Pituitary Abscess In A Pre-Existent Invasive Pituitary Adenoma: A Case Report And Review Of The Literature

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Abstract

Pituitary abscess is a rare and life-threatening disease whose first description is credited to Simmonds in 1914. Its diagnosis is either made postoperatively or on postmortem, and rarely has it been made before operation. Thus its timely diagnosis and prompt treatment greatly improves the outcome. Surgery by the transphenoidal approach is the preferred one if a high index of suspicion exists.

We present a case herein of a 69 year old male patient who presented with a one month history of severe headaches, progressive diminution of visual acuity, diplopia and ophthtalmoplegia of the left eye (restricted movement of the left eye as well as drooping of the eyelid). All these symptoms were preceded a week earlier by an episode of a high fever for which he received oral antibiotics. No prior history of sinusitis was elicited. Neither was there associated diabetes insipidus nor other symptoms or signs suggestive of other endocrinopathies.

Clinical examination revealed ophthalmoplegia of the left eye, without any other significant clinical signs, neither did he have a fever probably given that he had already received antibiotics prior to his hospitalisation. Brain CT scan and MRI scan revealed a cystic intrasellar mass with suprasellar extension, with signs of invasion into the left cavernous sinus and dorsum sellae. Contrast enhancement was evident only on the cyst wall on the MRI images(T1).

Transphenoidal surgery was performed enabling evacuation of a large amount of purulent material that was immediately sent to the laboratory. Direct examination of this material showed gram positive diplococci, though the culture medium impregnation did not give any growth even after a week of waiting (looking for indolent growth). He was then given a full course of broad-spectrum antibiotics with a good clinical outcome.

In this article, we focus on the diagnostic challenges, treatment approaches and outcome as we review the literature.

INTRODUCTION

Pituitary abscess is a rare disease that is potentially life-threatening if prompt diagnosis and treatment is not made (2,3,8,11,12). Its presenting symptoms are not specific(1), making its preoperative diagnosis a challenge(7,13), but the presence of a fever or toxaemia in the presence of signs and symptoms of mass effect in the sellar region coupled with pituitary dysfunction(1) should help orient the Neurosurgeon toward an infective process in the sellar area.

Pituitary abscesses can occur denovo in otherwise normal pituitary tissue or sometimes superimpose on underlying pituitary pathology(1) such as pituitary adenoma, Rathke's cleft cyst, or craniopharyngioma(1,5,11). Adjacent sphenoid sinusitis should be ruled out(1) , and if found , should be treated appropriately to prevent aggravation of the disease or recurrences.

This case report gives details of a patient with visual symptoms coupled with left cavernous sinus syndrome, due to an intrasellar abscess. The clinical, endocrinological, biological radiological and histopathological findings are described and compared with some previous case reports. The mode of treatment and outcome will also be discussed.

CASE REPORT

A 69 year old male presented to our hospital with a one month history of intense bifrontal throbbing headaches

without any history of associated vomiting. This was associated with diminution of visual acuity bilaterally, diplopia, and ophthalmoplegia of the left eye(drooping of the left eyelid ,absence of eye movement on the same eye and fixed dilated pupil) . All these symptoms were preceded by a one week episode of a fever, for which he did consult a general practitioner who put him on antibiotics (Biomox® {Amoxicilline} 1gm twice a day for five days) with resolution of the fevers. There were no other symptoms such as anorexia, weight loss or symptoms consistent with systemic illness. His second consultation was at the ophthalmologist, who after doing a cerebral CT scan, referred the patient to our department.

Clinical examination revealed ophthalmoplegia in the left eye (deficits of cranial nerves III, IV and IV) and ptosis , fixed dilatation of the left pupil, and visual acuity of 4/10 on the right eye and 6/10 on the left eye ,with no papilledema. He was afebrile (temperature 36.90C) without any somatic motor or sensory deficits and neither meningeal nor toxaemic signs.

Brain CT scan (non-contrasted) revealed an intrasellar mass with accompanying invasion into the left cavernous sinus as well as the dorsum sellae. (Figure 1) The lesion was mostly hyperintense though heterogenous in nature on both T1 and T2 (non-contrasted) weighted MRI images, with a pronounced ring enhancement after gadolinium injection. On the coronal sections, it was evident that there was optic chiasmal compression and cavernous sinus invasion on the left side (Figures 2, 3). The full haemogram did not reveal any abnormalities (no leucocytosis), serum electrolytes were normal. The detailed hormone profile was as follows; LH = 2.22 m IU/ml, male (3.00 – 7.00),

FT3 2.37 pg/ml (1.71 – 3.71), FT4 0.70 pg/ml (0.7 – 1.48), TSH 1.74 µ IU/ ml (0.35 – 4.94),

FSH 7.49 m IU/ml (3.00 -7.00), prolactin 0.92 ng/ml (< 20), cortisol at 8 AM 8.8 µg /dl (3.7 – 19.4).

24 hour Urinary density was 1.015 (1.014-1.028) for a diuresis of 1000mls(normal).

However, his CRP= 132.5 and ESR =59 mm/1st hour (were tremendously elevated).

The patient was operated by the transphenoidal approach, which enabled the evacuation of a large amount of purulent material admixed with what was thought to be adenomatous tissue. Immediate direct examination of the sample revealed gram positive diplococci, though the culture medium did not give any bacterial growth even after a week of waiting.Histopathological examination was in favour of necrotised pituitary adenoma with the presence of cellular infiltrates.Figure4.

The patient was immediately on postoperation started on broad-spectrum intravenous antibiotics, which he received for 3 weeks, (ceftriaxone 4gms divided into two doses per day for 21days, metronidazole 1500mgs divided into three doses per day for 21 days and gentamicin 160mg per day for 5 days) then continued with a 4 week oral administration of SEPCEN® (ciprofloxacin) 1gm per day in two divided doses. The clinical course and outcome was good with progressive resolution of the ophthalmoplegia and improvement of the visual acuity. The postoperative contrasted CT scan did not reveal any residual lesion in the surgical field. Figure5. And postop hormone analysis did not reveal any anomaly.

Figure 1

axial non contrasted CT scan showing an intrasellar mass that invades into the left cavernous sinus and the dorsum sellae (see black arrows).

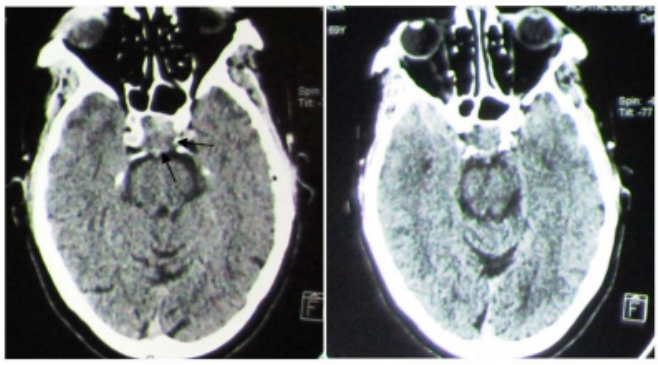


Figure 2

sagittal T1 and axial T2 weighted MRI scans without gadolinium showing a hyperintense heterogenous mass in the sellar region with suprasellar extension (see the sagittal cut section)

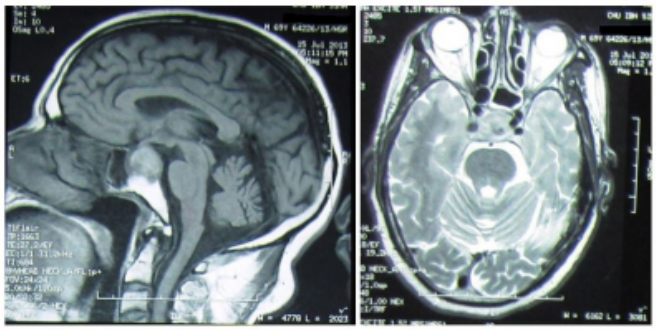


Figure 3

coronal and sagittal T1 weighted MRI scan with gadolinium contrast showing the same mass in the sellar region with suprasellar extension, showing a ring enhancement and mass effect on the optic chiasma and pituitary stalk thickening.

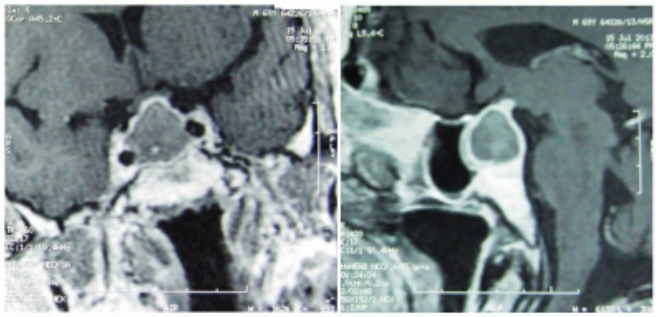


Figure 4

Histopathological slides (a)X100 and (b) X400 showing totally necrotised adenomatous tumour tissue with cellular infiltrates

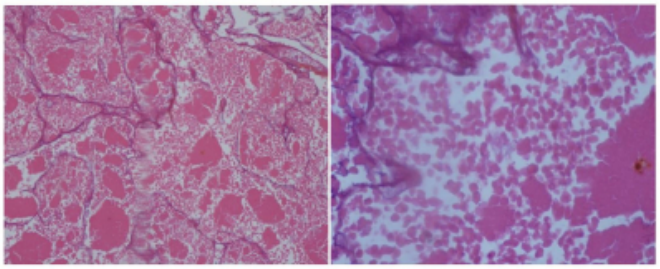
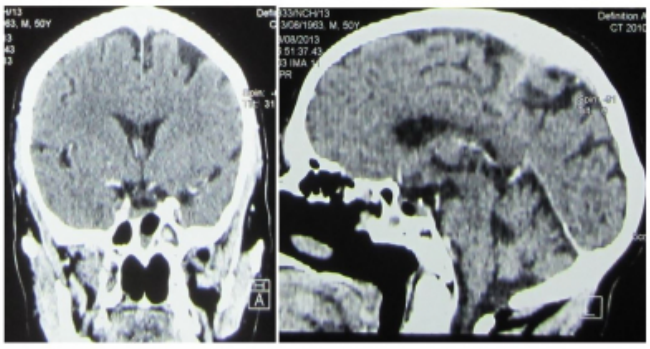


Figure 5

postoperative contrasted CT scan(coronal and sagittal sections) showing no residual abscess and /or tumour mass.



DISCUSSION

Pituitary abscess is a very rare pathology in the field of Neurosurgery accounting for 0.2-0.6% of all pituitary lesions (2-6). It is potentially life-threatening (5,8,10-12). Its diagnosis is difficult preoperatively even with newer imaging techniques such as CT and MRI scanning. (2,7,10,12) So far only about 210 case reports have been described in the literature (4), starting with the first one, that was described by Simmonds in 1914.

Pituitary abscesses can occur denovo in an otherwise normal pituitary gland (primary pituitary abscess) or in a pre-existing pituitary pathology (1,2,5-7) (such as pituitary adenoma, Rathke's cleft cyst or craniopharyngioma)or following surgery for pituitary region tumours(adenoma)(2,6,12) (secondary pituitary abscess). A pituitary abscess can be acute or chronic, but symptoms usually develop over a few months (7). Simmonds described the first case of primary pituitary abscess in 1914 (2,7,12,13), and the first case report describing a secondary pituitary abscess was made by Whalley in 1952 as an autopsy finding (5). Tumours are possibly vulnerable to infection because of impaired circulation, areas of necrosis or local immunological impairment (7,11-13). While such explanations remain speculative, pituitary abscesses are too frequently simultaneous with expanding sellar lesions to attribute this association to chance (11). Kroppensted et al. documented changes in MRI imaging of a patient who developed an abscess within her preexisting sellar tumour just after a tooth extraction. Their finding also supports the hypothesis that presence of a tumour may determine changes in local control of infection, facilitating its occurrence (11). In the absence of tumour, pituitary abscess may be the result of either direct extension from meningitis, sphenoid sinusitis, cavernous sinus thrombophlebitis , a contaminated

CSF fistula or haematogenous spread(1,3,7,11,12). The usual organisms implicated are; staphylococcus(3,6,7), streptococcus(3,6) , pneumococcus(3,11) Neisseria spp, E.Coli, corynebacterium spp(11) and other less common ones are Acinetobacter, gram negative bacilli, fungi, amoebae and yeast (1,13). Almost half of Pituitary Abscesses have been reported to be sterile (1,2,6,7,13). It is worthwhile noting that most fungal infections are associated with some kind of immunosuppression (11).

Vates et al (2001, J Neurosurg 95: 233-241) suggested that the most common presenting complaint of pituitary abscess was headache. The usual clinical features are chronic headaches, visual disturbances and pituitary insufficiencies such as diabetes insipidus (6), which is less common in association with pituitary adenomas (3-4). Thus the presence of diabetes insipidus might be of value in the differential diagnosis of pituitary abscess and pituitary adenoma, since it occurs in only 10% of pituitary adenoma patients, compared with 50% in those harbouring pituitary abscesses (3,7,12,13). Our patient did have headaches, visual disturbances, but not diabetes insipidus either at onset or after surgery, (though he did have isolated hypoprolactinaemia as well as reduced LH before surgery).

Dutta et al(2006, pituitary 9: 267-273) in a review stated that the triad of fever, meningism and leucocytosis is suggestive of Pituitary Abscess(2), which is in contrast to the findings of most of the authors of the previous case reports. Clinical symptoms reported in Pituitary Abscess are headache (91.7%), abnormal pituitary function (54.2%), visual disturbance (50%), ophthalmoplegia (16.7%) and diabetes insipidus (42.1%) (2). In Wilson's series only 33.3% presented with fever, 33.3% with elevated peripheral white cell counts and 25% with meningismus(2).Our patient had fevers and headaches preceding the visual disturbance and ophthalmoplegia, without any meningeal signs neither did he have a leucocytosis.

The advent of CT and MRI scanning has improved the diagnostic sensitivity to detect pituitary abscess. It helps verify the diagnosis of pituitary abscess by demonstrating a ring-enhancing pituitary lesion. On T2-weighted images, pituitary abscesses have a nonspecific appearance, but tend to give a high signal. On T1-weighted images, they characteristically have a signal intensity similar to that of the brain(12). This may suggest a solid lesion, such as an adenoma, and could dissuade one from considering an abscess in the differential diagnosis (3). However, radiological differentiation of intramural pituitary abscess from pituitary apoplexy is difficult (3). The signal intensity of an abscess may be affected by its protein content or presence of haemorrhage (1-3), and contrast enhancement may also be variable and difficult to interpret. It is even more challenging in the presence of concurrent pituitary pathology or postoperative changes in a patient who has undergone previous surgery for a pituitary lesion (1).

The presence of air-fluid level , meningeal enhancement , cerebritis, sphenoid sinus effusion or destruction of its floor, absence of posterior pituitary bright spot, cavernous sinus thrombosis are supportive of the presence of an abscess(1), pituitary abscess is said not to invade the cavernous sinus(3). Thus invasion of the cavernous sinus may herald a secondary infection of an invasive tumour such as a pituitary adenoma.

Histopathological evaluation is essential for the diagnosis of pituitary abscess besides aiding the exclusion of underlying pituitary pathology (such as adenoma)(1-3). It is characterised by presence of abscess wall infiltrated by polymorphonuclear leucocytes or macrophages with underlying necrosis (1). Histopathological studies of the specimen from our patient confirmed a necrotic pituitary adenoma admixed with polymorphonuclear leucocytes.

Early surgical drainage is the standard treatment of pituitary abscess to decompress the neurovascular structures being compressed and also prevent secondary hypopituitarism if not yet present (1-3,9,10). The transphenoidal approach is strongly recommended (1-3,5-8,12), craniotomy is only appropriate if the abscess is exclusively suprasellar or insignificant evacuation is contemplated by the transphenoidal route (1,9). However, craniotomy is rarely used because of the fear of contamination of the CSF space (1).

Following drainage, 4-6 weeks of parenteral antibiotics is recommended by various authors (1-5). Our patient did receive parenteral broad-spectrum antibiotics for three weeks followed by oral administration for another four weeks with a good clinical outcome. There have been a few case reports on the successful treatment with antibiotics alone (12).

Prognosis

The major cause of poor prognosis is delay in diagnosis and surgical treatment. Pituitary abscesses have an overall mortality of 28%, however those patients with meningitis

have a poorer outcome with a mortality of 45%(7).

CONCLUSION

Pituitary abscess secondary to invasive pituitary adenoma is a rare clinical entity and is potentially life-threatening. Preoperative diagnosis of pituitary abscess is a challenge but the presence of a fever besides symptoms and signs consistent with a mass lesion in the sellar region should orient the Neurosurgeon toward its diagnosis.

Early diagnosis followed by prompt surgery and initiation of antibiotic therapy is paramount(1,5,7,9,10) . Thus delayed diagnosis and treatment relates to a poor prognosis

References

1. Pinaki Dutta, Anil Bhansali, Paramjeet Singh, Narendra Kotwal, Ashish Pathak, Yashwant Kumar: pituitary abscess: report of four cases and review of the literature: Pituitary 2006; 9: 267-273
2. Karina Danilowics, Carlos Francisco Sanz , Marcos Manavela, Reynaldo Manuel Gomez, Oscar Domingo Bruno : pituitary abscess: a report of two cases : Pituitary 2008; 11: 89-92
3. Kadir Kotil, Turgay Bilge : primary pituitary abscess mimicking an adenoma: a rare entity : Turkish Journal of Endocrinology and Metabolism, 2004: 125-127
4. Srinivasa Kummaraganti, Ravi Bachuwar, Vikram Hundia:pituitary abscess: a rare cause of pituitary mass lesion : Endocrine Abstracts (2013) ;31 :273
5. Atsushi Kuge, Shinya Sato, Sunao Takemura, Kaori Sakurada, Rei Kondo, Takamasa Kayama: abscess formation associated with pituitary adenoma: a case report: changes in theMRI appearance of pituitary adenoma before and after abscess formation: Surg Neurol Int 2011; 2:3
6. P.D.Mohr: hypothalamic-pituitary abscess: Postgraduate Medical Journal, July 1975 ;51: 468-471
7. Semple Patrick Lyle, De Villiers Jacques C. : pituitary abscess : African Journal of Neurological Sciences/AJNS 1997 vol 16,No2
8. Su YH, Chen Y, Tseng SH : Pituitary Abscess : J Clin Neurosci 2006 Dec 13(10) : 1038-1041
9. Jadhav RN, Dahiwadkar HV, Palande DA : Abscess formation in invasive pituitary adenoma: case report : Neurosurgery 1998 ; Sept 43(3): 616-619
10. Nelson, Paul B, Haverkos, Harry, Martinez, Julio A, Robinson, Alan G: Abscess formation within pituitary tumours: Neurosurgery 1983;12: 331-333:
11. Ricardo Alexandre Hanel, Andrei Koerbel, Daniel Monte-Serrat Prevedello, Marlus Sydnei Moro, Joao Candido Araujo: Primary Pituitary Abscess : Arq Neuropsiquaitr 2002;60(3-B):861-865
12. Apjit Kaur, MS, Ajai Agrawal, MS, and Manish Mittal, MD: Presumed pituitary abscess without infectious source treated successfully with antibiotics: J Neuro-Ophthalmol 2005;25: 185-188
13. P.Sabbah, G.Bonardel, R.Herve, F.Marjou, F.Hor, C.Pharaboz, B.Bauduceau: CT and MRI findings in primitive pituitary abscess: a case report and review of the literature: J Neuroradiol, 1999; 26: 196-199

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