Detection of S-100 labelled cells in nasopharyngeal carcinoma

LIBERO LAURIOLA, FABRIZIO MICHETTI,* STENO SENTINELLI, DOMENICO COCCHIA*

From the Departments of Human Pathology and *Anatomy, Universita Cattolica, Rome, Italy

SUMMARY S-100 antigen containing cells with dendritic features, recognisable by morphological and immunohistochemical criteria as belonging to the Langerhans’ or interdigitating reticulum cell type, have been found in undifferentiated nasopharyngeal carcinoma. The presence of these cells, which have a special function of antigen presentation in immune responses, may be involved in a possible modulation of nasopharyngeal carcinoma associated Epstein-Barr virus infection and host-tumour interactions.

Material and methods

Formalin fixed, paraffin embedded neoplastic tissue from 16 patients with carcinoma of the nasopharynx and from patients with squamous cell carcinoma of the oral cavity (two cases), larynx (two cases), and skin (four cases) were examined. Tissue slices were treated with 0-3% hydrogen peroxide in methanol for 20 min to block endogenous peroxidase activity and then processed for the immunoperoxidase reaction with the peroxidase-antiperoxidase method.11 Rabbit antiserum to S-100 either obtained commercially (Dakopatts a/s, Glostrup, Denmark) or produced by us as previously reported12 was used at dilutions varying from 1/500 to 1/1000. The specificity of the immunostaining was confirmed by replacing the primary antiserum with non-immune rabbit serum or preabsorption of anti-S-100 antiserum with purified antigen. Slices were also reacted with rabbit anti-human muramidase (1/500) or antikeratin (1/400) antibodies (Dakopatts a/s, Glostrup, Denmark). The details of the immunostaining procedures have been reported elsewhere.12

Results

The 16 cases of nasopharyngeal carcinoma studied were classified by their prominent histological features according to Micheau et al1: 10 were classified as undifferentiated nasopharyngeal carcinoma and six as squamous cell carcinoma. In eight of the 10 cases of undifferentiated nasopharyngeal carcinoma paraffin sections treated with anti-S-100 antiserum showed the presence of some labelled cells, which
were irregular in shape, often with dendritic features, and scattered throughout the neoplastic epithelial component (Figs. 1 and 2). In some cases the S-100-labelled cells were evenly distributed among the neoplastic epithelial cells while in other cases they were unevenly dispersed. When the anaplastic tumour cells formed well defined masses in the lymphatic stroma no preferential location of the labelled cells at the periphery or in the central area of the nest was seen. Moreover, in some cases S-100 labelled cells with dendritic morphology were present in the accompanying lymphoid infiltrate, although they were less abundant than in the neoplastic epithelium. In three cases, labelled cells with the same morphological features as those seen in undifferentiated nasopharyngeal carcinoma at the primary site were also detected among anaplastic epithelial cells that had metastasised to lymph nodes.

Only occasional S-100 positive cells were found in one of the six nasopharyngeal squamous cell carcinoma cases studied. Squamous cell carcinomas of mucosal or epidermal origin were also investigated by S-100 antiserum. Only one of the four cases of cutaneous origin showed an appreciable number of
dendritic shaped S-100 containing cells. No S-100 labelled cells were seen in squamous cell carcinomas of the oral cavity or larynx (Fig. 3).

When serial sections of nasopharyngeal carcinoma were treated with antimuramidase antiserum, a population of rounded cells, mainly polymorphonuclear and monocytes, was shown in both neoplastic and accompanying lymphoid tissue. By morphological and topographical criteria, however, it was apparent that S-100 labelled cells did not react with the antimuramidase antiserum (Fig. 4).

In previous studies antikeratin antiserum confirmed the epithelial nature of all cases of undifferentiated nasopharyngeal carcinoma examined by giving focal staining in many of the neoplastic cells. No preferential relation between S-100 labelled cells and either keratin labelled or unlabelled anaplastic epithelial cells could be ascertained.

**Discussion**

In this study S-100 immunostaining allowed us to detect in undifferentiated nasopharyngeal carcinoma an appreciable number of labelled cells characterised by dendritic shape and irregularly indented nuclei. These cells can be identified by morphological and immunohistochemical criteria as belonging to the Langerhans' or the interdigitating reticulum cell types, which are currently considered to be closely related cells with the special function of antigen presentation. In fact, both epidermal Langerhans' and interdigitating reticulum cells of human lymphoid organs have been shown to be stained by anti-S-100 antiserum. The finding in undifferentiated nasopharyngeal carcinoma of S-100 labelled cells with features of Langerhans' and of interdigitating reticulum cells, both in primary tumour and in lymph node metastases and occasionally in the surrounding lymphoid infiltrate, seems to suggest a traffic of these cells in the neoplastic environment. In this respect, migration of Langerhans' cells or their bone marrow precursors into the epidermis and their movement from epidermis to dermis and subsequent appearance in dermal lymphatics and draining lymph nodes after antigen challenge have been shown in normal skin. An increased number of Langerhans' cells has been reported in benign epidermal tumours, whereas contradictory findings of the presence and the number of Langerhans' cells have been reported in squamous cell carcinomas both of cutaneous and mucosal origin.

In our study, S-100 labelled dendritic cells appeared to be few or absent in most squamous cell carcinomas of both mucosal and epidermal origin. The finding of an appreciable number of cells resembling Langerhans' or interdigitating reticulum cells in most cases of undifferentiated nasopharyngeal carcinoma is particularly important.
because of the involvement of the immune system in the control of Epstein-Barr virus infection and Epstein-Barr virus associated neoplasms, including undifferentiated nasopharyngeal carcinoma. Further studies, also supported by immunohistostructural investigations, are needed to ascertain the precise nature of these cells and their possible role in the modulation of anti-Epstein-Barr virus immune responses and host-tumour interactions.

This work was supported in part by a grant from Progetto Finalizzato “Oncologia” of the CNR. The authors thank Mr Alessandro Rinelli for his excellent technical assistance and Mr Paolo Baldassari for his editorial assistance.

References


10. Takahashi K, Yamaguchi H, Ishizeki J, Nakajima T, Nakazato

Lauriola, Michetti, Sentinelli, Cocchia


Requests for reprints to: Dr Libero Lauriola, Department of Human Pathology, Universita Cattolica, Largo Francesco Vito, 1, 00168 Roma, Italy.
Detection of S-100 labelled cells in nasopharyngeal carcinoma.

L Lauriola, F Michetti, S Sentinelli and D Cocchia

*J Clin Pathol* 1984 37: 1235-1238
doi: 10.1136/jcp.37.11.1235

Updated information and services can be found at:
[http://jcp.bmj.com/content/37/11/1235](http://jcp.bmj.com/content/37/11/1235)

**Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
[http://group.bmj.com/group/rights-licensing/permissions](http://group.bmj.com/group/rights-licensing/permissions)

To order reprints go to:
[http://journals.bmj.com/cgi/reprintform](http://journals.bmj.com/cgi/reprintform)

To subscribe to BMJ go to:
[http://group.bmj.com/subscribe/](http://group.bmj.com/subscribe/)