A Rare Case of Pituitary Abscess in a Young Nigerian Woman

Ezeani IU, Nkpozi MO, Uwanurochi VN, Ogbonna SU

ABSTRACT

Introduction: Pituitary abscess is a rare condition, which diagnosis is usually made during surgery. An uncommon cause of panhypopituitarism, pituitary abscess has not been reported in Nigeria before now to the best of our knowledge. The objective of this article is to report this first case of pituitary abscess in a young Nigerian woman. Case Report: A 16-year-old female presented with recurrent generalized convulsion, impaired consciousness, fever, and vomiting of few hours duration. History of a prior severe headache and visual impairment that has lasted three years was given by the mother. Examination revealed a small for age girl who was febrile, dehydrated, and unconscious. Treatment for acute bacterial meningitis was commenced with empirical antibiotics (intravenous Ceftriaxone 1 g 12 hourly for 10 days). With further bouts of seizure and recurrent vomiting, brain computed tomography (CT) scan was done three weeks after onset of illness and it showed widening of the sella turcica and an isodense mass with a well-defined margin (measuring 24 × 44 mm) within the sella turcica. A diagnosis of pituitary macroadenoma was made. Her pituitary hormones profile was within normal range but she had decreased plasma estrogen and morning cortisol. Follow-up assessment at 18 years revealed absence of female secondary sex characteristics, primary amenorrhea, and visual field defects. Intraoperatively, 15 mL of pus was drained from a pituitary abscess accessed via frontal craniotomy. Culture of the abscess yielded Listeria organisms sensitive to Ceftriaxone. Postoperative outcome was good.

Conclusion: Pituitary abscess may present initially with neurological and mass effect symptoms; definitive diagnosis is made during surgery.

Keywords: Bacterial meningitis, Craniotomy, Pituitary abscess, Panhypopituitarism

INTRODUCTION

Pituitary abscess is a rare life-threatening disease which is often misdiagnosed as a pituitary tumor [1] based on the mass effect symptoms and features after imaging studies. Definite diagnosis is usually made postoperatively. Symptoms of pituitary abscess include headache, impaired vision, and manifestations of pituitary hypofunction. In decreasing order of frequency, symptoms [2–4] of pituitary abscess include: headache without a certain pattern is the most common at 70–90%, anterior pituitary dysfunction at 54–85% due to destruction and necrosis of the gland, central diabetes insipidus at 41–70%, visual disorders 27–50%, and moderate fever 14–33%.

Pituitary abscess [5, 6] accounts for less than 1% of all pituitary lesions and occurs equally in both sexes.
Pituitary abscess may occur de novo or as a result of hematogenous spread or spread from a contiguous focus of infection, such as bacterial meningitis and sphenoiditis. Diagnosis before surgery is usually difficult due to nonspecific presentations and symptoms which mimic other pituitary lesions [7]. Management of pituitary abscess is mainly surgical though some cases have been treated with antibiotics only [8]. In Nigeria, the index case is to the best of our knowledge, the first reported case. It is not clear why this case has not been reported in Nigeria but this may not be unconnected with low index of suspicion. We report the first case of pituitary abscess in Nigeria in a young woman who had primary pituitary abscess, who presented with meningitis like symptoms, and had successful drainage of the abscess.

CASE REPORT

A 16-year-old female presented first to the pediatricians at Children Emergency Room (CHER), with recurrent generalized convulsion, loss of consciousness, fever, general body weakness, and vomiting of few hours duration. At the time of her presentation, her mother gave a history of a prior severe generalized headache and visual impairment that has lasted up to three years. She gave no history of cold intolerance, poor school performance, short stature, polyuria, or polydipsia.

Physical examination revealed an acutely ill, small for age girl who was febrile (temperature 37.8°C), dehydrated, and unconscious with no neck stiffness or other signs of meningeal irritation. Her pupils were dilated but reactive to light, other central nervous system and systemic examinations were essentially normal. A diagnosis of acute bacterial meningitis was considered and she was commenced on empirical antibiotics (intravenous Ceftriaxone 1 g 12 hourly for 10 days). However, the patient had continued bouts of seizures despite being on anticonvulsant. The neurosurgeons, ophthalmologists, and endocrinologists were invited to review: the neurosurgeons suspected a cerebral abscess and requested for a brain CT scan while the ophthalmologist noted a reduced visual field with bitemporal hemianopsia. Brain CT scan was done by the third week of admission.

A diagnosis of pituitary macroadenoma was made. At 18 years (two years after the initial presentation at CHER), she had primary amenorrhea and lacked female secondary sex characteristics (Figure 1).

Investigations

Complete blood count and urine analysis results were normal. Lumbar puncture for cerebrospinal fluid analysis and electroencephalogram were not done on account of financial constraints. Brain CT scan showed widening of the sella turcica and an isodense mass with a well-defined margin (measuring 24.4 × 44 mm) within the sella turcica (Figures 2 and 3). Mass showed ring enhancement in the postcontrast CT. Thus, her endocrine profile results are shown in Table 1.

Treatment

She eventually had a transfrontal craniotomy three years from time of first presentation on 22/5/17 where aspiration of 15 mL of purulent material was done and abscess cavity irrigated with dilute hydrogen peroxide. Culture and sensitivity of the purulent material yielded Listeria sp. sensitive to Moxifloxacin, Cefuroxime, Ceftriaxone, and Chloramphenicol. Ziel Nelson stain for AFB was negative while stains for Cryptococcus, trypanosomes, hyphal elements, yeast elements, or
other fungal elements were negative. Histology of abscess capsule was negative for tuberculosis. She was commenced on steroid replacement therapy (intravenous hydrocortisone 100 mg 8 hourly for 5 days) before surgery based on the laboratory features of hypocortisolism.

**Outcome and follow-up**

One week postsurgery, symptoms of the patient (severe headache and visual impairment) resolved. Follow-up brain CT scan is planned to be done at 3, 6, and 12 months postsurgery. Six weeks after surgery, while on hydrocortisone replacement therapy, her 8 am cortisol was higher than preoperative values (196 mmol/L) now within the reference range (Table 1). Visual field

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**Table 1: Hormone assay results of index patient**

<table>
<thead>
<tr>
<th>Hormone</th>
<th>Results before surgery</th>
<th>Results six weeks after surgery</th>
<th>Reference values</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>2.24 nmol/L</td>
<td>1.78</td>
<td>0.52–1.85</td>
</tr>
<tr>
<td>T4</td>
<td>5.5 nmol/L</td>
<td>5.70</td>
<td>4.8–11.6</td>
</tr>
<tr>
<td>TSH</td>
<td>0.9 mU/L</td>
<td>2.53</td>
<td>0.39–6.16</td>
</tr>
<tr>
<td>LH</td>
<td>6.4 mIU/L</td>
<td>6.72</td>
<td>0.6–10.6</td>
</tr>
<tr>
<td>FSH</td>
<td>3.7 mIU/L</td>
<td>4.20</td>
<td>3.0–7.0</td>
</tr>
<tr>
<td>Prolactin</td>
<td>2.8 mIU/L</td>
<td>2.64</td>
<td>1.2–9.6</td>
</tr>
<tr>
<td>Estradiol</td>
<td>25 ng/L</td>
<td>67</td>
<td>44–196</td>
</tr>
<tr>
<td>8 am cortisol</td>
<td>&lt;1.5 nmol/L</td>
<td>196</td>
<td>171–536</td>
</tr>
</tbody>
</table>

Abbreviations: T3 = tri-iodothyronine, T4 = thyroxine, TSH = thyroid stimulating hormone, LH = luteinizing hormone, FSH = follicle stimulating hormone.
examination was normal and there was no bitemporal hemianopsia.

DISCUSSION

In this case report, we presented a rare case of a Nigerian woman with pituitary abscess presenting with neurological symptoms and who was successfully treated with surgery and antibiotics. She had short stature and hypogonadism as the only endocrine manifestations of the pituitary abscess.

Pituitary abscess is a rare endocrine disorder, first described by Simmonds [9] in 1914. That pituitary abscess is a rare disorder and is supported by the report that between 1914 when Simmonds first described pituitary abscess in a patient and 2012, only 121 cases were reported in the literature [4] world-wide. In the report by Scanarini et al., of the 500 pituitary lesions operated on over a 27-year period, only two were pituitary abscesses [10]. Our patient presented acutely with features of acute meningitis, chronic headache, and visual impairment. This is similar to the report by Domingue and Wilson [11] where fever and meningism were seen in 57% of patients. Like in all the six cases in the series by Jain et al., the index patient presented with headache and visual impairment [5]. Growth hormone deficiency was not established in our patient but she had hypogonadism with normal gonadotrophic hormones. This contrasts with the pooled results of the three case series [2–4] where anterior pituitary dysfunction was second in frequency at 54–85%. Our patient did not have diabetes insipidus, in contrast to findings in the pooled case series where diabetes insipidus occurred in 41–70% of the patients. The laboratory features of hypocortisolism in our patient was in keeping with findings from a case report from Greece [1].

Pituitary abscess [5, 12, 13] arises in one of three ways: primary abscess in which an abscess form in a previously normal pituitary gland, secondary abscess in which there is an underlying pituitary gland lesion such as an adenoma, craniopharyngioma, and Rathke’s cleft cyst, or results from infections from a distant focus (sepsis) or contiguous sources of infection such as meningitis, sphenoiditis, or cavernous sinus infection. Our patient had brain symptoms of mass effects such as headache, visual impairment for three years before presenting acutely with meningitis like symptoms. The possible explanation for this presentation is that of a chronic pituitary abscess from where bacterial infection spread to involve the meninges. Other risk factors [3] for pituitary abscess such as immunosuppression, previous irradiation, or surgical procedures to the pituitary gland were not present in our patient. It has been reported that up to 60% of cases, no obvious reason for the abscess was found [3]. In the index patient, a repeat brain imaging study postsurgery will not only exclude recurrence of abscess but will exclude a preexisting pituitary lesion.

Diagnosis of pituitary abscess is usually difficult before surgery [7] due to nonspecific manifestations and symptoms which mimic other pituitary lesions. Before surgery, our patient was presumed to have pituitary macroadenoma based on the brain imaging study done, necessitating transfrontal craniotomy approach instead of transphenoidal approach. This contrasts with the situation in the instance of the case series of Domingue and Wilson where all seven patients had transsphenoidal surgery (TSS) [11]. As reported by Blackett et al. [14] and Enzmann et al. [15] definite diagnosis of pituitary abscess is done intraoperatively, as happened in the index case where a transfrontal craniotomy was used in anticipation of excising a pituitary macroadenoma.

Pathogens [4, 16] commonly isolated from pituitary abscess include *Staphylococcus* spp. and *Streptococcus* spp., followed by *Neisseria* spp., *Micrococcus*, *Escherichia coli*, *Brucella*, *Salmonella*, *Corynebacterium*, and *Mycobacterium*. In immunosuppressed patients [17–20], *Aspergillus*, *Candida*, and *Histoplasma* are the most frequent pathogens. In the index case, *Listeria* sp. was the isolated organism. According to DelBrutto et al. and Ozgen et al., cases of parasitic pituitary infection have been reported including cysticercosis [21], and echinococcosis [22], respectively.

Computed tomography of pituitary abscess usually shows sellar enlargement with a well-rounded lesion which shows peripheral ring enhancement with contrast. With magnetic resonance imaging (MRI), the features [23] of pituitary abscess are that of a cystic lesion with iso- or hypointense signal on T1W images and iso- or hyperintense signal on T2W images. After contrast (gadolinium) the lesion demonstrated by MRI shows peripheral ring enhancement. Our patient could not afford an MRI study. With such findings after brain imaging studies, the possible radiological differential diagnosis include a pituitary macroadenoma (adenoma more than 10 mm), a metastasis to the pituitary gland, cystic lesions of the gland (e.g., Rathke’s cleft cyst, arachnoid, or dermoid cyst), glioblastoma, or chronic hematoma. In the index case, pituitary macroadenoma was strongly favored to be the diagnosis.

Surgical approaches to the removal or excision of pituitary gland lesions can be via a transsphenoidal access or via open craniotomy. Transsphenoidal surgery has been reported to be safer than the alternative option and has less postoperative side effects. However, as the index patient has a pituitary lesion of considerable size (44 × 27.4 mm), the transsphenoidal approach was not chosen. Our patient’s visual disturbances [2, 3] resolved soon after surgery and this was similar to the reports by Liu et al. and Zhang et al. Craniotomy is more invasive than TSS, and is associated with the complications of bleeding, bacterial meningitis, and longer hospital stay. Our patient had none of these.

Medical management of pituitary abscess involves prolonged parenteral antibiotics (for 4–6 weeks)
posttherapy and pituitary hormones replacement as indicated. At the time of this preliminary report, growth hormone and estrogen replacement have not been started on the index patient but steroid replacement therapy was commenced (with hydrocortisone) based on the laboratory features of hypocortisolism.

CONCLUSION

Pituitary abscess is rare or underdiagnosed in Nigeria. It usually presents initially with neurological or mass effect symptoms and rarely with endocrine manifestations. Diagnosis of pituitary abscess is made at surgery without which pituitary macroadenoma is usually the radiological diagnosis. Outcome of surgery and prolonged parenteral antibiotics treatment is good. This case report highlights the importance of early diagnosis and appropriate management.

REFERENCES


Acknowledgments

The case was presented at the 39th Scientific Conference & Annual General Meeting of Endocrine & Metabolism Society of Nigeria, Coal City, 2017.

Author Contributions

Ezeani IU – Conception of the work, Design of the work, Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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**Guarantor of Submission**
The corresponding author is the guarantor of submission.

**Source of Support**
None.

**Consent Statement**
Written informed consent was obtained from the patient for publication of this article.

**Conflict of Interest**
Authors declare no conflict of interest.

**Data Availability**
All relevant data are within the paper and its Supporting Information files.

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