Tumours of the Moll's glands

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SUMMARY Four cases of tumours arising from Moll's glands, two benign mixed tumours of the skin (chondroid syringomas) and two adenocarcinomas, are reported. Three of the patients were over 40 years old. Contrary to the common assumption that malignant Moll's gland tumours are of low-grade malignancy, the two adenocarcinomas described here were highly malignant. Despite vigorous treatment, including orbital exenteration and lymph node resection, one was rapidly fatal and the other recurred with extensive involvement of the paranasal sinuses.

Tumours originating in sweat glands are rare.^{1,2} In the eyelids they may arise from eccrine or apocrine glands. Moll's glands are apocrine sweat glands at the lid margin from which both benign and malignant tumours may occur.^{1,2} Although cysts of Moll's glands are common, true neoplasms are rare.¹ The Moll's glands open into follicles of the cilia, the duct of the Zeis glands, or directly on to the lid margin. They differ from eccrine sweat glands in that they are larger, contain eosinophilic cytoplasm, and show decapitation secretion of apical cytoplasmic processes.

Most tumours of Moll's glands are small and asymptomatic. Clinically they are often misdiagnosed as cysts, papillomas, fibromas, molluscum contagiosum, seborrhoeic keratosis, or other benign lesions. Many histological varieties of apocrine tumours have been described, including adenoma, pleomorphic adenoma, hydrocystoma, cystadenoma, and adenocarcinoma.¹ Other authors have considered papillary syringoma, papillary hidradenoma, and cylindroma to be of apocrine origin.³

Tumours of the Moll's glands are apocrine gland tumours, and their histological features distinguish them from eccrine sweat gland tumours. Moll's gland tumours are generally made up of glandular tissue or tubules that usually comprise two layers. The inner cells frequently retain the characteristic secretory appearance of apocrine sweat glands, though squamous metaplasia also occurs. The outer layer,

consisting of small spindle cells, is thought to represent the myoepithelium of the normal gland.

Low malignancy and slow invasiveness have been considered characteristic of Moll's gland carcinoma.^{4,5} This study, however, shows that the tumour may be highly malignant and may metastasise.

Case reports

CASE 1

A 21-year-old man whose chief complaint was a growth on his right upper lid of five months' duration was examined at the Massachusetts Eye and Ear Infirmary (MEEI). A small cystic lesion was seen at the lid margin, but other findings in the ophthalmological examination were normal. An excisional biopsy was performed. The specimen measured 4×2×2 mm, had a well-demarcated, irregular surface, and was not encapsulated. On histopathological examination the tumour was found to be composed of adenomatous tissue intermingled with loose, myxoid stroma (Fig. 1). Duct-like structures filled with cellular debris were lined with two layers of cuboidal epithelial cells. The superficial cells contained granular eosinophilic cytoplasm and basal nuclei. Some of these cells had apical processes showing decapitation secretion. The deeper layer was closely connected with the spindle-shaped cells that were preponderant in the mucoid stroma. Anaplasia and mitotic figures were not seen. Normal Moll's glands were seen near the tumour. A diagnosis of mixed tumour (chondroid syringoma) of Moll's gland was made.

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Fig. 1 Mixed tumour (case 1) of the skin of right upper eyelid arising from Moll's gland shows adenomatous tissue intermingled with myxoid stroma. (Haematoxylin and eosin, $\times 62$).

CASE 2

A 58-year-old woman seen at the MEEI complained of a growth on her right lower lid that had been enlarging slowly for three years. A basal cell carcinoma had been excised from this lid five years previously. A cystic, translucent lesion with mottled purple discoloration and prominent vessels was present on the lid margin over the temporal portion of the right lower lid, but there was no loss of cilia in the affected area. No other abnormal conditions were observed during the ophthalmological examination. An excisional biopsy was performed, with

Fig. 2 Mixed tumour (case 2) of the skin of right lower eyelid arising from an apocrine cystadenoma shows papillary projections of epithelial cells from the wall of a solitary cystic lesion. The epithelial cells are continuous with myxoid stroma. (Haematoxylin and eosin, $\times 10$).

Fig. 3 Adenocarcinoma of Moll's gland of left lower lid (case 3) shows duct-like structures lined with double-layered epithelium with abundant cytoplasm and basal nucleus. (Haematoxylin and eosin, $\times 90$).

frozen section control to ensure that all margins were free of tumour. The specimen was a $10 \times 5 \times 5$ mm cystic mass attached to a piece of lid tissue. Histopathological examination showed a large, solitary, cystic lesion in the subepidermal layer of the eyelid margin (Fig. 2). The tumour was composed of tubules of various sizes with two layers of irregularly arranged, large columnar cells. The cells in the inner layer contained eosinophilic cytoplasm and basal nuclei. In some areas proliferating epithelium sent papillary projections into the cystic cavity. These projections contained solid nests of cells as well as microcystic spaces. In some areas the epithelial cells were continuous with mucinous, myxoid stroma in the lumen of the cyst. A mixed tumour of Moll's gland arising from an apocrine cystadenoma was diagnosed. There was no evidence of recurrence during a five-month follow-up.

CASE 3

A 66-year-old man came to the Eye, Ear, Nose, and Throat Hospital of the Shanghai First Medical College with a growth in his left lower lid of six months' duration. The growth appeared like a chalazion, but biopsy showed that it was an adenocarcinoma. A full-thickness lid resection was performed. Microscopic examination showed a glandular tumour in the deep subcutaneous tissue of the lid. Ducts of various sizes were lined with double-layered epithelium. Tall columnar cells with abundant eosinophilic cytoplasm and basal nuclei lined the lumen (Fig. 3). In some areas these cells had proliferated to such a degree that they almost obliterated the lumen. The outer cells were smaller with ill-defined contours and

Fig. 4 Adenocarcinoma of Moll's gland of the left lower lid (case 3) shows perineural invasion by the tumour. (Haematoxylin and eosin, $\times 90$).

Fig. 5 Adenocarcinoma of Moll's gland of left lower lid (case 4) shows diffuse infiltrative tumour composed of glandular structure in some areas. (Haematoxylin and eosin, $\times 60$).

small, dark nuclei. Perineural invasion of the tumour was striking (Fig. 4). One year later the tumour recurred in the lateral portion of the lid margin. Enlarged preauricular and submandibular nodes were present. The patient underwent orbital exenteration and dissection of the involved nodes. Histopathological studies showed that the deeper orbital tissues were diffusely infiltrated with tumour nodules. The patient died one year later from intracranial extension of the tumour. A necropsy was not performed.

CASE 4

A 50-year-old man was examined at the MEEI for gradual proptosis of the left eye. One year earlier he was found to have 7 mm of proptosis OS and a firm, rubbery mass below the left lower lid. He had refused further diagnostic studies. In the course of one year proptosis OS increased to 10 mm. The lids were oedematous, and a firm, rubbery mass was present in the left lower lid. Extraocular movement was slightly impaired in the left eye in all fields of gaze. Orbital resiliency was greatly reduced. Other findings of ophthalmological examination of both eyes were unremarkable. Preauricular and submandibular nodes were enlarged and palpable. A biopsy of the lid mass was performed, and a diagnosis of adenocarcinoma of undetermined source was made. Skull and chest roentgenograms, an intravenous pyelogram, upper and lower gastrointestinal examinations, and liver function tests revealed no abnormalities. Radiotherapy (4000 R of deep x-ray in 29 days) to the orbit decreased the tumour size slightly, but this reduction was not sustained. Three months after the original

biopsy the patient underwent an exenteration of the left orbital contents with subtotal maxillectomy and a biopsy of the ethmoid mass. Histopathological examination of the tumour, including the sinus mass, revealed a deeply invasive adenocarcinoma containing gland-like structures with irregularly shaped lumina of various sizes. In some areas the columnar cells lining the lumina contained abundant eosinophilic cytoplasm and basal nuclei (Fig. 5). Areas of decapitation secretion suggested an apocrine sweat

Fig. 6 Adenocarcinoma of Moll's gland (case 4) shows infiltration of eyelid muscles by the tumour. (Haematoxylin and eosin, $\times 63$).

gland origin. Intracellular pigment stained positively for iron. Muscles (Fig. 6), nerves, and lymphatic channels had been invaded. The tumour involved the lacrimal gland, but no transition to the lacrimal gland could be demonstrated. Although the differential diagnosis had included metastatic adenocarcinoma of the orbit and lacrimal gland tumour, systematic evaluation and close follow-up for five years failed to disclose a primary tumour elsewhere. Because cervical adenopathy was apparent, the patient ultimately underwent a radical neck dissection (at another hospital), which was supplemented with chemotherapy 39 months after the initial diagnosis. Ten months after the neck dissection he had an enlarged node in the subclavicular region, but he was subsequently lost to follow-up.

Discussion

Case 1 in this series represented a mixed tumour of Moll's glands. Such a tumour has been described by Daicker and Gafner⁶ in the upper lid of a 24-year-old man. However, their tumour was probably a combination of clear-cell hidradenoma and apocrine mixed tumour, because it contained both clear cells with glycogen granules and tubular formations with apocrine secretions. Apocrine mixed tumours of the skin occur frequently on the face and neck⁷ but are rare in the eyelids. Among the 188 cases on file at the Armed Forces Institute of Pathology (AFIP) Hirsch and Helwig⁷ found seven in the eyebrow but only one in the lids. The histopathological criteria for a diagnosis of mixed tumour require the presence of both 'mesenchymal' stroma and adenomatous elements that show a transition to the stroma elements. In case 1 the outer layer of spindle cells was continuous with the myxoid stroma, and the inner layer of columnar cells retained the histological appearance of apocrine gland cells. The location of the tumour at the lid margin, as well as its proximity to the apparently normal Moll's glands, suggested its origin from the Moll's glands. This lesion seemed benign because it had not infiltrated surrounding tissue and lacked cellular anaplasia.

Case 2 may be considered a mixed tumour arising from an apocrine cystadenoma.⁸ The lesion was a translucent, purplish cyst, which is consistent with the histopathological findings that it had a solitary cystic configuration. The characteristic apocrine-type secretory epithelium in the inner layer of the cyst wall indicated that this tumour had features of origin from the Moll's gland, even though solitary cysts usually come from ducts. Areas of papillomatous hyperplasia in the cyst wall and migration of spindle cells into a scant myxoid stroma permitted the diagnosis of mixed tumour. Weizenblatt⁸ has reported a basal cell

carcinoma arising from the cyst wall of a Moll's gland. Although our patient had had a basal carcinoma removed from the same site five years earlier, that tumour and the mixed tumour of the skin could not be related with certainty. Benign Moll's gland tumours have been described by Fuchs, Salzmann, Rumschewitsch, and Letulle, and Duclos.¹ In such tumours the formation of a small cyst is common, but it is rare to find a single large cyst with diverging dendritic tubules forming a considerable part of the tumour, as was seen in our case 2.

Cases of adenocarcinoma of Moll's glands have been reported by various authors.^{4-8,13} In Stout and Cooley's series¹⁴ of 11 sweat gland carcinomas case 3 has been accepted by Eliot and Ramsay¹⁵ as being of Moll's gland origin. Whorton and Patterson¹⁶ and Knauer and Whorton¹⁷ have each reported one case of Moll's gland carcinoma. These two tumours, as well as the tumour reported by Hagedoorn,¹² may have been sebaceous gland carcinomas.^{13,14} Orban's case¹⁸ of Moll's gland carcinoma consisted of many large cysts lined with single layers of cuboidal epithelium having papillomatous as well as solid cellular foci. In Aurora and Luxenberg's⁴ case the lesion was judged to be of apocrine origin according to the following criteria: lid margin location, eosinophilic cytoplasm of tumour cells, decapitation secretion, and demonstration of intracellular iron-positive granules. The biological behaviour of the tumour could not be evaluated because the follow-up period was too short.

Evidence that the tumour in our cases 3 and 4 originated in the Moll's gland included its irregular, coiled glandular structures, its eosinophilic columnar epithelium with decapitation secretion, a typical double layer of cells in the tubules, and cystic dilation of the tubule with papillary infoldings from the cyst wall.

Cases 3 and 4 in this report demonstrates that Moll's gland tumours can be highly malignant. Radical surgery including exenteration should be considered as early as possible in Moll's gland carcinomas. Irradiation has been claimed to be effective in some cases,¹⁹ but the result in case 4 of this series does not support this claim.

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