G-CSF-Producing Giant Squamous Cell Carcinoma (SCC): Changes in Serum G-CSF in Parallel with SCC Antigen

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Sir,

Squamous cell carcinoma (SCC) can occur anywhere on the skin and in mucous membranes with a squamous epithelium (1). Malignant tumours producing granulocyte colony-stimulating factor (G-CSF) have been reported in lung cancer, thyroid carcinoma, bladder carcinoma and cutaneous angiosarcoma (2). We encountered a case of G-CSF-producing SCC, which was diagnosed by immunohistochemical staining and showed changes in serum G-CSF in parallel with the serum SCC antigen level and the disease course.

CASE REPORT

A 63-year-old Japanese man presented in August 2005 with a 10-year history of a giant tumour on his left upper arm (Fig. 1). The tumour was raised by approximately 3 cm and measured approximately 10 cm in diameter. The tumour surface showed partial necrosis and bled easily. The patient was extremely emaciated with general lassitude and was also afebrile.

A blood cell count revealed anaemia: red blood cells 3.59 × 10^6/μl (normal: 3.65–5.64 × 10^6/μl) and haemoglobin 9.4 g/dl (normal: 10.8–16.9 g/dl). The white blood cell count was 20,600/μl, the C-reactive protein level was 3.59 (normal: 0.0–0.5 mg/dl), and the following parameters were elevated: serum G-CSF, 117 pg/ml (normal: 6.1–21.5 pg/ml); serum SCC antigen, 40 (normal: 0.0–1.5 ng/ml). Cultures from the tumour surface were sterile.

A computed tomography (CT) scan of the left upper arm showed attachment of the tumour to the triceps brachii muscle. Although a CT scan of the lung showed no obvious metastatic lesions, it did reveal multiple, large, high-density lesions in the left axillary region, suggesting left axillary lymph node metastasis.

Histological examination showed massive intradermal growth comprising a solid undifferentiated pattern of basophilic atypical cells, which were compatible with SCC (Fig. 2a). Similarly to previous reports, the tumour cells showed positive reactions for G-CSF in immunohistochemical staining with anti-G-CSF monoclonal

Fig. 1. A huge, dark-reddish dome-shaped tumour was apparent on the left upper arm.

Fig. 2. (a) Basophilic-coloured tumour nest with extravasation of red blood cells (haematoxylin and eosin, original magnification ×40). (b) Immunohistochemical staining with anti-G-CSF monoclonal antibody showed a positive reaction in the cytoplasm of atypical tumour cells (×200).
amplification of the G-CSF gene in the tumour cells. Sato et al. (4) found no rearrangement or amplification of G-CSF production in malignant tumours has not been elucidated. In turn, this suggests that G-CSF can act as a tumour growth factor.

Serum G-CSF and SCC antigen levels decreased significantly after surgical debulking, but started to increase again in parallel with tumour recurrence and metastasis (Fig. 3). The serum G-CSF level could not be measured in follow-up after August 24th because we were unable to obtain the patient’s consent.

DISCUSSION

G-CSF is a 19 kDa polypeptide that participates in neutrophil proliferation and maturation in bone marrow, and is secreted by activated T cells, macrophages, fibroblasts and vascular endothelial cells. Mayumi et al. (3) reported 66 cases of G-CSF-producing tumours in fibroblasts and vascular endothelial cells. These findings suggest that G-CSF produced by tumour cells may stimulate their proliferation. Reports of G-CSF-producing tumours usually show peripheral granulophilia or leukaemoid reactions, suggesting that tumour-derived G-CSF acts on bone-marrow cell proliferation and differentiation to granulocytes.

Given the previous findings, we concluded that increased serum G-CSF contributed to the leukaemoid reaction in our case, since the serum G-CSF level was markedly increased. The elevation and decrease of the serum G-CSF level and positive immunohistochemical staining for G-CSF in tumour cells suggest that the tumour was a G-CSF-producing squamous cell SCC. In turn, this suggests that G-CSF can act as a tumour marker and a growth factor for proliferation of tumour cells.

REFERENCES