ADENOMA OF THE LIMBAL CONJUNCTIVA*

BY

J. FRANÇOIS AND M. RABAEY

From the Ophthalmological Clinic of the University of Ghent

Director: Prof. J. François, M.D.

ADENOMATA of the bulbar conjunctiva and particularly of the limbus are extremely rare, and we have been able to find only four cases reported:

Schirmer (1891).—A small adenoma with a smooth surface, situated on the conjunctiva between the insertion of the medial rectus muscle and the semilunar plica. The tumour was 2 mm. high, with a diameter of 2.5–3 mm. Microscopic section shows glandular tissue, the gland lobules being composed of a single layer of cylindrical epithelial cells.

Duclos (1921).—A cystic adenoma of the bulbar conjunctiva, situated near the semilunar plica, probably derived from a Krause's gland.

Drak (1925).—Cystic papillomatous adenoma situated near the limbus between the lateral and superior rectus muscles.

Dame (1946).—Adenoma measuring $8 \times 8.5 \times 3$ mm., of which 2.5 mm. extended over the bulbar conjunctiva, centring in the 7 o'clock position, and 6 mm. over the cornea. It is, however, more probable that the whole tumour had its origin in the limbal conjunctiva. Microscopic section shows well-formed acini of what is apparently a functioning lacrimal gland.

Marshall (1929).—This is not so much a true adenoma, as an epithelioma (Epithelioma adenoides cystica). Microscopic examination reveals squamous epithelial cells between which we may observe cystic cavities and also areas of mucoid degeneration (reported by Duke-Elder).

We have had the opportunity to observe a case of true adenoma of the conjunctiva situated on the limbus.

CASE REPORT

On February 16, 1950, a woman aged 36 came to the ophthalmological clinic with a small tumour on the right eyeball. She remembered having observed it for the first time at the age of 10 years, and it had recently started growing slowly (Fig. 1).

Examination.—The eye presented a yellowish, well-defined, rather thin tumour, measuring 5×3.5 mm., situated on the limbal conjunctiva between 3.30 and 5 o'clock. It did not adhere to the deep layers and had a rich vascularization, best noticeable on the surface, which was irregular and embossed, especially near the corneal margin. Slit-lamp examination distinctly revealed three cyst-like formations in the lower parts of the neoformation. Three large blood vessels, issuing from the semilunar plica and the inner part of the conjunctiva, converged to the tumour, where they branched out.

* Received for publication January 25, 1951.

FIG. 1.—Appearance of right eye before operation.

Vision.—Right eye improved to 20/20 by +3.5 D., left eye to +2.75 D. The eyes were otherwise normal, and we could find no congenital anomalies, either in the eye or in other parts of the body.

Operation.—The tumour was removed completely. Fixation in formol 10 per cent. Convalescence uneventful.

Histological Report.—Microscopic sections show the typical structure of an adenoma. We see four glandular, isolated lobules, supported by fibrous conjunctival tissue, which undoubtedly correspond to the small cystic formations seen by slit-lamp examination (Fig. 2). The external surface appears to be normally epithelialized. This squamous

FIG. 2.—Small cystic formations seen by slit lamp. Obj. 3.5:1. $\times 40$.

FIG. 3.—Small area in which squamous epithelium is absent. Obj. 8 mm. $\times 125$.

FIG. 4.—Structure of adenoma. Obj. 8 mm. $\times 125$.

epithelium is missing for a short distance in one single area, close to the largest lobule (Fig. 3), where the tubuli are in immediate contact with the outside.

The adenoma presents a structure which is almost identical with that of the main lacrimal gland, being composed of tubuli and acini, covered by cubical or prismatic epithelial cells, with the nucleus near the base (Figs 4 and 5).

In some glandular acini may be observed an incipient papillomatous proliferation of the wall (Fig. 6, overleaf). In some sections a short excretory duct, covered by lower cells and passing through the epithelium, is seen (Fig. 7, overleaf).

After thionine staining, light metachromatic granulations appear in the upper part of the cytoplasm of nearly all cells. We may conclude that a secretion does exist.

FIG. 5.—Structure of adenoma. High-power view of Fig. 4. Obj. 8 mm. $\times 500$.

FIG. 6.—Incipient papillomatous proliferation. Obj. 8 mm. $\times 175$.

FIG. 7.—Short excretory duct passing through the epithelium. Obj. 8 mm. $\times 175$.

DISCUSSION

Several glandular formations, such as the glands of Krause, Wolfring-Ciaccio, and Henle, can be found only in the conjunctiva of the eyelids and of the fornix. The caruncle also contains sebaceous glands and modified sweat- and lacrimal glands. The orbital lacrimal gland is developed during the third month of foetal life by about eight epithelial buds from the upper and temporal side of the conjunctival sac.

The glands of Krause are accessory lacrimal glands with the same structure as the main lacrimal gland. They are developed between the fifth and the seventh month of foetal life, as growths of the basal cells of the conjunctival fornix. In the upper fornix there are from twenty to forty glands and in the lower six to eight.

The glands of Wolfring-Ciaccio are larger than those of Krause, but have the same structure. They are situated on the superior tarsal border of the upper eyelid between the extremities of the glands of Meibomius.

The glands of Henle occur in the palpebral conjunctiva between the tarsal plates and the fornix; they are probably not true glands, but folds of the mucous membrane.

The glands of Krause and Wolfring may give rise to adenomata in the conjunctiva which will be found, like these, near the conjunctival

sac. This we meet in the cases of Rumschewitsch (1890; 1902) and Salzmann (1891), where the tumours are situated near the superior border of the tarsus of the upper eyelid.

It is much more difficult to understand the presence of adenomata on the bulbar and especially on the limbal conjunctiva. There are no normal glandular formations in the bulbar conjunctiva. All adenomata found there show, however, a structure analogous to the main and accessory lacrimal glands, and we may perhaps assume that these adenomata are developed by ectopic lacrimal buds.

There might be, however, another, phylogenetic, explanation. Glands are found in the bulbar conjunctival area and, what is even more important, in the limbal area of several animals. Sweat-glands have been described in the bulbar conjunctiva of the goat, the pig, and the ox. The glands of Manz (1859) have been seen in the limbal area in the pig, the lamb, the ox and the fox, and they have also been described in the human subject, though this is not generally accepted (Wolff, 1948). This suggests that adenomata of the limbal conjunctiva may arise from the remains of the glands of Manz.

REFERENCES

- DAME, L. R. (1946). *Amer. J. Ophthal.*, **29**, 579.
 DRAK, J. (1925). *Klin. oczna*, **3**, 97.
 DUCLOS, L. (1921). *Bull. Ass. franç. Cancer*, **10**, 225.
 MANZ, W. (1859). *Z. rat. Med.*, 3 ser., **5**, 122.
 MARSHALL, J. C. (1929). *Proc. roy. Soc. Med.*, **23**, 43.
 RUMSCHEWITSCH, K. (1890). *Klin. Mbl. Augenheilk.*, **28**, 387.
 ——— (1902). *Ibid.*, **40**, pt. 2, p. 109.
 SALZMANN, M. (1891). *Arch. Augenheilk.*, **22**, pt. 1, p. 292.
 SCHIRMER, O. (1891). *Graefes Arch. Ophthal.*, **37**, pt. 1, p. 216.
 WOLFF, E. (1948). "The Anatomy of the Eye and Orbit". 3rd ed., p. 169. Lewis, London.