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Isolated extramedullary plasmacytoma of the true vocal fold

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Abstract
We report a rare case of isolated extramedullary plasmacytoma (EMP) of the right true vocal fold in a 38-year-old male with a one-year history of hoarseness. Immunohistochemical staining of plasma cells in the tumour, showed over 90 per cent of them to be positive for kappa light chains. After two attempts at local surgical excision and recurrence within 10 months, the tumour was irradiated.

Only seven reported cases of isolated EMP of the true vocal fold are reported in the literature. The therapeutic options are discussed.

Key words: Plasmacytoma; Larynx

Introduction

Plasma cell tumours usually involve the bone marrow in a diffuse fashion (multiple myeloma). Uncommonly a tumour may be localized to the bone (solitary plasmacytoma of the bone) or to soft tissue (extramedullary plasmacytoma EMP). They can produce a serum paraprotein or excess light chains usually detected in the urine. The monoclonal nature of the tumour cells may be confirmed immunohistochemically by finding the expression of kappa or lambda light chains associated with them.[1]

Extramedullary plasmacytoma (EMP) can present as a solitary lesion or be part of a disseminated disease process. These can occur almost anywhere in the body, such as in the airway passages, gastrointestinal tract or soft tissues.[2] Approximately 80 per cent of solitary EMP occur in the head and neck but they represent fewer than one per cent of all head and neck tumours.[1] Most cases occur in the nasal cavity, sinuses, nasopharynx and oropharynx.[3] Solitary EMP of the larynx is very rare: up to 1990 there were only 73 cases reported in the world literature.[4] Nowak-Sadzikowska and Weiss[5] added five cases. Pahor[6] found 30 cases in a review of the literature. The most commonly involved site that Pahor reported was the epiglottis. He found only two cases reported in the literature, with isolated EMP on the true vocal folds.

In view of the rarity of the lesion, a case of solitary EMP of the true vocal folds is presented and the therapeutic options discussed.

Case report

The patient was a 38-year-old male who presented with a one-year history of slight hoarseness and the feeling of a foreign body in his throat. He had no dysphagia or dyspnoea and had no previous medical history. Direct laryngoscopy under general anaesthesia was performed and a white non-raised lesion was found on the right true vocal fold. Signs of chronic inflammation were found on histological examination.

After five months he presented again with hoarseness. A large polyp was found on the right true vocal fold on direct laryngoscopy which was excised. Histological examination again showed chronic inflammatory changes and a collection of mature plasma cells (Figure 1). Immunohistochemical staining showed over 90 per cent of these cells to stain for kappa light chains and less than 10 per cent positive for lambda chains (Figure 2), thus confirming their monoclonality, as described by Hyams *et al.*[8]

Serum protein electrophoresis was normal with no evidence of paraprotein. Urine examination for light chains was negative. Levels of IgG, IgA, IgM and B_2 microglobulin in the serum were within the normal range. The full blood count and levels of serum calcium,

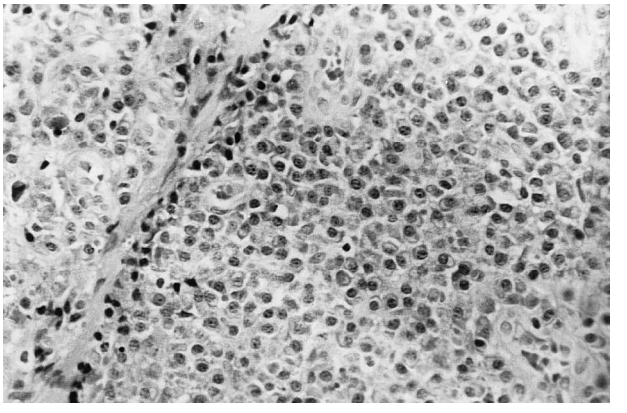

Fig. 1
Section of the tumour with a uniform sheet of mature plasma cells showing typical nuclear and cytoplasmic features (H&E; ×250).

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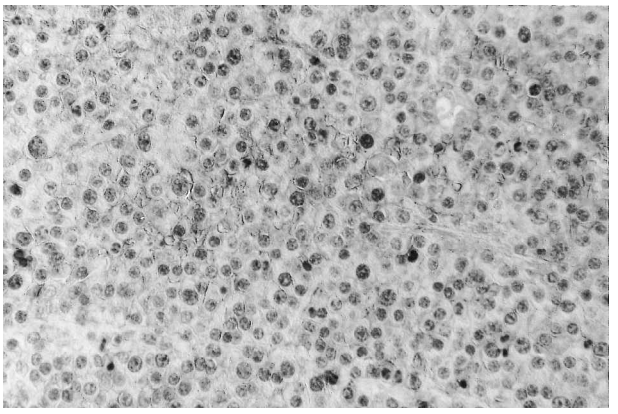

FIG. 2

Immunohistochemical staining of section of the tumour with over 90 per cent of plasma cells staining for kappa light chains (DPC's ImmuStain kappa light chain polyclonal rabbit primary antibody; ×250).

creatinine and uric acid were within the normal range. Bone marrow was aspirated from the sternum which was normal on cytological examination and showed no evidence of plasma cell infiltration. A radiological skeletal survey was performed which showed no evidence of lytic lesions in the skull, vertebral column or bones of the chest wall or pelvis. After another five months and further complaints of hoarseness, a repeat direct laryngoscopy showed again a white lesion on the right true vocal fold.

Histological examination of the excised material on this occasion did not show a plasma cell infiltrate, but only connective tissue lined by normal squamous epithelium.

Local recurrence two times within 10 months, made us feel that the tumour was not completely removed and that the process might be deeper than the biopsy. Because of this, the larynx was irradiated with 5000 cGy. Since then, after a further follow-up of three years, the lesion has not recurred.

Discussion

The clinical appearance of EMP in the larynx is not specific. The most common symptom is slowly progressive hoarseness. Late symptoms are dysphagia, stridor and pain associated with locally aggressive tumours.[8] EMP of the larynx arises in the submucosa and presents as a polypoid, unilateral, smooth sessile mass with no ulceration.[9]

Diagnosis from a clinical point of view can only be suspected and is ultimately made by histological examination. Once a diagnosis of EMP is made, a systemic investigation should be carried out in order to rule out other lesions or multiple myeloma. The histological appearance of EMP consists of a monoclonal proliferation of plasma cells set in a very sparse matrix. Cellular and nuclear atypia may be minimal or prominent.[10] As EMP arises from a monoclonal proliferation of plasma cells, it is necessary to distinguish EMP from a reactive increase in plasma cells by immunohistochemical techniques.[1] With a reactive plasmacytosis, kappa and lambda light chains would be equally represented but with an EMP, one type of light chain would predominate. Additionally, in chronic inflammation, other cells such as lymphocytes, as well as plasma cells, are found.[11]

In this present case, the definitive diagnosis was made by immunohistochemical examination (Figure 2). Although the plasma cells did not reveal any abnormal mitotic figure or atypicality, the uniformity of the plasma cells and the homogenous appearance, suggested tumour growth. The immunohistochemical finding also supported a malignant process.

Three therapeutic modalities are possible:

(1) local surgical excision of the tumour;
(2) external irradiation of the larynx;
(3) major surgery of the larynx.

The literature was reviewed for therapeutic options in this rare condition. Only seven cases of isolated EMP of the true vocal folds have been reported (Table I).

Gorenstein *et al.*[12] reported six cases of EMP of the larynx in Mayo Clinic patients (1949–1974). Only one had an isolated EMP of the true vocal folds. This case underwent vocal fold stripping and after a follow-up of five years, no evidence of disease was found. Ringertz[13] reported one case of glottic EMP, treated by irradiation. Webb *et al.*[14] described 19 cases of EMP of the upper respiratory tract. One case had EMP of the right vocal fold. He underwent surgical removal without evidence of recurrence after 11 years.

Nowak-Sadzikowska and Weiss[5] reported five cases of EMP of the larynx, of which, two had EMP of the glottis. They were treated with external irradiation of 60 GY and

TABLE I
REPORTED CASES OF TRUE VOCAL FOLDS EXTRAMEDULLARY PLASMACYTOMA

Patient Age (yr) Sex	Author	Symptoms	Site	Treatment	Follow-up
1/42/M	Gorenstein *et al.*,[12]	Hoarseness (6 months)	Both true folds	Surgery: fold stripping	5 years; no evidence of disease
2/59/M	Ringertz[13]	Hoarseness (4 months)	Left vocal fold	Radiotherapy	4 years: no evidence of disease
3/55/F	Webb *et al.*,[14]	Hoarseness (3 months)	Right vocal fold	Surgical removal and cautery of base	11 years; no evidence of recurrence
4/50/M	Nowak-Sadzikowska and Weiss[5]	Hoarseness	Glottis	Irradiation 60 GY	10 years; no evidence of disease
5/48/M	Nowak-Sadzikowska and Weiss[5]	Hoarseness	Glottis	Irradiation 60 GY	10 years; no evidence of disease
6/54/F	Gadomski *et al.*,[15]	Hoarseness (6 weeks)	Glottis	Total laryngectomy and left radical neck dissection followed by chemotherapy	Died 15 years later (Reported tumour-free)
7/43/M	Kost[8]	Hoarseness (3 months)	Left true vocal fold	Irradiation 7000 cGY	Laryngectomy 9 months later for radionecrosis 7 years no evidence of disease.

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were free of disease after a follow-up of 10 years. Gadomski *et al.*[15] described one case of glottic EMP who underwent total laryngectomy and left radical neck dissection followed by chemotherapy and died 15 years later but tumour free. Kost[8] reported four cases of EMP of the larynx, of which, one had a glottic EMP. This patient received 7000 cGy irradiation and underwent total laryngectomy nine months later for radionecrosis. In a follow-up of seven years, no evidence of recurrence was found.

There is more information in the literature about treatment of cases of EMP in sites other than the larynx. Helmus[16] reviewed the results of all head and neck EMP treatment by surgical excision, irradiation therapy or the combination of the two and concluded that there were no statistically significant differences. Horny and Kaiserling[1] and Bjelkenkrantz *et al.*[17] suggest that small localized lesions in the larynx, are best treated by surgery. Larger lesions, however, necessitating major surgery, are best treated by radiotherapy. Major surgery as a treatment in EMP of the larynx was suggested by Gadomski *et al.*[15] Kost,[8] Mochimatsu *et al.*[18] and by Rodriguez-De-Velasquez *et al.*[9] Mochimatsu *et al.*[18] had a patient with laryngeal EMP who underwent total laryngectomy followed by radiotherapy, he had a recurrence of 12 years later. Rodriguez-De-Velasquez *et al.*[9] recommended a partial or total laryngectomy in cases where the lesion invades the cartilage of the larynx.

In the present case, we tried to remove the tumour by local surgical excision alone, but after local recurrence two times within 10 months, external irradiation was added. In a follow-up of three years after this irradiation therapy, there has been no evidence of recurrence.

Although the outlook of EMP of the larynx is much better than cases of multiple myeloma with laryngeal involvement, the prognosis remains uncertain.[11]

In solitary bone plasmacytoma 44 to 69 per cent of patients will develop multiple myeloma within a median time of three years.[19] The prognosis of EMP is better. There is a local relapse rate of less than 10 per cent, a regional relapse rate of eight to 15 per cent at 10 years and a 40 per cent final progression to multiple myeloma.[20] These patients must therefore be submitted to life-long follow-up.

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