Primary lymphoma of the pituitary gland: an unusual cause of hemianopia in an immunocompetent patient

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Primary lymphoma of the pituitary gland is an important diagnosis to consider in patients with seemingly inoperable pituitary tumours.

Introduction

Primary central nervous system lymphoma (PCNSL) is an uncommon form of non-Hodgkin's lymphoma that can affect any part of the brain or spinal cord. The progressive refinement of endocrine tests, as well as improvements in and increasing availability of diagnostic imaging, has led to an increasing number of pituitary masses being diagnosed.[1,2] In addition, with the appearance of acquired immunodeficiency syndrome (AIDS) and organ transplantation in the last 30 years, the incidence of central nervous system (CNS) lymphoma is thought to have increased.[2] Recent improved survival rates of patients with AIDS have led to a further increase in primary CNS lymphoma (PCNSL), with an estimated 2.5% of patients with AIDS developing PCNSL.[3] PCNSL of the pituitary gland is an extremely rare form of this disease. In this article we report the case of an immunocompetent patient who presented with hemianopia and headache secondary to a large primary lymphoma of the pituitary gland which was initially thought to represent an inoperable and incurable tumour. A review of other reported cases is presented to establish common features of the disease.

Case report

A 67-year-old woman presented to the Ophthalmology Department with a left visual field defect and headache. Magnetic resonance imaging revealed a pituitary tumour measuring $3.6 \times 3.4 \times 2.85$ cm (Figure 1), extending inferiorly to occupy the sphenoid sinus. Laboratory testing of endocrine function was normal and a staging computerized tomography scan showed no evidence of disease elsewhere. The past medical history included a T1 N1 MO breast cancer. The initial differential diagnosis for this tumour included metastasis, pituitary adenoma and meningioma. Neurosurgical review of the scans concluded that the appearances were that of an inoperable neoplasm. She was referred to the ENT department for a transnasal, trans-sphenoidal biopsy to gain a tissue diagnosis. During surgery the tumour was found to be filling the sphenoid sinus. In addition to a biopsy, debulking of the tumour was carried out. Postoperatively the patient noticed an immediate improvement in her visual field defect and headache. Histological analysis revealed a diffuse, large, high-grade B-cell pituitary lymphoma (Figure 2). A bone marrow biopsy was normal and the patient was treated with four cycles of chemotherapy and stereotactic radiotherapy. She had a complete response to treatment with no signs of recurrence at 15-month follow-up (Figure 3). Postoperative blood tests showed continued normal pituitary function, requiring no hormone replacement.

Discussion

Primary pituitary lymphoma (PPL) is a rare tumour of the pituitary gland, although as discussed is now diagnosed more frequently. The exact cause is unknown but several hypotheses have been suggested. These include a possible

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Figure 1
Magnetic resonance imaging pre-endoscopic transnasal transphenoidal biopsy

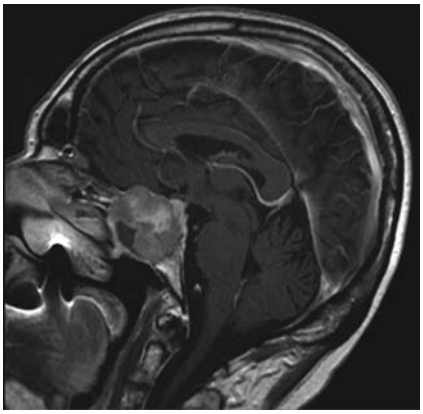
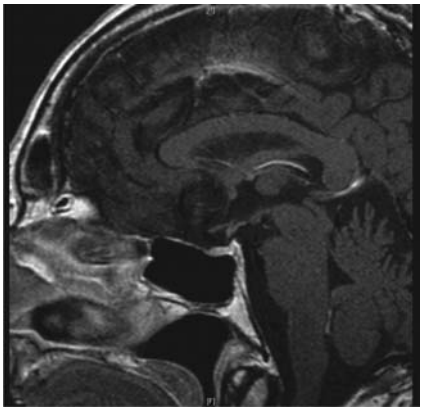


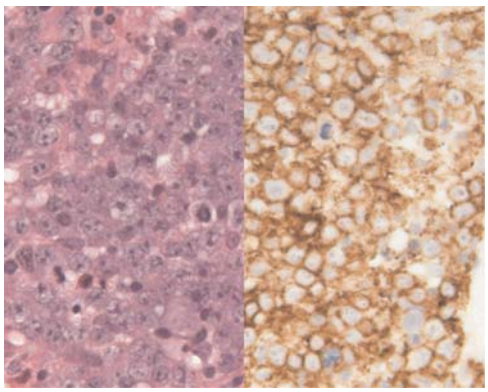
Figure 3
Magnetic resonance imaging post-treatment



infectious aetiology, perhaps due to Epstein–Barr virus or another herpes virus with the transformation of folliculostellate cells (thought to be a form of adult stem cell) into lymphoma cells.[1]

A literature review was performed to search for other reported cases of primary lymphoma of the pituitary gland. A PubMED search was carried out using the MeSH terms (Pituitary Gland OR Pituitary Disease OR Pituitary neoplasm AND Lymphoma). Cases were excluded if the patient was immunosuppressed, or if the lymphoma was widespread. Autopsy studies were not included. This search yielded a total of 27 other reported cases of primary lymphoma of the pituitary gland (Table 1). The majority of these cases were reported in the last 10 years.

Figure 2
Histopathological specimen of tumour. Left slide shows cellular tumour with large vesicular nuclei, prominent nucleoli and mitotic figures (H&E ×400). Right slide shows positive (brown) membrane staining of the tumour cells with an antibody to CD20 (B lymphocyte marker) (×400)



The incidence of PPL seems to be similar in both men and women and most commonly affects patients in the sixth decade, although cases from all age groups have been reported. Endocrine dysfunction, headache and visual symptoms such as decreased acuity and bitemporal hemianopia are the most common presenting features and may be associated with other cranial nerve palsies. Endocrine dysfunction appears to occur in roughly 50% of the studies reviewed in this study.[4,5,8,11,15–17,19,21,23,24,29] Studies of non-functioning pituitary macroadenomas suggest that pituitary dysfunction is present in more than 30%[30] which would correlate well with lymphomas. By far the most common lymphoma subtype reported was B-cell (65%), the other cases were made up of mixed cell, T-cell, Burkitt cell and mucosa-associated lymphoid tissue cell types. The majority of reported cases were treated with radiotherapy, chemotherapy or a combination of the two. It was not possible to estimate survival rates from the literature due to limited follow-up.

Table 1
Summary of other reported cases of primary lymphoma of the pituitary

Author and date	*Patient*	*Cell type*	*Management*	*Outcome*
Li *et al.* (2012)[4]	41♀	B-cell	Surgical resection	
Carrasco *et al.* (2010)[5]	49 ♀	B-cell	Biopsy and chemoradiotherapy	No recurrence at four years
Hayasaka *et al.* (2010)[6]	71 ♂	B-cell		
Bayraktar *et al.* (2010)[7]	47 ♀	B-cell	Endoscopic resection, chemotherapy and stem cell transplantation for recurrence	No recurrence at eight months
Fadoukhair *et al.* (2010)[8]	26 ♀	B-cell	Stereotactic biopsy and steroids	
Moshkin *et al.* (2009)[9]	62 ♂	B-cell	Endoscopic biopsy with partial tumor resection only	Not stated
Quintero Wolfe *et al.* (2009)[10]	45 ♀	B-cell	Sublabial transsphenoidal resection and chemotherapy	No recurrence at three months
Kozáková *et al.* (2008)[11]	60 ♀	B-cell	Neurosurgical intervention	
Romeike *et al.* (2008)[12]	64 ♀	T-cell	Trans-sphenoidal surgery and chemoradiotherapy	No recurrence at 19 months
Rudnik *et al.* (2007)[13]	37 ♂	B-cell	Endoscopic resection, chemoradiotherapy and craniotomy for recurrence	No recurrence at four years
Liu *et al.* (2007)[14]	26 ♂	Mixed cell	Endoscopic biopsy and chemoradiotherapy	Died six months post op (lymphoma)
Huang *et al.* (2005)[15]	47 ♂	Mixed cell	Trans-sphenoidal pituitary resection and chemoradiotherapy	No recurrence at five months
Capra *et al.* (2004)[16]	14 ♀	B-cell	Biopsy through right frontal craniotomy and chemotherapy	No recurrence at 10 months
Katz *et al.* (2003)[17]	64 ♀	B cell	Craniotomy performed after biopsies	
Stephens *et al.* (2002)[18]	79 ♀	B-cell	Craniotomy performed after biopsies and radiotherapy	Died soon after treatment
Kaufmann *et al.* (2002)[19]	74 ♂	B-cell	Trans-sphenoidal pituitary resection and radiotherapy	Died soon after treatment
Kaufmann *et al.* (2002)[15]	65 ♂	B-cell	Trans-sphenoidal pituitary resection, stereotactic radiosurgery, chemotherapy and bone marrow transplantation for recurrence	Died seven months postsurgery (pulmonary failure)
Lee *et al.* (2002)[20]	42 ♂	MALT	Endoscopic trans-sphenoidal surgery and chemotherapy	No recurrence after six months
Landman *et al.* (2001)[21]	86 ♀:	B-cell	Trans-sphenoidal resection and chemotherapy	died three months after diagnosis
Baleydier *et al.* (2001)[22]	9 ♂	B-cell	Diagnosis made on lumbar puncture and treated with chemotherapy	No recurrence at one year
Silfen *et al.* (2001)[23]	11 ♂	Burkitt cell	Biopsy of the lesion and chemotherapy	No recurrence at 17 months
Mathiasen *et al.* (2000)[24]	65 ♂	B-cell	Endosopic transnasal transsephenoidal and chemotherapy	
Au *et al.* (2000)[25]	82 ♂	B-cell	Trans-sphenoidal biopsy and palliative radiotherapy	

(Continued)

Table 1
Continued

Author and date	*Patient*	*Cell type*	*Management*	*Outcome*
Kuhn *et al.* (1999)[26]	67 ♀	T-cell	Sublabial transsphenoidal resection and radiotherapy	
Sakakibara *et al.* (1998)[27]	53 ♂	T-cell	Transsphenoidal surgery and radiotherapy	
Shaw *et al.* (1997)[28]	73 ♀	Mixed cell	Transsphenoidal exploration and radiotherapy	No recurrence at 21 months
Samaratunga *et al.* (1997)[29]	66 ♂	MALT-cell	Endosopic resection and radiotherapy	

MALT, mucosa-associated lymphoid tissue

Conclusion

Otorhinolaryngologists involved in the treatment of pituitary tumours should be aware of this disease as it is increasing in incidence. It is particularly important to consider the diagnosis in cases that are labelled as inoperable.

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