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Solitary plasmacytoma and extramedullary plasmacytoma of the paranasal sinuses and soft palate

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Abstract
Solitary plasmacytoma of the paranasal sinuses are uncommon neoplasms of B lymphocyte origin. They comprise one per cent of all head and neck tumours of the upper respiratory tract. They can be solitary plasmacytomas of the bone (SPB), an extramedullary plasmacytoma or a local manifestation of multiple myeloma. Conversion to multiple myeloma happens more frequently in SPB. Radiotherapy is the common modality of treatment with, or without, adjuvant chemotherapy. Extramedullary plasmacytoma carries a better prognosis than a solitary plasmacytoma of the bone. We report four cases of solitary plasmacytoma of the bone and an extramedullary plasmacytoma of the paranasal sinuses and soft palate.

Key words: Plasmacytoma; Paranasal Sinuses

Introduction

Solitary plasmacytomas of the parnasal sinuses are uncommon and of B lymphocyte origin.[1] The diagnostic classification of plasma cell neoplastic disorders include a) solitary plasmacytoma of the bone, b) extramedullary plasmacytoma (EMP), c) myelomatosis and d) plasma cell leukaemia. Extramedullary plasmacytoma accounts for up to three per cent of all plasma cell tumours.[2] These tumours are four times more common in men in their sixth to eight decade of life.[3] Eighty per cent of plasmacytomas are found in the head and neck region commonly affecting the nasal cavity, paranasal sinuses, tonsillar fossa and oral cavity.[1] Involvement of the local lymph nodes occurs in 10 to 20 per cent. It is debatable whether plasmacytomas are a distinct pathological entity or an early manifestation of plasmacytic dyscrasias.[4,5]

Solitary plasmacytomas of bone originate from plasma cells in the bone marrow. The femur, pelvis and the spine are the most commonly involved sites for SPB. Solitary plasmacytoma of the bone commonly presents as a single large osteolytic lesion, often with multi-cystic areas of rarefaction. They lack the characteristic sharp demarcation found in the bony lesions of multiple myeloma.[2] Conversion to multiple myeloma happens more frequently in SPB. It has been reported that 48 per cent of SPB will convert to multiple myeloma.[6] Tumours with expression of the lambda chain are more prone to evolve in to myeloma.[7] The presence of 10 per cent or more plasma cells are in the bone marrow biopsy and involvement of multiple sites indicate a predisposition towards transformation to multiple myeloma. It may take many years for a solitary plasmacytoma to convert to myeloma. Some authors have suggested that SPBs are, in fact, an evolving multiple myeloma.[8] Skeletal spread of the disease is seen in up to 50 per cent of cases within the first five years.[2] The overall survival time of 10.7 years and an overall median survival time of 47 months have been reported by Chak *et al.*[9] The long-term prognosis in patients with SPB is poorer than in patients with EMP.

Case reports

Case 1

A small lesion on the soft palate close to the uvula was found incidentally, on examination of a 54-year-old male. An excisional biopsy was carried out under general anaesthesia.

Histopathology showed islands of tumour plasma cells on the background of amyloid stroma. Atypical plasma cells with k-light chain restriction were demonstrated. There was no paraprotein on serum electrophoresis and the urine was negative for Bence Jones protein. Bone marrow biopsy and isotope bone scan was negative. The diagnosis was extramedullary plasmacytoma.

The patient received field radiotherapy to his soft palate and nasopharynx, and has remained asymptomatic and disease-free for more than one year.

Case 2

A 53-year-old female presented with gradual loss of vision and protrusion of her right eye. She also had recurrent nosebleeds, and a blocked right nostril with complete loss of smell. On examination she had a non-axial proptosis of her right eye with reduced vision and a massive right intranasal mass.

Computed tomography (CT) scan revealed a mass centred on the right maxillary sinus. The lesion was biopsied endoscopically. Light microscopy demonstrated strong cytoplasmic staining for the plasma cell marker, v538. These cells showed immunoglobulin expression with light chain restriction. The diagnosis was poorly differentiated extramedullary plasmacytoma.

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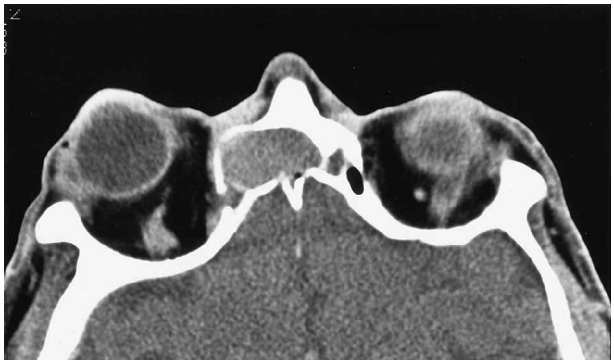

FIG. 1

Coronal CT scan of the orbits and the para-nasal sinuses showing tumour involving right ethmoid and frontal sinus with orbital and intracranial extensions.

The patient received five cycles of chemotherapy (CHOP) followed by radiotherapy to the right maxillary antrum, nasal cavity and the right orbit. She remains disease free.

Case 3

A 64-year-old male presented with a painless, slowly growing lump close to his right medial canthus of six months duration. On examination he had a soft, non-tender mass close to the medial side of his right eye, which was displaced laterally by 4 mm. Previously he had had radiotherapy for solitary plasmacytoma of his sternum.

CT scan revealed a soft tissue mass originating from the right ethmoid sinus extending into the cranial cavity and the frontal sinus (Figure 1). His bone marrow biopsy was normal and isotope bone scan did not reveal any skeletal lesion. He had traces of light chain paraprotein in his urine. A clinical diagnosis of recurrent solitary plasmacytoma of bone was made.

He received chemotherapy followed by local radiotherapy. The orbito-nasal swelling regressed completely. He was disease free two years post-chemo-radiotherapy.

Case 4

A 45-year-old male presented with a history of intermittent epistaxis and a blocked nose for over one year mainly from his left nostril. Examination of his postnasal space revealed a large mass.

A CT scan showed a large tumour arising from the postnasal space on the left side (Figure 2). His bone marrow biopsy and skeletal survey was negative. Traces of Bence Jones protein were detected in his urine. He was examined under anaesthesia and a biopsy of the tumour was performed. The histopathological report confirmed the diagnosis of extramedullary plasmacytoma.

He received radical radiotherapy to his nasopharynx and his left tonsillar region. No urinary paraprotein was demonstrated post-radiotherapy, and he remains well after 18 months.

Discussion

Extramedullary plasmacytoma have a predilection for the paranasal sinuses and nose. Up to 80 per cent of the EMP of the head and neck region arise from the submucosa of the upper aerodigestive tract. Solitary plasmacytoma of the bone rarely affect the facial skeleton.[2] These tumours are more common in bones with medullary compartments. One of the four cases reported here was diagnosed to be a

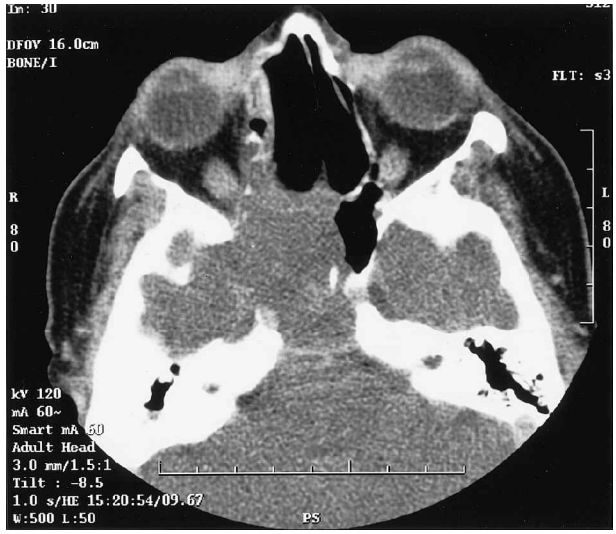

FIG. 2

A CT scan showed a large tumour arising from the postnasal space on the left side.

recurrent SPB. This was a 64-year-old man who presented with a slowly growing non-tender mass close to his medial canthus. This patient previously had had radiotherapy for SPB of the sternum. A CT scan revealed a soft tissue tumour of ethmoid sinus origin. Dissemination of the tumour, local recurrence and myeloma conversion are all more common in SPB. Local recurrence has been reported to be up to 10 per cent in these neoplasms.

Extramedullary plasmacytoma arise from monoclonal expansion of sub-mucosal plasma cells. The upper aerodigestive tract has a high predilection and comprise one per cent of all head and neck tumours and four per cent of all non-epithelial tumours of the upper respiratory tract.[4,10] The reported conversion rate of extramedullary plasmacytoma to multiple myeloma is 15 to 20 per cent and is associated with a poorer prognosis. Dissemination of the tumour takes place in 35 to 50 per cent of EMPs.[11] The clinical nasal features associated with these neoplasms are the presence of a blocked nose, a soft tissue mass, epistaxis, nasal discharge, pain, proptosis, regional lymphadenopathy and rarely a cranial nerve palsy.[1] EMP can erode bone making it difficult to distinguish it from SPB. It needs to be distinguished from plasma cell granuloma, pseudolymphoma, reactive plasmacytic hyperplasia[12–14] and malignant tumours such as olfactory neuroblastoma, lymphoma, anaplastic carcinoma, haemapoietic malignancy and metastatic tumours.[15,16] The prognosis for patients with EMP is that more than 50 per cent of EMP patients survive beyond 10 years.[4]

The diagnosis of plasmacytoma is based on histology, and its specific immunoglobulin secretor type can be determined by immunocytochemistry. The deposition of amyloid in the stroma, although a feature, is not a diagnostic finding. Amyloid is expressed by 15 to 38 per cent of extramedullary plasmacytoma as reported by Sulzner *et al.*[17] The diagnosis of solitary plasmacytoma must be made after careful exclusion of the simultaneous presence of other plasma cell tumours by a negative bone scan and a normal bone marrow aspiration study. The histopathological diagnostic criterion laid down by Knowling *et al.*[6] requires an absence of neoplastic plasma cells in the bone marrow biopsy although Corwin *et al.*[18] and Mendelhall *et al.*[19] would accept the presence of up to 10 per cent of plasma cells in the bone marrow biopsy. Detection of myeloma protein in serum and Bence Jones

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protein in urine is uncommon in solitary plasmacytoma. A monoclonal band of serum protein is expressed by approximately 25 per cent of EMPs at an early stage. The commonest immunoglobulin expressed by the tumour cells is IgG with kappa chain restriction.[8] Solitary plasmacytoma may not be associated with detectable myeloma protein in serum, when the tumour is small. Tumours expressing the immunoglobulin IgG are least likely to convert to multiple myeloma and carry a better prognosis. The re-appearance of myeloma proteins in patients serum or urine after radiotherapy usually indicates disease recurrence. Plasmacytoma can be graded low (grade 1), intermediate (grade 2) and high grades (grade 3) on the basis of cellular atypia.[3] Neoplastic cells in the grade 1 are indistinguishable from their normal counterparts. On the other hand grade 3 tumours will have plasmablastic type cells. The expression of a specific type of monoclonal antibody, local destruction of bone, SPB, early dissemination, conversion to multiple myeloma and the pathological grade of tumour have all been reported as prognostic factors. Of all these criteria the pathological grade of tumour is probably the most significant prognostic variable.[1,3] Poorly differentiated tumours, therefore, have a high recurrence rate and poor five-year-survival.

Extramedullary plasmacytoma are highly radiosensitive.[1] Radiotherapy, therefore, is the treatment of choice. Adjuvant chemotherapy is sometimes indicated in an attempt to delay the conversion to myeloma. Surgical excision of the tumour is not common practice. We have reported three cases of EMPs. They originated from the soft palate, maxillary antrum and the nasopharynx. These tumours are highly radiosensitive.[1] Mendehall *et al.*[19] have reported 94 per cent local control rate in solitary plasmacytoma with doses exceeding 40 Gy in four weeks. Susnerwala *et al.*,[3] on the other hand, have suggested administration of 35–45 Gy in three weeks for low grade solitary plasmacytoma. Adjuvant chemotherapy has been reported to prolong survival in patients with recurrence or myeloma conversion.[20] Use of chemotherapeutic agents as adjuvant treatment have been proposed by Kapadia *et al.*[1] for large and poorly differentiated plasmacytoma which are associated with a poorer prognosis. The use of alkylating chemotherapy in locally invasive tumours is preferred by some authors.[21] Adjuvant chemotherapy has been claimed to prolong survival and delays conversion to myeloma. Two out of the three cases of EMP reported here achieved disease-free status with radiotherapy. One patient, who presented with a large tumour arising from the maxillary antrum with proptosis and loss of vision, had a poorly differentiated plasmacytoma. She received five cycles of chemotherapy (CHOP) before local radiotherapy. She remains disease free.

The presence of paraprotein in the serum or blood is common but not a constant finding in solitary plasmacytoma. One out of the four cases, had traces of Bence Jones protein in their urine. This patient had a large neoplasm with high tumour burden. No urinary paraprotein was detected in this patient post-radiotherapy. The re-appearance of paraprotein after treatment usually indicates recurrence or myeloma conversion. The patient's prognosis depends on various factors i.e. type of plasmacytoma, tumour burden, synchronous tumours, specific immunoglobulin expression, presence of signs of dissemination, myeloma conversion and pathological grade of tumours. Dissemination of tumour may occur in EMPs after many years of disease-free state. Between 30–50 per cent of EMP will show late dissemination. Pathological grades of tumours based on the degree of differentiation of the plasma cells are probably an important prognostic indicator. Poorly differentiated tumours are usually associated with a worse prognosis.[1]

Summary

The natural history of different plasmacytic tumours is variable. Patients with solitary tumours are often treated with radiotherapy and have a good long-term survival. However, chemotherapy is sometimes necessary, when there is recurrence, dissemination or conversion to myeloma.

All solitary plasmacytoma require long-term follow up with repeat of measurement of myeloma protein. Detection of myeloma proteins in the patient's serum or urine indicates new disease, recurrence or conversion to multiple myeloma. Measurement of paraprotein is, therefore, an important aid to assess disease control. Extramedullary plasmacytoma, solitary plasmacytoma and multiple myeloma may represent a different spectrum of the same disease.

References

1 Kapadia SB, Desai U, Cheng VS. Extramedullary plasmacytomas of the head and neck. A clinicopathologic study of 20 cases. *Medicine* 1982;**61**:317–29
2 Batsakis JG. Plasma cell tumours of the head and neck. *Ann Otol Rhinol Laryngol* 1983;**92**:311–3
3 Susnerwala SS, Shanks JH, Banerjee SS, Scarffe JH, Farrington WT, Slevin JN. Extramedullary plasmacytoma of the head and neck region: clinicopathological correlation in 25 cases. *Br J Cancer* 1997;**75**:921–7
4 Wiltshaw E. The natural history of extramedullary plasmacytoma and its relation to solitary myeloma of bone and myelomatosis. *Medicine* 1976;**55**:217–38
5 Webb HE, Harrison EG, Mason JK. Solitary extramedullary myeloma (plasmacytoma) of the upper part of the respiratory tract and oropharynx. *Cancer* 1962;**15**:1142–55
6 Knowling MA, Harwood AR, Bergsagel DE. Comparison of extramedullary plasmacytomas with solitary and multiple plasma cell tumours of the bone. *J Clin Oncol* 1983;**1**:255–62
7 Holland J, Trenkner DA, Todd H, Fineberg B. Plasmacytoma – treatment results and conversion to myeloma. *Cancer* 1992;**69**:1513–7
8 Mock PM, Neal GD, Aufdemorte TB. Immunoperoxidase characterization of extramedullary plasmacytoma of the head and neck. *Head Neck Surg* 1987;**9**:356–61
9 Chak LY, Cox RS, Bostick DG, Hoppe RT. Solitary plasmacytoma of bone: treatment, progression and survival. *J Clin Oncol* 1987;**5**:1811–5
10 Fu YS, Perzin KH. Nonepithelial tumours of the nasal cavity, paranasal sinuses and nasopharynx. A clinicopathological study. IX. Plasmacytomas. *Cancer* 1978;**42**:2399–406
11 Wanebo H, Geller W, Gerold F. Extramedullary plasmacytomas of the upper respiratory tract. Recurrence after latency of thirty-six years. *N Y State J Med* 1966;**66**:1110–13
12 Bahadori M, Leibow AA. Plasma cell granuloma of the lung. *Cancer* 1973;**31**:191–208
13 Holck S. Plasma cell granuloma of the thyroid. *Cancer* 1981;**48**:830–2
14 Kelly AG, Rosas-Uribe A, Kraus ST. Orbital lymphoma and pseudolymphoma. A clinicopathologic study of eleven cases. *Am J Clin Pathol* 1977;**68**:377–86
15 Kapadia SB, Barnes L, Deutsch M. Non-Hodgkin's lymphoma of the nose and paranasal sinuses. *Head Neck Surg* 1981;**3**:490–9
16 Macpherson TA, Dekker A, Kapadia SB. Thyroid gland plasma cell neoplasm (plasmacytoma). *Arch Path Lab Medicine* 1981;**105**:570–2
17 Sulzner SE, Amdur RL, Weider DJ. Extramedullary plasmacytoma of the head and neck. *Am J Otolaryngol* 1998;**19**:203–8

18 Corwin J, Lindberg RD. Solitary plasmacytoma of bone *vs* extramedullary plasmacytoma and their relationship to multiple myeloma. *Cancer* 1979;**43**:1007–13
19 Mendelhall WM, Thar TL, Million RR. Solitary plasmacytoma of bone and soft tissue. *Int J Radiat Oncol Biol Phys* 1980;**6**:1457–501
20 Sporn JS, McIntyre DR. Chemotherapy of previously untreated multiple myeloma patients: An analysis of recent treatment results. *Semin Oncol* 1986;**13**:318–25
21 Soesan M, Paccagnella A, Chiarion-Sileni V, Salvagno L, Fornasiero A, Scotti G *et al*. Extramedullary plasmacytoma: clinical behaviour and response to treatment. *Ann Oncol* 1992;**3**:51–7

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