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 × 3.4 × 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...
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.

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.⁴,⁵,⁸,¹¹–¹⁷,¹⁹,²¹,²³,²⁴,²⁹ 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.

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| Author and date            | Patient | Cell type | Management                                                                 | Outcome                                           |
|---------------------------|---------|-----------|-----------------------------------------------------------------------------|---------------------------------------------------|
| Li et al. (2012)\(^a\)   | 41♀     | B-cell    | Surgical resection                                                          | No recurrence at four years                       |
| Carrasco et al. (2010)\(^5\) | 49♀     | B-cell    | Biopsy and chemoradiotherapy                                                |                                                  |
| Hayasaka et al. (2010)\(^6\) | 71♂     | B-cell    | Endoscopic resection, chemotherapy and stem cell transplantation for recurrence | No recurrence at eight months                     |
| Bayraktar et al. (2010)\(^7\) | 47♀     | B-cell    | Stereotactic biopsy and steroids                                             |                                                  |
| Fadoukhair et al. (2010)\(^8\) | 26♀     | 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                     |
| Kožáková 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                                         | Died soon after treatment                        |
| 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 seven months post surgery (pulmonary failure) |
| Kaufmann et al. (2002)\(^20\)         | 65♂     | B-cell    | Trans-sphenoidal pituitary resection, stereotactic radiosurgery, chemotherapy and bone marrow transplantation for recurrence | Died nine months after surgery (pulmonary failure) |
| Lee et al. (2002)\(^20\) | 42♀     | MALT      | Endoscopic trans-sphenoidal surgery and chemoradiotherapy                   | No recurrence after six months died three months after diagnosis (pulmonary failure) |
| Landman et al. (2001)\(^21\)         | 86♂     | B-cell    | Trans-sphenoidal resection and chemotherapy                                | No recurrence at one year                         |
| Baleydier et al. (2001)\(^22\)       | 9♂      | B-cell    | Diagnosis made on lumbar puncture and treated with chemotherapy             | No recurrence at 17 months                       |
| Silfen et al. (2001)\(^23\)          | 11♂     | Burkitt cell| Biopsy of the lesion and chemotherapy                                       |                                                   |
| Mathiasen et al. (2000)\(^24\)       | 65♀     | B-cell    | Endoscopic transnasal transsphenoidal and chemoradiotherapy                |                                                   |
| Au et al. (2000)\(^25\)             | 82♂     | B-cell    | Trans-sphenoidal biopsy and palliative radiotherapy                        |                                                   |
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Table 1

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