The Journal of Laryngology and Otology
August 1994, Vol. **108**, pp. 716–718

Glycogen-rich clear cell carcinoma in the tongue

ESA RAJAB, M.S. (ORL)*, SHARIFAH NOR AKMAL, D.C.P.†, ABDUL MAJID NASIR, M.S. (ORL)*

Abstract
The case of a minor salivary gland tumour, arising from the tongue, with nodal metastasis is presented. Biopsy of the tumour and fine-needle aspiration cytology of the neck swelling showed the presence of a clear cell carcinoma with evidence of nodal metastases. A commando operation was performed and the defect was reconstructed using a local tongue flap. The literature review indicated that the neoplasm was rare and its site of occurrence rather unusual.

Key words: Tongue; Carcinoma, clear cell; Neoplasm, metastasis; Lymph nodes; Neck

Introduction

Glycogen-rich clear cell carcinomas are rare tumours of the salivary glands. Over the past decade only one case has been published where a primary tumour occurred in the tongue but without cervical metastases (Uri *et al.*, 1986). This paper discusses our experience in the management of this uncommon problem.

Case report

The patient, a 31-year-old lady presented in August, 1990 with a swelling on the right side of the neck of four months duration. Examination revealed a large right cervical mass measuring 3 × 3 cm which was firm, nontender and mobile. Oral examination revealed a small firm nonulcerated growth about 1 cm in diameter arising from the right side of the posterior one-third of the tongue. A clinical diagnosis of malignant minor salivary gland tumour with cervical metastases was made. An incisional biopsy was taken from the primary site and a few samples from the neck swelling were also obtained, by the fine-needle technique, for cytological examination. Histological examination showed a tumour composed of epithelial cells arranged mainly in compact anastomosing trabeculae with foci of acinar formation (Figure 1). The cells were polyhedral in shape with well defined cell margins and abundant clear or granular eosinophilic cytoplasm. Special stains showed the presence of glycogen but no mucin (PAS positive; diastase soluble). The fibrous stroma showed some myxoid changes. It was infiltrative and exhibited moderate mitotic activity. A diagnosis of a rare salivary gland tumour of debatable histogenesis, termed glycogen-rich clear cell carcinoma, was made.

A radical neck dissection was performed with the primary tumour excised via a transpharyngeal transoral route by splitting the mandible. The defect was reconstructed using a local tongue flap. Histological examination of the excised specimen confirmed the diagnosis and that the surgical margins were clear. She received post-operative irradiation and completed treatment at a total dose of 5000 rad. She was well at follow-up.

Discussion

Glycogen-rich clear cell tumours of the salivary gland are rare. They account for less than one per cent of all the primary tumours of the salivary glands (Nagao *et al.*, 1981). Being rare, they pose problems both to the pathologist in trying to define the tumour and to the surgeon in planning the treatment. The majority of these tumours occur in the parotid gland (84 per cent); 11 per cent occur in the submandibular gland and five per cent in the minor salivary glands (Ellis and Gnepp, 1988). They are more common in the older age group, although a tumour has been reported in a 17-month-old baby (Uri *et al.*, 1986). The male to female ratio is 1:2.

The morphological features and biological behaviour of this group of tumours have been poorly characterized in the literature. Clear cell tumour of the salivary gland has been described as a glycogen-rich clear cell adenoma (Corridan, 1956) clear cell adenoma (Saksela *et al.*, 1972), glycogen-rich adenoma (Goldman and Klein, 1972), glycogen-rich adenocarcinoma (Mohamed and Cherrick, 1975) and epithelial-myoepithelial carcinoma (Corio *et al.*, 1982; Daley *et al.*, 1984). Chen (1983) reported a case of clear cell carcinoma of the salivary gland and in a review of the literature, suggested that clear cell carcinomas of the salivary gland could be divided into two types i.e. monomorphic and bimorphic. The bimorphic variant is usually described as epithelial-myoepithelial carcinoma (Luna *et al.*, 1987), and it usually occurs in the major salivary glands. The monomorphic variant, as in this case, appears to be more confined to the minor salivary glands. Both types are considered to be of low grade malignancy (Batsakis, 1979; Simpson *et al.*, 1990).

The list of tumours for differential diagnosis consists of other cell tumours, both primary and secondary. Primary clear cell tumours of the salivary gland which have to be excluded are epithelial-myoepithelial carcinomas (the bimorphic variant of clear cell carcinoma), mucoepidermoid carcinomas, acinic cell carcinomas sebaceous carcinomas and clear cell oncocytic tumours. At present, histochemical reactions, light microscopic and morphological features are the most reliable methods of differentiating between these tumours. Immunohistochemical studies and electron microscopic findings may provide additional useful information.

Epithelial-myoepithelial carcinoma has a biphasic pattern and the myoepithelial component shows positive staining with antibody against S100 protein. Ultrastructural evidence of myoepithelial differentiation has been reported in epithelial-myoepithelial carcinomas (Donath *et al.*, 1972). Clear cells

From the Departments of Otolaryngology* and Pathology†, Faculty of Medicine, University Kebangsaan Malaysia, Jalan Raja Muda, Kuala Lumpur, Malaysia.
Accepted for publication: 6 April 1994.

https://doi.org/10.1017/S0022215100127938 Published online by Cambridge University Press

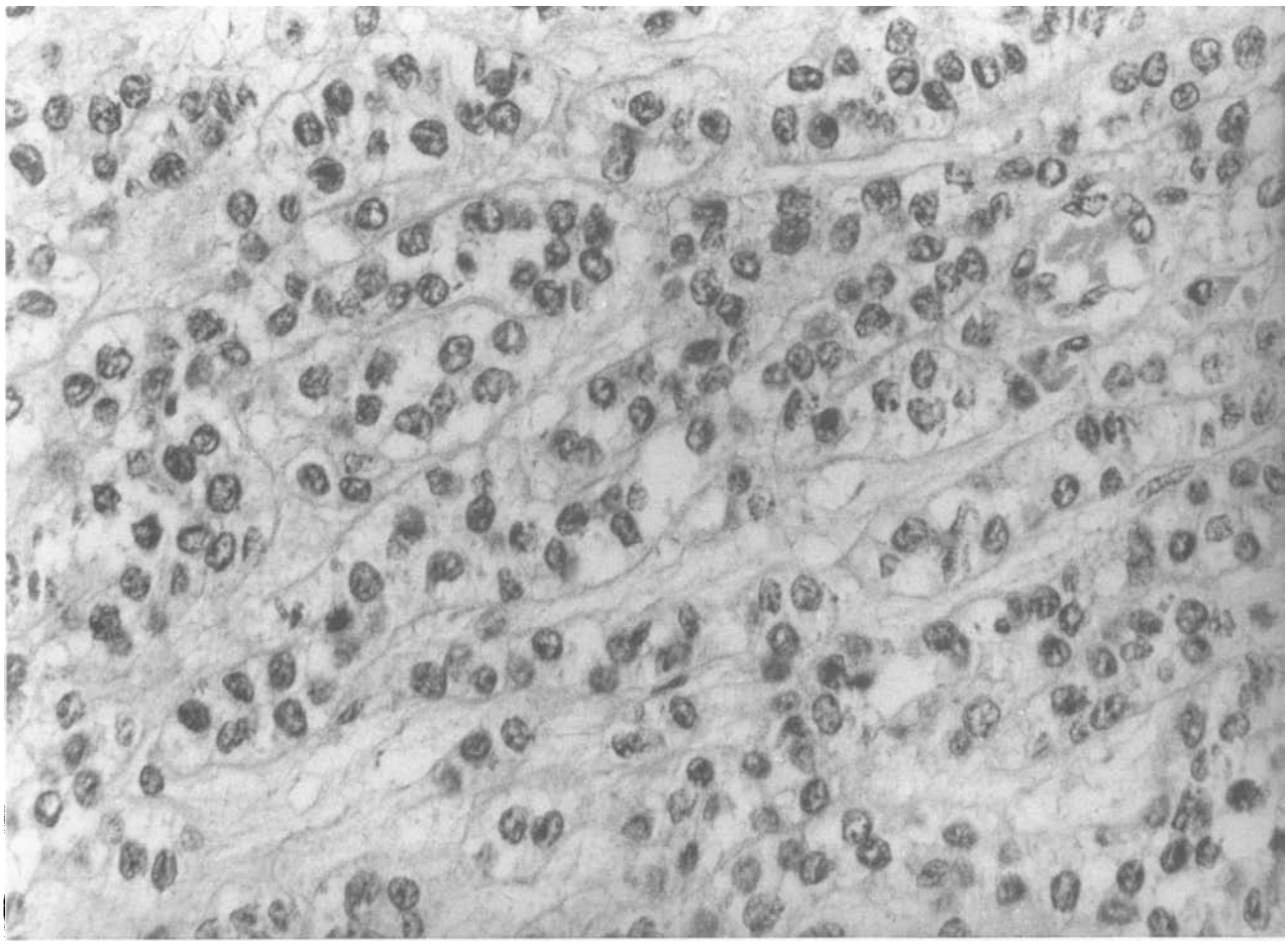

FIG. 1

Polyhedral cells with well defined cell margins and clear cytoplasm arranged in compact anastomosing trabeculae. (H&E; × 100).

found in mucoepidermoid carcinomas contain epithelial mucin, and these tumours also display areas of squamous differentiation. Sebaceous carcinomas may contain clear cells but these contain lipid droplets. Acinic cell carcinomas are usually negative for mucin and glycogen. In this case, the presence of abundant glycogen in tumour cells as demonstrated by the PAS positive and diastase soluble reaction exclude the other tumours mentioned above.

The fact that glycogen-rich clear cell tumours are rare in the head and neck indicates the need to rule out other primary sites as the causes of possible metastasis in the region. A complete physical examination is mandatory with particular attention paid to the possibilities of primary lesions in the parathyroid (adenocarcinoma), kidney (hypernephroma), breast, uterus and the gastrointestinal tract which are known to simulate the glycogen-rich tumour (Mohamed and Cherrick, 1975). Investigations such as an intravenous pyelogram, barium enema, skull and long bone skeletal surveys are important in order to rule out a distant primary tumour. However in this case the diagnosis was clear because of the presence of both the primary and secondary sites synchronously with no evidence of a primary elsewhere. So far, the glycogen-rich monomorphic clear cell carcinomas have not been reported to show evidence of myoepithelial differentiation both immunohistochemically (S100 negative reaction) and ultrasonographically (absence of myofilaments). There is strong evidence to suggest that it arises from ductal epithelium (Echevarria, 1967; Mohamed and Cherrick, 1975).

Although the bimorphic (epithelial-myoepithelial carcinoma) and monomorphic clear cell carcinomas have been lumped together since both are rare and contain clear cells, they should be considered as morphologically distinct tumours. Despite the light microscopic and ultrastructural differences, a close histogenic relationship between these two tumours has been suggested (Goldman and Klein, 1972).

Surgery aimed at complete excision of the tumour was the primary treatment. The patient should have a lifelong follow-up because the tumour can recur for as long as 20 years afterwards (Corio *et al.*, 1982). Probably for this reason, some authors advocate radiotherapy after surgical excision of the tumour (Gomez *et al.*, 1982) although the benefit of adjuvant radiotherapy is uncertain.

Conclusion

This is a rather unusual case of clear cell carcinoma of the tongue with cervical node metastases. After 2.5 years of follow-up, the patient is still free of the disease which suggests a favourable prognosis.

Acknowledgement

We wish to thank Professor K. Shanmugaratnam for his valuable advice on this case.

References

Batsakis, J. G. (1979). *Tumours of the Head and Neck: Clinical Pathological Considerations*, 2nd Edition. William & Wilkins, Baltimore, pp 47–48.

Chen, K. T. K. (1983) Clear cell carcinoma of the salivary gland. *Human Pathology* **13:** 91–93.

Corio, R. L., Sciubba, J. J., Brannon, R. B., Batsakis, J. G. (1982) Epithelial-myoepithelial carcinoma of intercalated duct origin. *Oral Surgery* **53:** 280–287.

https://doi.org/10.1017/S0022215100127938 Published online by Cambridge University Press

Corridan, M. (1956) Glycogen-rich clear cell adenoma of the parotid gland. *Journal of Pathological Bacteriology* **72:** 623–626.
Daley, T. D., Wysocki, G. P., Smout, M. S., Slinger, R. P. (1984) Epithelial-myoepithelial carcinoma of salivary glands. *Oral Surgery, Oral Medicine and Oral Pathology* **57:** 512–519.
Donath, K., Seifert, G., Schmitz, R. (1972) Zur Diagnose und Ultrastruktur des tubularen Speichelgangcarcinomas: epithelial-myoepitheliales Schalt-stuckcarcinoma. *Virchows Archives* (Pathology/Anatomy) **356:** 16–21.
Echeivarria, R. A. (1967) Ultrastructure of the acinic cell carcinoma and clear cell carcinoma of the parotid gland. *Cancer* **20:** 563–571.
Ellis, G. L., Gnepp, D. R. (1988) Unusual salivary gland tumours. In *Pathology of the Head and Neck*. 1st Edition. (Gnepp, D. R., Ed.), Churchill-Livingstone, New York, pp 585–661.
Goldman, R. L., Klein, H. Z. (1972) Glycogen-rich adenoma of the parotid gland. An uncommon benign clear cell tumour resembling certain clear cell carcinomas of salivary origin. *Cancer* **30:** 749–754.
Gomez, L. G., Luna, M. A., Mackey, B., MacCord, R. (1982) Clear cell tumour of the parotid gland. *American Journal of Clinical Pathology* **77:** 245 (Abstract).
Luna, M. A., Batsakis, J. G., Ordonez, N. G., Mackay, B., Torledo, M. E. (1987) Salivary gland adenocarcinomas: a clinico-pathologic analysis of three distinctive types. *Seminars of Diagnostic Pathology* **4:** 117–135.
Mohamed, A. H., Cherrick, H. M. (1975) Glycogen-rich adenocarcinoma of the minor salivary gland. *Cancer* **36:** 1057–1066.
Nagao, K., Matsuzaki, O., Saiga, H., Sugano, I., Shigematsu, H., Kaneko, T., Katoh, T., Kitamura, T. (1981) Histopathologic studies on carcinoma in pleomorphic adenoma of the parotid gland. *Cancer* **48:** 113–121.
Saksela, E., Tarkkanen, J., Wartiovaara, J. (1972) Parotid gland adenoma of possible myoepithelial origin. *Cancer* **30:** 742–748.
Simpson, R. H., Sarsfield, P. T., Clarke, T., Babajews, A. W. (1990) Clear cell carcinoma of minor salivary glands. *Histopathology* **17:** 433–438.
Uri, A. K., Wetmore, R. F., Iozzo, R. V. (1986) Glycogen rich clear cell carcinoma in the tongue. *Cancer* **57:** 1803–1809.

Address for correspondence:
Esa Rajab, M.S.,
Department of ENT,
Faculty of Medicine,
University Kebangsaan Malaysia,
Jalan Raja Muda,
Kuala Lumpur,
Malaysia.

https://doi.org/10.1017/S0022215100127938 Published online by Cambridge University Press