abscess as a differential diagnosis in patients without sign of infection.

Pituitary adenomas account for 91% of all sellar lesions. The remaining 9% of sellar masses consist of a wide variety of pathologies (Dalan & Leow 2008). The differential diagnosis of sellar cystic lesions include adenoma, carcinoma, abscess, arachnoid cyst, colloid cyst, Rathke cleft cyst craniopharyngioma and arachnoid cyst (Sabbach *et al.* 1999; Wolansky *et al.* 1997). Pituitary abscess have a non-specific appearance on MRI. Hence, preoperative diagnosis of pituitary abscess remains difficult because, a peripheral contrast enhancing rim might be found in an abscess as well as in a cyst. Moreover the stalk thickening observed in PA is also demonstrated in granulomatous disease, lymphoma, metastasis or infundibuloneurohypophysisitis (Matsuno *et al.* 2005; Sabbach *et al.* 1999). Sellar round cystic mass isointense to grey matter on T1, high intensity signal on T2, with a peripheral rim enhancement following gadolinium injection and stalk thickening may be suggestive of pituitary abscess (Becker *et al.* 1980; Sabbach *et al.* 1999). The signal intensity may be affected by the abscess content : protein or hemorrahge (Wolansky *et al.* 1997). In addition, demonstrated maxillary and sphenoidal sinusitis is important to distinguish PA from tumors and to select the most appropriate surgical treatment.

The transsphenoidal approach is considered to be better choice, because it provides a route for prolonged drainage of the infected area and without contaminating the cerebrospinal fluid. This approach is associated with less morbidity. Craniotomy increase the risk of contaminating the CSF and causing meningo-encephalitis (Ciappetta *et al.* 1992; Goekalp *et al.* 1994; Heary *et al.* 1994).

Histopathological evaluation is essential for diagnosis of PA. It is characterized by presence of abscess wall infiltrated by inflammation cells.

CONCLUSION

A definite preoperative diagnosis is rare in the literature. In our patient , diagnosis was made also postoperatively. A pituitary abscess should be suspected in any patients with sings of an expanding cystic process in sellar region with a peripherial rim enhancement and diabetes insipidus.

Competing interests

The authors declare that they have no personal or institutional financial interest in materials or devices described in this article.

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