

An expansive papilloma of the nasolachrymal drainage system harbouring human papilloma virus*

Christian Buchwald¹, Vera Skoedt², Mirko Tos¹

¹ Department of Otolaryngology, Gentofte University Hospital, Copenhagen, Denmark

² Department of Pathology, Gentofte University Hospital, Copenhagen, Denmark

SUMMARY

We report a case of an expansive tumour extending from the lachrymal sac into the adjacent maxillary sinus. Histology showed a benign exophytic papilloma. By means of the in situ (DNA) hybridization technique, human papilloma virus (HPV) 6/11 were demonstrated, indicating a viral aetiology, similar to exophytic papillomas of the nose and larynx.

Key words: papilloma, nasolachrymal apparatus, human papilloma virus

INTRODUCTION

Tumours of the ectodermally-derived lachrymal drainage system are rare. Less than 200 primary epithelial tumours have been reported. The malignant tumour is probably more common than the benign. Based upon a review of the literature this ratio is approximately 3:1 (Ryan and Font, 1973; Spencer, 1986; Callender et al., 1993; Madreperla et al., 1993). As in the sino-nasal cavities, the most common benign neoplasm in the lachrymal drainage system is the papilloma (Callender et al., 1993; Buchwald et al., 1995a). The typical localization is the lachrymal sac. Hitherto, only three papillomas of the lachrymal sac have been investigated for the presence of HPV, all three being positive for HPV types 6 and 11 (Madreperla et al., 1993).

We present our experience with a case of expansive papilloma extending from the lachrymal sac into the adjacent maxillary sinus. The case is described in order to draw the attention of head-and-neck surgeons to the existence of this tumour and to illustrate another possible HPV-induced lesion.

CASE REPORT

A 65-year-old male with chronic epiphora presented at our ENT-department upon referral from an ophthalmologist, who had discovered a stenosis of the right lachrymal drainage system. The patient had been treated for intermittent dacryocystitis during the past decade. A recent dacryocystography showed a distended sac with an intraluminal filling defect and a retention of the contrast. Upon physical examination, a non-tender mass in the region of the medial canthus was seen. The patient underwent extranasal microsurgical dacryocystorhinostomy (Tos et al., 1986, 1995). A whitish papillomatous tumour originating from the medial wall of the lachrymal sac was identified.

The tumour was expansive, as it extended from the enlarged sac through an eroded nasolachrymal duct into the maxillary sinus. The upper half of the sinus was filled with tumour masses. It was possible to remove a 60-mm-long tumour, with a diameter varying from 5 to 40 mm *in toto*, leaving a well-functioning nasolachrymal apparatus. The patient was discharged from the hospital without complaints on the first post-operative day.

Histology showed papillomatous tissue with a predominant exophytic growth pattern (Figure 1). The epithelium was mainly of the transitional type, in some areas there was non-keratinizing squamous metaplasia, while in other areas columnar epithelium was present. Varying degrees of focal dysplasia was observed, but carcinoma *in situ* was not found. Some of the epithelial cells, typically in the squamous metaplastic epithelium, were coilocytic.

Paraffin-embedded tissue sections were subjected to *in situ* hybridization with biotinylated DNA probes for detection of HPV (Buchwald et al., 1995a). DNA hybridization was performed first with "wide-spectrum" probes including HPV types 6, 11, 16, 18, 30, 31, 33, 35, 45, 51, and 52 (DAKO A/S, Denmark), and then with "type-specific" probes, i.e. HPV 6/11, 16/18 and 31/33/35 (Enzo Diagnostic). Tissue sections were deparaffinized and pre-treated with 0.1% protease (type XXIV; Sigma Chemical Co., St. Louis, USA) for 30 min at room temperature. Denaturation was carried out at 92°C for 6-7 min, and hybridization overnight at 42°C. The detection system for visualization of the hybridization involved anti-biotin and the alkaline phosphatase/anti-alkaline phosphatase (APAAP) complex. Appropriate positive and negative controls were included. A positive reaction for HPV with wide-spectrum probes was demonstrated. The presence of HPV 6/11 was then confirmed by using the type-specific probes (Figure 2).



Figure 1. A predominantly exophytic growth pattern is demonstrated by this papilloma of the lachrymal sac (Haematoxylin-eosin staining).

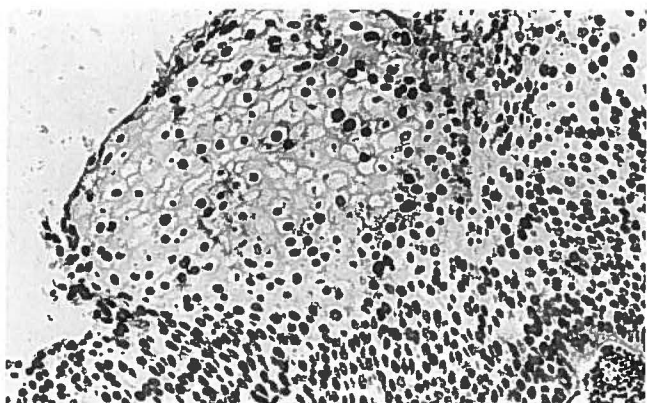


Figure 2. *In situ* (DNA) hybridization showing focal positive reactions for HPV 6/11 in the nuclei of coilocytic cells in the upper part of the epithelium of the papilloma. The positive reaction is mainly present in exophytic areas with non-keratinizing squamous metaplasia.

Clinical examination performed three months after the operation showed no epiphora due to incorporation of the healthy part of the sac mucosa into the nasal mucosa. CT scans confirmed that there was no evidence of recurrence. An eventual recurrence will be directly visible by endoscope at the agger nasi region.

DISCUSSION

Like the sinonasal papillomas, papillomas of the nasolachrymal apparatus have been classified in different ways by several authors (Fechner and Sessions, 1977; Moss, 1983; Spencer, 1986). Ryan and Font (1973) divided their 18 cases of nasolachrymal papillomas into three types according to their growth pattern; (1) inverted papillomas; (2) exophytic papillomas; and (3) mixed papillomas. In this series, it is noteworthy that none of the six exophytic papillomas developed into carcinomas, while seven of the 12 inverted or mixed papillomas either had foci of carcinomas or developed into carcinomas. The only recommended treatment is surgical excision, but a recurrence rate for all types of papillomas of 40% is not unusual (Spencer, 1986). Papillomas of the sinonasal tract can be classified similarly into three histopathological types with corresponding characteristics (Hyams, 1971; Buchwald et al., 1995a). Recent studies on HPV in sinonasal papillomas have indicated a definite association between HPV (i.e., HPV types 6 and 11) and one of the three classification types, the exophytic papilloma (Buchwald et al.,

1995b). Laryngeal papillomas, known to have an exophytic growth pattern, show a similar relationship to HPV types 6 and 11. Hence, our finding of an exophytic HPV 6/11-positive papilloma of the lachrymal sac is not unexpected.

Madreperla et al. (1993) did not classify HPV-positive nasolachrymal papillomas in their study. Other HPV types (i.e., types 16 and 18) have been identified in carcinomas and papillomas associated with carcinomas, including lesions of the upper respiratory tract (Buchwald et al., 1995b). In their study, Madreperla et al. (1993) included three carcinomas of the nasolachrymal sac. All three were positive for HPV type 18. Further and larger studies on a possible role of HPV in the aetiology of nasolachrymal papillomas and carcinomas would be of great interest.

The most common presenting signs and symptoms occurring with nasolachrymal papillomas are epiphora, inflammatory signs and a mass, that clinically could be mistaken as evidence of chronic dacryocystitis. CT scans are probably the best imaging modality for nasolachrymal tumours and it is useful in the differentiation between tumour and chronic dacryocystitis (Callender et al., 1993). In the present case, the correct diagnosis has been established after a period of 10 years with intermittent dacryocystitis. The large dimensions of this tumour are probably well explained by the protected course. Although nasolachrymal papillomas are rare, the diagnosis should be kept in mind in any patient presenting with symptoms of chronic dacryocystitis and epiphora.

REFERENCES

1. Buchwald C, Franzmann MB, Tos M (1995a) Sinonasal papillomas: A report of 82 cases in Copenhagen County, including a longitudinal epidemiological and clinical study. *Laryngoscope* 105: 72-79.
2. Buchwald C, Franzmann MB, Jacobsen GK, Lindeberg H (1995b) Human papilloma virus (HPV) in sinonasal papillomas: A study of 78 cases using *in situ* hybridization and polymerase chain reaction. *Laryngoscope* 105: 66-71.
3. Callender DL, Frankenthaler RA, Weber RS, Dodd L, Batsakis JG (1993) Carcinomas of the lacrimal drainage system. *Head Neck* 15: 313-319.
4. Fechner RE, Sessions RB (1977) Inverted papilloma of the lacrimal sac, the paranasal sinuses and the cervical region. *Cancer* 40: 2303-2308.
5. Hyams VJ (1971) Papillomas of the nasal cavity and the paranasal sinuses: A clinico-pathological study of 315 cases. *Ann Otol Rhinol Laryngol* 80: 192-206.
6. Madreperla SA, Green WR, Daniel R, Shah KV (1993) Human papilloma virus in primary epithelial tumours of the lacrimal sac. *Ophthalmology* 100: 569-573.
7. Moss ALH (1983) Inverted papilloma of the nose: An unusual cause of a medial canthal mass. *Br J Plast Surg* 36: 254-257.
8. Ryan SJ, Font RL (1973) Primary epithelial neoplasms of the lacrimal sac. *Am J Ophthalmol* 76: 73-88.
9. Spencer WH (1986) *Ophthalmic Pathology*. W.B. Saunders Company, Philadelphia, pp. 2312-2336.
10. Tos M, Balle V, Andersen SR (1986) Dacryocystorhinostomy. *Ann Otol Rhinol Laryng* 95: 352-355.
11. Tos M, Boberg Ans G, Perriard A, Balle V (1995) Extranasal micro-surgical dacryocystorhinostomy. In: M Tos, J Thomsen, V Balle (Eds.) *Rhinology*. State of the Art. Kugler Publications, Amsterdam, pp. 241-245.

Christian Buchwald, MD
Department of Otolaryngology
Rigshospitalet
DK-2100 Copenhagen
Denmark