PRIMARY SEBACEOUS CARCINOMA OF LACRIMAL GLAND: A PREVIOUSLY UNREPORTED PRIMARY NEOPLASM

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SUMMARY

We describe a patient who presented with a rapidly growing neoplasm of the lacrimal gland which histologically was a sebaceous gland carcinoma. The eyelid was entirely normal on examination under anaesthesia. Sebaceous differentiation has been described on only three previous occasions, arising within pre-existing tumours of the lacrimal gland such as pleomorphic adenoma. In this case there is a single tumour cell line within normal lacrimal gland, and the eyelid is normal. This points to a previously unreported diagnosis of primary sebaceous carcinoma of the lacrimal gland.

CASE REPORT

A 76-year-old Caucasian man, a retired miner, presented to another unit in May 1992, complaining of vague discomfort in his left eye. He was found to have an inflamed pinguecula but no other physical signs. In August 1992 he re-presented with a 6 week history of horizontal diplopia with severe pain in his orbit. At that time he was thought to have both sixth and third nerve palsies, without evidence of proptosis. A CT scan was performed which showed a mass in close proximity to his lacrimal gland, and he was referred to this unit for further evaluation.

On presentation the visual acuities were 6/6 right and 6/9 left. There was no afferent pupillary defect. Non-axial proptosis was apparent, with a mass palpable in the left upper quadrant beneath the orbital rim. No pre-auricular or cervical lymph nodes were palpable. The horizontal and vertical movements of the left eye were severely restricted. The patient was admitted for investigation and orbital biopsy. He had a long history of controlled myelodysplastic syndrome, with an associated thrombocytopenia, and simple coalminer's pneumoconiosis confirmed on chest radiograph, but no evidence of malignancy.

The CT scan (Fig. 1) demonstrates the presence of a large, solid, heterogeneous lesion containing small foci of calcium, occupying the lateral aspect of the orbit. The appearances are consistent with an infiltrative tumour of the lacrimal gland. There is bony hyperostosis and invasion adjacent to the mass.

We performed a lacrimal gland biopsy with the patient under local anaesthetic, approaching the anterior orbit through the upper lid skin crease. The orbital septum was identified and incised, to reveal a large nodular lesion immediately behind the septum, which was biopsied. The upper lid was normal (Fig. 2), and no lymph nodes were palpable. After surgery there was persistent haemorrhage from the wound due to the patient's thrombocytopenia, requiring transfusion of 4 units of platelets.

In view of the patient's age and poor physical condition, he was treated with palliative analgesia. He died suddenly and unexpectedly 4 weeks later from bronchopneumonia. An autopsy was not performed.

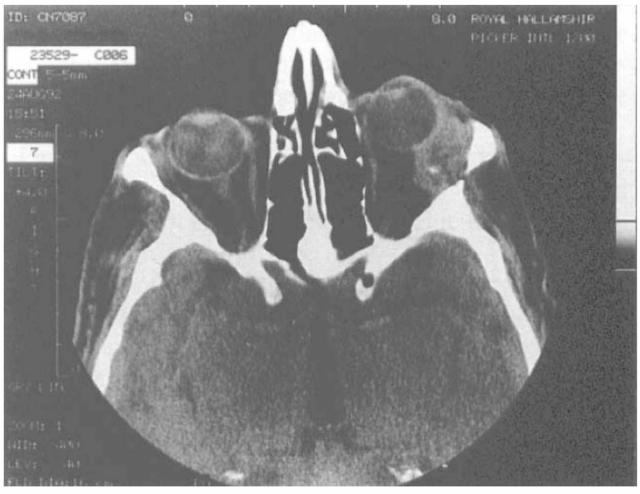

Fig. 1. *CT scan with contrast showing a heterogeneous mass in the region of the lacrimal gland causing proptosis of the left eye. The mass has a calcific focus and is causing erosion of adjacent bone.*

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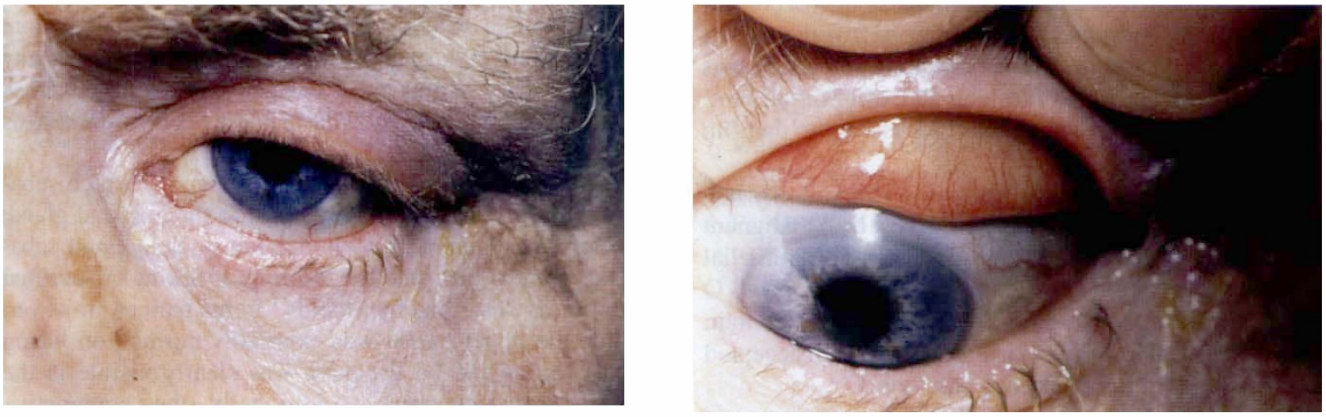

Fig. 2. *Post-operative appearances of left upper eyelid. Apart from mild bruising and swelling, the eyelid skin, lid margin and tarsal plate are all normal.*

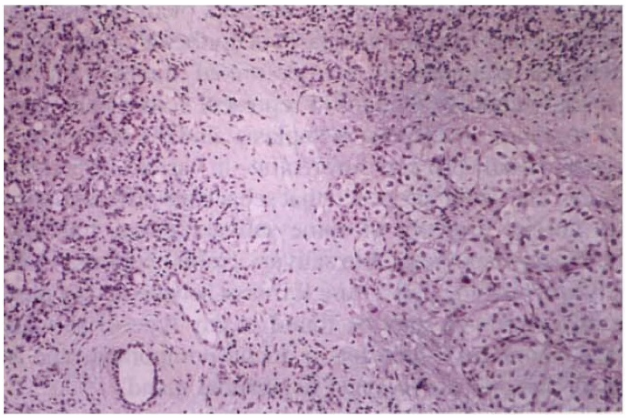

Fig. 3. *Lacrimal gland tissue is infiltrated by nests and sheets of pleomorphic sebaceous carcinoma cells (bottom right). Haematoxylin & eosin. (×80)*

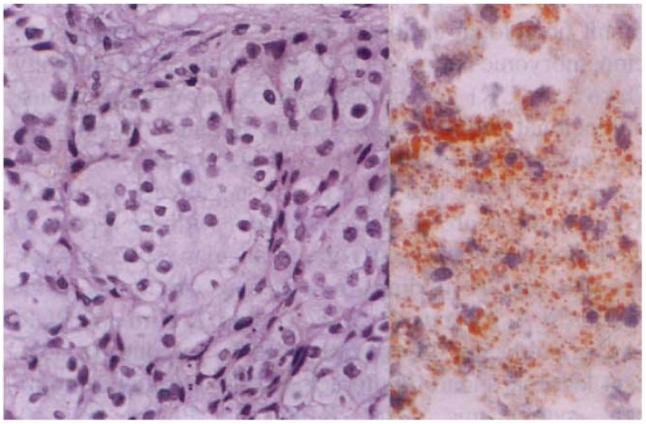

Fig. 4. *The neoplasm (left) consists of large cells with pleomorphic nuclei and abundant vacuolated cytoplasm (haematoxylin and eosin). Oil red O staining of a frozen section of fresh tumour tissue (right) demonstrates numerous fat vacuoles. (×390)*

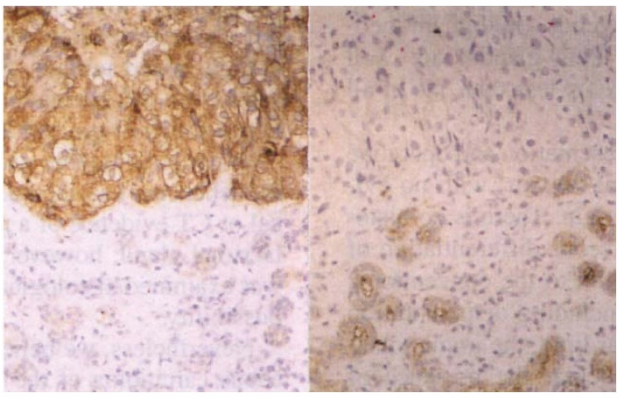

Fig. 5. *Immunoperoxidase stains for HMFG1 (left) and CEA (right), of tumour (above) and lacrimal tubulo-acinar cells (below). Tumour cells show abundant HMFG1 and absent CEA. Lacrimal cells show scarce HMFG1 and abundant CEA. The tumour is not derived from lacrimal gland. (×200).*

Pathological Findings

Freshly biopsied tissue was sampled, snap-frozen and stored at −20 °C for subsequent staining of frozen sections for fat (oil red O stain). The remainder of the tissue was fixed in standard buffered formalin and, after tissue sampling for electron microscopy, was processed into paraffin wax.

On haematoxylin and eosin staining (Figs. 3, 4), lacrimal gland tissue was seen to be infiltrated by a malignant neoplasm composed of nests and sheets of large epithelial cells with abundant vacuolated cytoplasm. On oil red O staining of frozen sections, these cells were seen to contain extensive fat vesicles (Fig. 4) in accordance with accepted diagnostic criteria for sebaceous carcinoma.[1]

Immunohistochemical staining of the tissue was performed for the antigens human milk fat globule 1 (HMFG1; mouse monoclonal antibody, Oxoid, UK), human epithelial membrane antigen (EMA; mouse monoclonal antibody, Dako Ltd, UK), human keratin (KER; rabbit polyclonal antibody, Dako Ltd, UK), human carcinoembryonic antigen (CEA; rabbit polyclonal antibody, Dako Ltd, UK) and human cytokeratin (PKK1; mouse monoclonal antibody, Labsystems, Finland). Tumour tissue stained heavily for HMFG1 (Fig. 5) and EMA, moderately for KER and PKK1, and negatively for CEA. These findings are entirely consistent with the reports of the immunohistochemistry in extraocular sebaceous carcinoma,[2] and the findings in sebaceous carcinoma of the eyelid (M.A. Parsons, D. W. K. Cotton, P. Hird and W. R. Lee, unpublished observations, 1992). In contrast, adjacent lacrimal gland tubulo-acinar cells contained prominent cytoplasmic CEA, KER and PKK1 (Fig. 5), predominantly luminal membrane EMA, but only a trace of HMFG1 (Fig. 5).

Electron microscopy showed cells containing cytoplasmic lipid, joined by tight junctions, but no features of specific differentiation.

DISCUSSION

Sebaceous carcinomas of the eyelids (malignant neoplasms of the Meibomian and Zeis glands) are well documented. These tumours make up less than 1% of all eyelid tumours.[1,3]

In the case reported here, the presentation and operative findings are of a primary lacrimal tumour, with no evidence of eyelid involvement or origin. There is no histological doubt as to the pure sebaceous differentiation of this invasive carcinoma. In addition to the conventional histological diagnostic criteria, including demonstration of intracytoplasmic microvesicular lipid, the immunohistochemical features (and in particular the presence of cytoplasmic HMFG1 and EMA, in the absence of CEA) are in accord with recently reported findings in sebaceous carcinoma.[2]

The findings also demonstrate that the neoplastic cells differ in their staining characteristics (in particular, between HMFG1 and CEA) from the lacrimal gland tissue, indicating that this could not be a neoplasm arising from the lacrimal gland. Although all the antigens we have demonstrated within lacrimal gland can also occur individually (or in different combinations) in carcinomas from many other primary sites, there was no evidence of any other primary neoplasm in our patient, and no evidence that the lacrimal gland neoplasm was a result of metastasis from another site.

There are a number of possible means by which sebaceous carcinomas could be present in the lacrimal gland. Posterior extension of a Meibomian or Zeis gland sebaceous carcinoma into the orbit, mimicking a lacrimal tumour, is described by Shields.[4] In his patient, however, while the upper eyelid was externally normal, on lifting and everting the lid the mass was clearly visible in the upper outer quadrant. Additionally the conjunctiva showed chemosis and injection, there was early corneal pannus, and the anterior segment was involved with cells and flare.

A second possibility is the malignant transformation and sebaceous differentiation within a pleomorphic adenoma or other lacrimal neoplasm of epithelial origin. Mesenchymal elements in benign mixed tumours of the lacrimal gland are thought to represent ectodermal products that have undergone metaplasia[5] and the epithelial or myoepithelial cells can differentiate in various directions. Konrad and Thiel[6] proposed that sebaceous differentiation is a normal property of some salivary ducts. Lacrimal gland neoplasms resemble salivary gland neoplasia clinically and histologically. Pure forms of sebaceous neoplastic differentiation may be found in any type of salivary gland neoplasm which has a ductal component, and in theory this could also apply to lacrimal gland.

Witschel and Zimmerman[7] described a patient with a slowly growing mass in her upper lid over 8 years which suddenly underwent rapid progression. The histological findings were interpreted as malignant mixed tumour including sarcomatous, adenocarcinomatous and pleomorphic sarcomatoid elements. A second patient had a biopsy of a lid lump which showed lipid-laden cells, prompting a diagnosis of Meibomian gland carcinoma, but the exenteration specimen showed remnants of a benign mixed tumour. Konrad and Thiel[6] also reported sebaceous differentiation within a metastasising carcinoma which originated in a pleomorphic adenoma.

In our patient there was no evidence of eyelid origin of the sebaceous carcinoma. Additionally, there was no clinical or CT evidence of a pre-existing neoplasm within the lacrimal gland; however, only part of the lacrimal gland was examined histologically, so this must remain a remote possibility.

Nevertheless, we believe that this was a primary sebaceous carcinoma of the lacrimal gland, possibly arising within a focus of heterotopic sebaceous tissue. The histology shows a single line of tumour cells within normal lacrimal gland. The incidence of heterotopic sebaceous tissue within the lacrimal gland is unknown, but orbital dermoids containing sebaceous gland elements are well recognised.[8]

Key words: Eye, Lacrimal gland, Orbit, Sebaceous gland neoplasm.

REFERENCES

1. Font RL. Eyelids and lacrimal drainage system. In: Spencer WH, editor. Ophthalmic pathology: an atlas and textbook, vol 3, 3rd ed. Philadelphia: WB Saunders, 1986:2200–14.
2. Ansai 2, Hashimoto H, Aoki T, Hozumi Y, Aso K. A histochemical and immunohistochemical study of extra-ocular sebaceous carcinoma. Histopathology 1993;22:127–33.
3. Ginsberg J. Present state of meibomian gland carcinoma. Arch Ophthalmol 1965;73:271–7.
4. Shields J, Font RL. Meibomian gland carcinoma presenting as a lacrimal tumour. Arch Ophthalmol 1974;92:304–6.
5. Font RL, Gamel JW. Epithelial tumours of the lacrimal gland: an analysis of 265 cases. In: Jakobiec FA, editor. Ocular and adnexal tumours. Birmingham: Aesculapis Publishing, 1978:787–805.
6. Konrad EA, Thiel HJ. Adenocarcinoma of the lacrimal gland with sebaceous differentiation: a clinical study using light and electron microscopy. Graefes Arch Clin Exp Ophthalmol 1983;221:81–5.
7. Witschel H, Zimmerman LE. Malignant mixed tumour of the lacrimal gland: a clinicopathologic report of two unusual cases. Graefes Arch Clin Exp Ophthalmol 1981;216:327–37.
8. Font RL. Orbit. In: Spencer WH, editor. Ophthalmic Pathology: an atlas and textbook, vol. 3, 3rd ed. Philadelphia: WB Saunders, 1986:2489–93.