CASE REPORT

Pituitary abscess presenting two years after the diagnosis of a pituitary lesion in a patient with panhypopituitarism

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Submitted: 2012-04-15 Accepted: 2012-08-15 Published online: 2012-11-15

Key words: **pituitary abscess; panhypopituitarism; transsphenoidal surgery; pituitary adenoma; staphylococcus species**

Neuroendocrinol Lett 2012; **33**(6):574–578 **PMID:** 23160230 NEL330612C01

Abstract

Pituitary abscess is a rare condition. Here, we present the case of a young male patient who was initially found to have a pituitary lesion following the diagnosis of panhypopituitarism. Two years later, he presented with severe headache and was subsequently diagnosed intraoperatively with pituitary abscess. At a follow-up of 6 years after surgery, the patient was continuing to do very well. We discuss the differential diagnosis and demonstrate the evolution of the pituitary lesion on magnetic resonance imaging at four different time points: at the time of the detection of the initial lesion; two years later at the time of the diagnosis of the pituitary abscess; at 7 weeks post operatively; and finally after six years from the pituitary surgery.

INTRODUCTION

Pituitary abscess is a purulent inflammatory process of the pituitary gland. It has a frequency of <1% of pituitary disease. So far there have been about 260 reported cases, mostly in the form of isolated case reports (Ciappetta *et al* 2008; Liebert *et al.* 2010; Liu *et al.* 2011; Zhang *et al.* 2012; Kaur *et al.* 2005).

Pituitary abscess is frequently diagnosed intraoperatively and is categorized into primary and secondary types. The primary type comprises one-third of cases and arises in a previously healthy gland, while the secondary type comprises two-thirds of cases and arises in an existing pituitary pathology such as an adenoma, craniopharyngioma or Rathke's cleft cyst (Qi *et al.* 2009). The pathogenesis of secondary pituitary abscess is unclear. However, it could be due to impaired circulation and areas of necrosis or local immunological impairment in the tumor (Qi *et al.* 2009). The most common infectious agents are streptococci

and staphylococci. Other less reported agents include: diplococci, coliform bacteria, fungi, and *Mycobacteria tuberculosis* (Zhang *et al.* 2005; Vates *et al.* 2001).

Here, we describe a case of pituitary abscess that was diagnosed two years after the detection a pituitary lesion following the diagnosis of panhypopituitarism. We also demonstrate the evolution of the lesion on magnetic resonance imaging (MRI) from the time of the initial lesion till the time of the diagnosis of the pituitary abscess and the subsequent long term follow up period of 6 years.

CASE HISTORY

A 26 year-old male patient was initially diagnosed in 2004 with panhypopituitirism at age of 18 years. At that time, he presented to an outside hospital with headache, hair loss, decreased libido, and impaired ejaculation of 3 years duration. His laboratory tests showed thyroid-stimulating hormone (TSH) 4.6 μIU/ml (normal: 0.47–5 μIU/ml), free thyroxine (free T4) 7.4 pmol/L (normal: 10–25 pmol/L), luteinizing hormone (LH) 0.36 mIU/ml (normal: 0.8–7.6 mIU/ml), follicle-stimulating hormone (FSH) 0.8 mIU/ml (normal: 1.5–14 mIU/ml), total testosterone 0.35 nmol/L (normal: 8.5–36.5 nmol/L), prolactin 1280 pmol/L (normal: 180–810 pmol/L), and morning cortisol 154 nmol/L (normal: 138–690 nmol/L). A brain MRI showed a non-specific lesion in the adenohypophysis (Figure 1). Subsequently, he was diagnosed with panhypopituitarism and was treated with thyroxine, prednisolone, and testosterone. His symptoms markedly improved except, however, for a persistent mild headache.

In April 2006, at age 20 years, the patient presented to Jordan University Hospital with worsening headache of 1 month duration. The headache was bitemporal in distribution, worse at night, and impairing the patient's sleep. The patient had no fever, vomiting, or altered mental status. Physical examination was normal including adult size genitalia. There was no focal neurological deficit or visual impairment. Repeat laboratory tests, after stopping the medication for a few weeks, showed the same earlier results and confirmed the diagnosis of panhypopituitarism. His hemoglobin was 16.8 g/dL, white blood cell count 7.5×10^9/L, platelets 184×10^9/L, erythrocyte sedimentation rate 5 mm/hr, and C-reactive protein 0 mg/L. His liver and kidney function tests were normal. A follow up brain MRI showed interval progression with increase in the size of the pituitary lesion along with a central fluid collection (Figure 2).

In August 2006, the patient underwent transsphenoidal pituitary resection. Intraoperatively, a cystic mass was incised and pus was released. The culture from the purulent discharge grew coagulase-negative staphylococcus. Biopsy from the lesion was consistent with chronic abscess formation; it revealed tiny fragments of necrotic tissue with granulomatous changes and mixed inflammatory infiltrate composed of neutrophils, lymphocytes, and histiocytes (Figure 3). Staining for acid fast bacilli and mycobacterial cultures were not performed because of the small amount of pus and tissue samples. Subsequent blood cultures were negative. A trans-thoracic echocardiogram showed no vegetations and sinus CT showed mucosal thickening of both maxillary antra. The patient was treated with

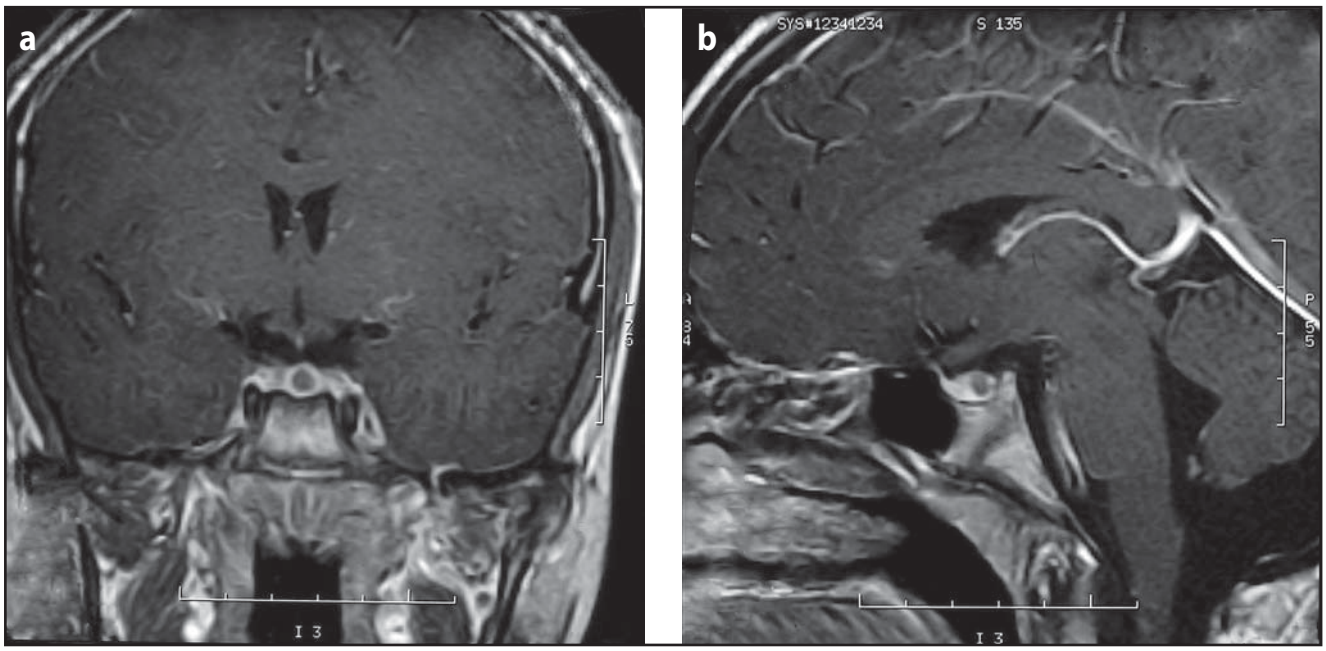

Fig 1 MRI of pituitary gland: coronal (**a**) and sagittal (**b**) weighted T1 images with intravenous contrast showing hypointense lesion in the posterior aspect of the pituitary gland measuring 4 × 5 × 2 mm.

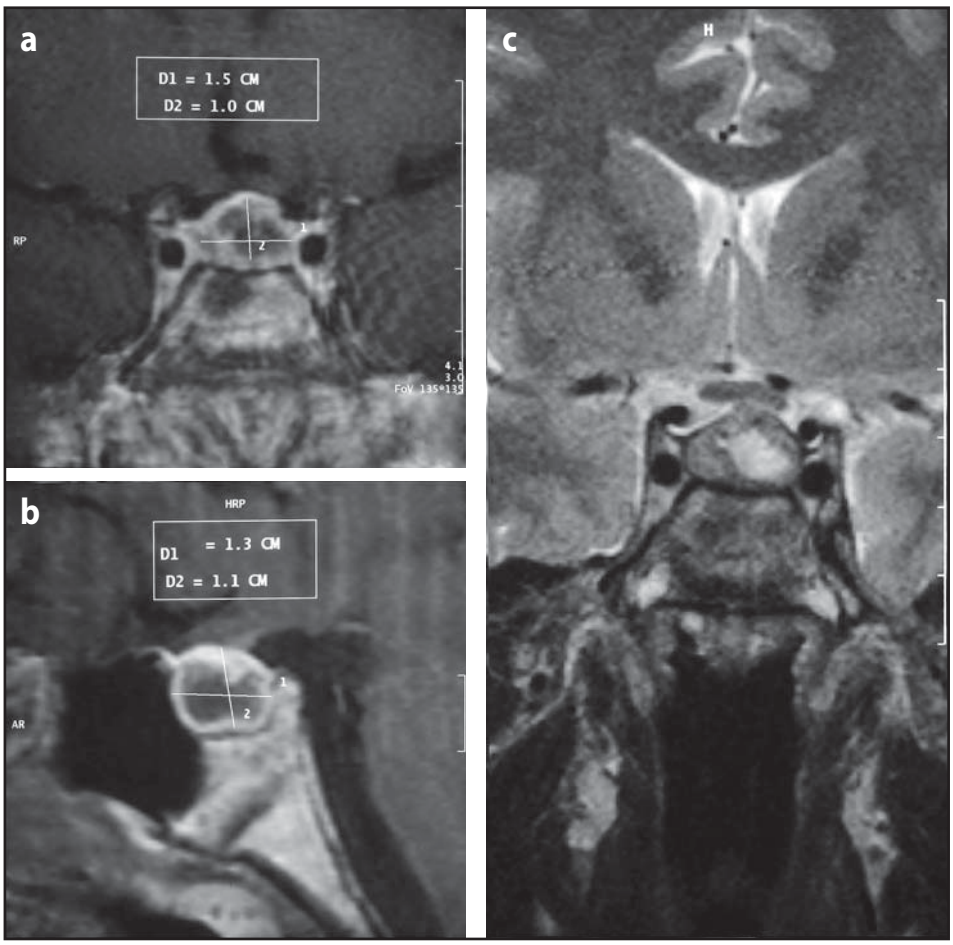

Fig. 2. MRI of pituitary gland: coronal (**a**) and sagittal (**b**) weighted T1 images with intravenous contrast showing hypointense lobulated lesion involving both the anterior and posterior lobes of the pituitary gland measuring 1.5 × 1 × 1.3 cm; coronal (**c**) T2 weighted image showing hyperintense lesion involving the left side of the pituitary gland and measuring 8 × 11 mm.

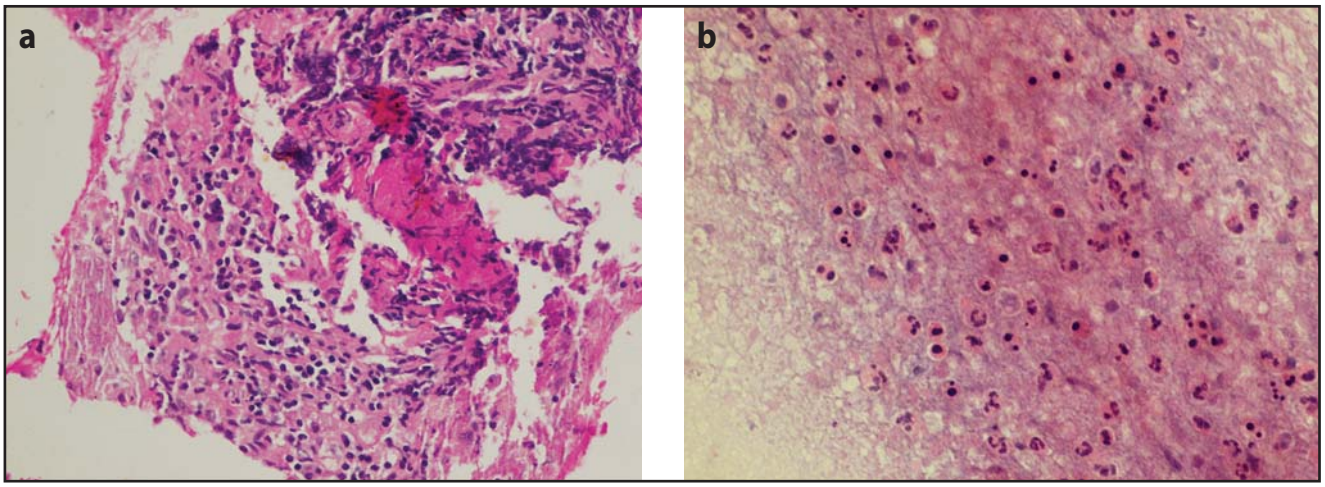

Fig 3 Granulomatous reaction formed of histiocytes and scattered lymphocytes with areas of necrosis (H&E stain, x 100) (**a**); Imprint cytology showing many neutrophils and lymphocytes in a necrotic background (H&E stain, x 100) (**b**).

parenteral vancomycin, ceftriaxone, and metronidazole for 4 weeks. Thereafter, his antibiotics were switched to oral amoxicillin/clavulanic acid for another 6 weeks. A follow up MRI, performed at 7 weeks after surgery, showed marked decrease in the size of the pituitary lesion (Figure 4).

Six years after the surgery, the patient continues to be asymptomatic and is still maintained on hormonal replacement therapy. His complete blood count was normal, erythrocyte sedimentation rate 10 mm/hr, and C-reactive protein 5 mg/L. A follow up MRI showed hemorrhage at the pituitary gland (Figure 5).

DISCUSSION

Here, we document the development of pituitary abscess in a patient with a preexisting pituitary lesion. The diagnosis was made by the intra-operative observation of pus coming out from the sella turcica and the subsequent growth of coagulase negative staphylococcus from the pus. The findings in the biopsy are also suggestive of pituitary abscess although the granulomatous changes could also be seen in other conditions such as tuberculosis, lymphocytic hypophysitis, sarcoidosis, and Wagner's granulomatosis (Carpinteri *et al.* 2009).

Kuge *et al.* (2011), in a case report of pituitary abscess stated that their case report was the second to describe changes in MRI exam before and after the formation of the pituitary abscess. They had noted that some reports described finding pituitary abscess as a primary pituitary lesion or in association with another underlying parasellar pathology and that there were few cases that confirmed changes in MRI before and after abscess formation. Kroppenstedt *et al.* (2001) described the first case to document the presence of pituitary lesion before the development of abscess. They reported a man who was diagnosed with pituitary adenoma by MRI and who after a short time had tooth extraction resulting in the development of pituitary abscess. In the second report, Kuge *et al.* (2011) described an incidentally detected pituitary adenoma that was followed 6 months later by oculomotor nerve palsy and hypopituitarism leading to the diagnosis of pituitary abscess. In our case, the pituitary abscess was detected after 2 years from initial diagnosis of the pituitary lesion. The exact nature of the initial lesion was not clear and several conditions such as pituitary adenoma, Rathke's cleft cyst, lymphocytic hypophysitis, or pituitary abscess could have resulted in the same MRI appearance.

The possibility that the initial lesion represented an abscess is unlikely because of the prolonged and almost asymptomatic course. Pituitary abscesses with such prolonged duration are rare and patients are usually symptomatic. Liu *et al.* (2011) found 5 cases, out of 33 cases of

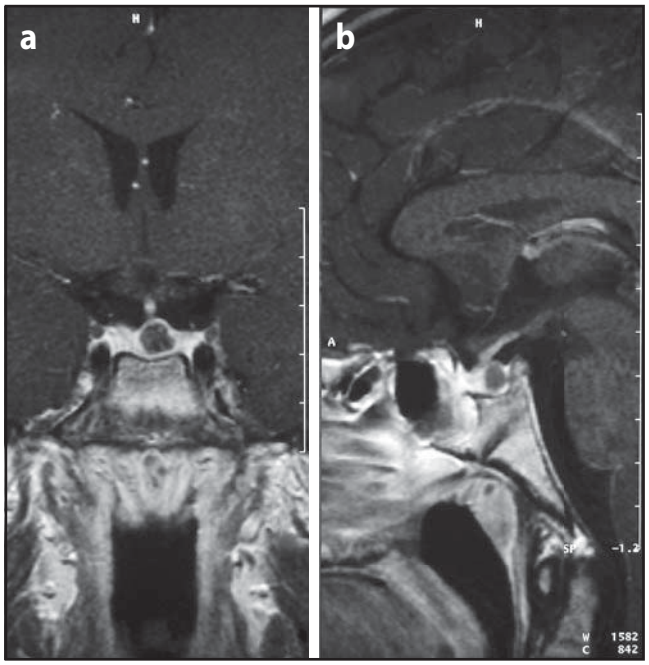

Fig. 4. MRI of pituitary gland: coronal (**a**) and sagittal (**b**) weighted T1 images with intravenous contrast showing hypointense lesion in the pituitary gland measuring 7 × 7 × 5 mm.

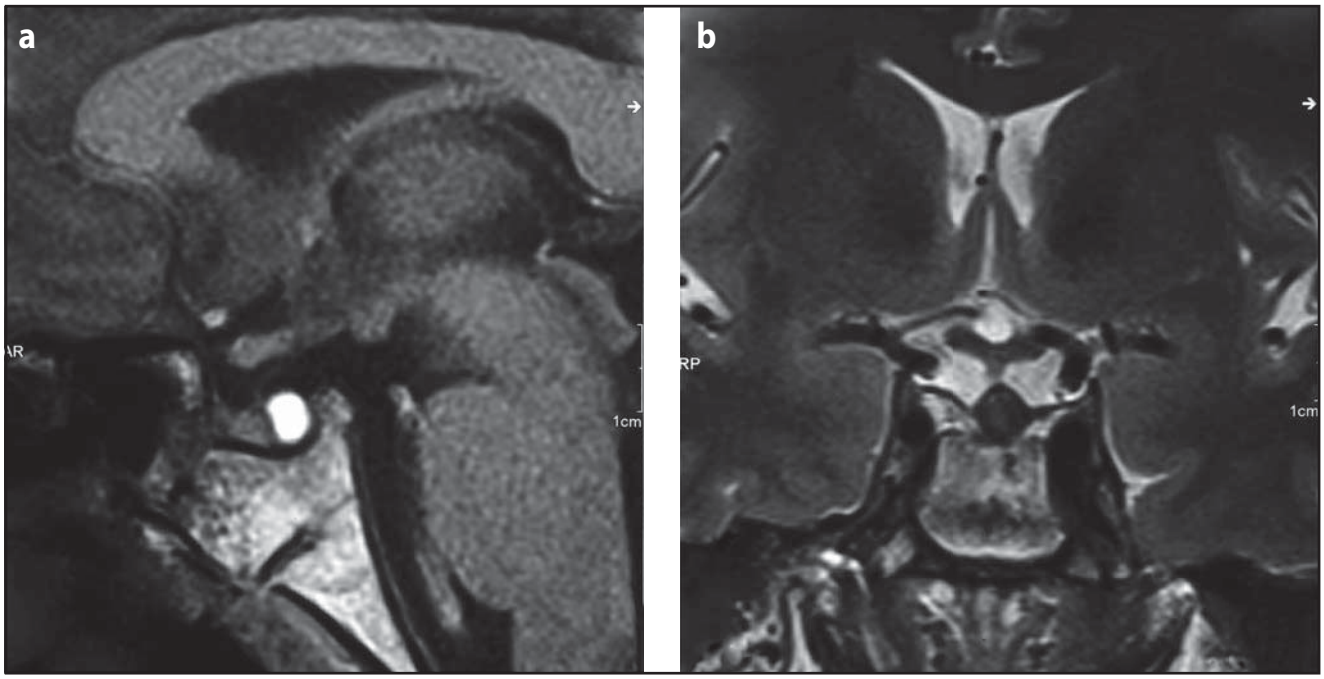

Fig. 5. MRI of pituitary gland: T1 sagittal image showing hyperintense lesion in the posterior aspect of the pituitary gland measuring 5 × 7 mm (**a**); T2 coronal image showing hypointense lesion in the posterior aspect of the pituitary gland measuring 7 × 7 mm (**b**).

pituitary abscess, with duration of symptoms equal or exceeding 2 years. Dalan & Leow (2008) have reported one case, out of 24 cases, with 2 years of duration. Other granulomatous conditions notably tuberculosis or lymphocytic hypophysitis are also unlikely; Tuberculosis in absence of treatment would have most probably resulted in a poor outcome contrary to the excellent outcome seen in our case (Thwaites *et al.* 2009). Lymphocytic hypophysitis is a non-pyogenic autoimmune granulomatous condition, is more frequent in women, the mean age at diagnosis is 35 years for females and 45 years for males, is more frequently associated with other autoimmune conditions, and has a characteristic histopathological appearance with polyclonal lymphocytic infiltrate (Carpinteri *et al.* 2009).

The availability of an earlier MRI exam here provides a rare opportunity to study the evolution of the pituitary abscess over an interval period of two years. The MRI appearance has shown peculiar changes over time; compared to the initial lesion, the lesion being diagnosed as pituitary abscess had shown marked increase in size with its margins appeared touching the optic chiasm. Its outline had also transformed from being regular to being irregular and lobulated. The follow-up MRI, performed 7 weeks after the surgery, showed an expected decrease in the size of the lesion. The most recent follow-up MRI, performed 6 years after the surgery, showed different intensity of the lesion with hyperintensity in T1 and hypointensity in T2 weighted images suggesting hemorrhage. Therefore, we recommend that changes in the size and outline of pituitary lesions be regarded as highly suspicious for the development of abscess.

CONCLUSION

Pituitary abscess remains a difficult diagnosis. Pituitary lesions should be evaluated and followed up by MRI and evolving cystic changes should be viewed with suspicion for the development of necrosis, hemorrhage, or infection. Endoscopic trans-sphenoidal surgery and antibiotics are optimal treatments for pituitary abscess.

Conflict of interest

The authors declare no conflict of interest.

REFERENCES

1 Carpinteri R, Patelli I, Casanueva FF, Giustina A (2009). Pituitary tumours: inflammatory and granulomatous expansive lesions of the pituitary. Best Pract Res Clin Endocrinol Metab. **23**: 639–650.
2 Ciappetta P, Calace A, D'Urso PI, De Candia N (2008). Endoscopic treatment of pituitary abscess: two case reports and literature review. Neurosurg Rev. **31**: 237–246.
3 Dalan R, Leow MK (2008). Pituitary abscess: our experience with a case and a review of the literature. Pituitary. **11**: 299–306.
4 Kaur A, Agrawal A, Mittal M (2005). Presumed pituitary abscess without infectious source treated successfully with antibiotics alone. J Neuroophthalmol. **25**: 185–188.
5 Kroppenstedt SN, Liebig T, Mueller W, Gräf KJ, Lanksch WR, Unterberg AW (2001). Secondary abscess formation in pituitary adenoma after tooth extraction. Case report. J Neurosurg. **94**: 335–338.
6 Kuge A, Sato S, Takemura S, Sakurada K, Kondo R, Kayama T (2011). Abscess formation associated with pituitary adenoma: A case report: Changes in the MRI appearance of pituitary adenoma before and after abscess formation. Surg Neurol Int. **2**: 3.
7 Liebert W, Szymaś J, Waśko R, Paprzycki W (2010). Pituitary abscess: a case report. Neuro Endocrinol Lett. **31**: 597–601.
8 Liu F, Li G, Yao Y, Yang Y, Ma W, Li Y, Chen G, Wang R (2011). Diagnosis and management of pituitary abscess: experiences from 33 cases. Clin Endocrinol (Oxf). **74**: 79–88.
9 Qi S, Peng J, Pan J, Lu Y, Fan J (2009). Secondary abscess arising in a craniopharyngioma. J Clin Neurosci. **16**: 1667–1669.
10 Thwaites GE, Schoeman JF (2009). Update on tuberculosis of the central nervous system: pathogenesis, diagnosis, and treatment. Clin Chest Med. **30**: 745–754.
11 Vates GE, Berger MS, Wilson CB (2001). Diagnosis and management of pituitary abscess: a review of twenty-four cases. Neurosurgery. **95**: 233–241.
12 Zhang X, Sun J, Shen M, Shou X, Qiu H, Qiao N, Zhang N, Li S, Wang Y, Zhao Y (2012). Diagnosis and minimally invasive surgery for the pituitary abscess: A review of twenty nine cases. Clin Neurol Neurosurg. **114**: 957–961.