CASE REPORT

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Granulocytic sarcoma of the nasal cavity*

Jean-Michel Prades[1], Ausama Alaani[1], Jean-François Mosnier[2], Jean-Marc Dumollard[2], Christian Martin[1]

[1] Department of Otolaryngology-Head and Neck Surgery, Saint-Etienne University Hospital Centre, Bellevue Hospital, St-Etienne, France

[2] Department of Pathology, Saint-Etienne University Hospital Centre, Bellevue Hospital, St-Etienne, France

SUMMARY

Granulocytic sarcoma (GS) is a rare localised tumour of malignant myeloid precursor cells occurring at an extramedullary site. It is usually associated with a myeloproliferative disorder but may be seen preceding the onset of leukemia. Extracranial GS may occur virtually anywhere in the body and may be easily confused with large cell and lymphoblastic lymphoma. This paper reports an unusual case of primary GS of the nasal cavity and paranasal sinuses, which presented as a nasal obstruction. Multidrug combination chemotherapies and bone marrow transplantation were performed. Awareness of the potential location of GS in the nasal cavity and paranasal sinuses should contribute to better define the prognostic significance of this uncommon entity.

Key words: granulocytic sarcoma, acute non-lymphocytic leukemia, paranasal sinuses, nasal cavity

INTRODUCTION

The granulocytic sarcoma (GS) also called "chloroma" (from Greek chloros meaning green) is a rare localised tumour of malignant myeloid precursor cells occurring at an extramedullary site (Neiman et al., 1981). The term GS includes any tumour mass related to any form of acute non-lymphocytic leukemia or myelodysplastic syndrome (Byrd et al., 1995). GS occur at both intra- and extracranial locations (Freedy et al., 1991). It usually presents in concert with myeloproliferative disorders, but is also seen preceding the onset of leukemia (Liu et al., 1973). Intracranial GS are thought to arise from dural and subarachnoid infiltrations by leukemic cells (McAllister et al., 1987). The extracranial GS arise in two predominant sites: the orbits and paranasal sinuses, but may occur virtually anywhere in the body (Vishwakarma et al., 1969; Dunnick et al., 1982). This paper reports an unusual case of GS that presented as nasal obstruction.

CASE REPORT

A 20-years old female presented with left-sided progressive nasal obstruction with a 4-month history, no disorders of smell and no nasal haemorrhage. Overall she was in a good state of health. Clinical examination showed a deviation of the nasal septum and hypertrophy of the left inferior turbinate. The CT scan revealed an opacity in the left nasal cavity, the maxillary and sphenoid sinuses. No osseous destruction was detected (Figures 1a and 1b). There were normal findings in the peripheral blood. Septoplasty was performed in combination with an endoscopic guided left inferior turbinectomy and middle meatotomy. Local examination showed an inferior turbinate two times bigger than the opposite side and and that was covered by a reddish smooth swelling. On microscopic examination, there was a diffuse infiltration of the sinusal mucosae by sheets of undifferentiated tumour cells with granular cytoplasm. Their nuclei were irregular, indented and contained nucleoli (Figure 2). Mitotic figures were rare. The immunohistochemical study showed that all tumour cells strongly expressed the pan-leukocyte antigen CD45 and CD34 that is usually present on myeloid progenitor cells (Figure 3). The young patient was referred to the Hematology department, bone marrow aspiration and biopsy exhibited no tumour infiltration. The patient received chemotherapy (doxorubicin and cytosine arabinoside) without any radiotherapy. Three months later, she complained of persistent nasal obstruction, nasal haemorrhages, and cephalgies. Another CT scan revealed the same opacity of the left nasal cavity and the left sinuses without any osseous destruction. Histopathological examination showed persistent granulocytic sarcoma in the nasal cavity and paranasal sinuses. Control aspiration biopsy of the bone marrow revealed considerable tumour infiltration (reported as 91% blast

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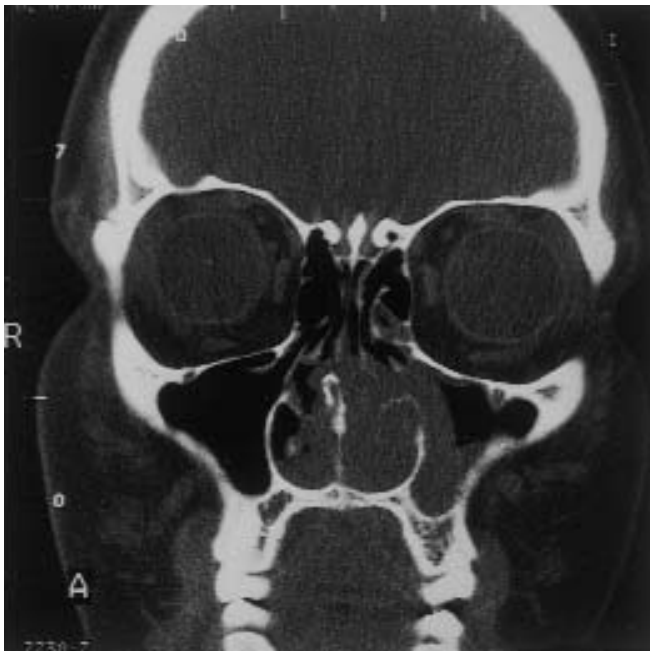
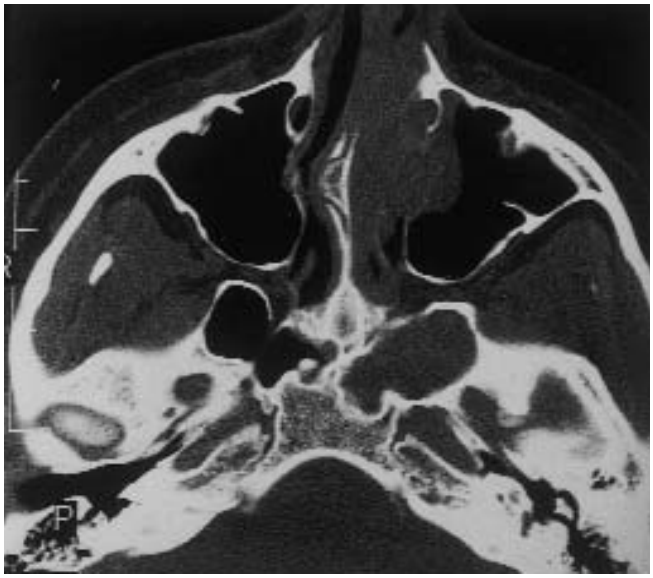


Figure 1. CT scan demonstrated non-specific opacity in the left nasal cavity, the maxillary and sphenoid sinuses.

cells). A cytogenetic study of the bone marrow cells demonstrated a single abnormal clone with +21 and a t(19:1) translocation. Further chemotherapy (mitoxantrone – aracytine) resulted in a partial remission. Bone marrow transplantation was performed and no recurrence occurred during the 18-month follow-up.

DISCUSSION

GS is a rare malignant neoplasm with a reported incidence of 3 to 4.7 % in patients with myeloproliferative disorders. Several factors, including chromosal abnormalities as t(8:21), cell surface markers and blast differentiation have been associated with a higher incidence of extramedullary leukaemia (Byrd et al., 1995). Approximately 70% of GS occur in patients with a known myeloproliferative syndrome or acute non-lymphocytic leukemia, the other 30% have no underlying disease at the time of diagnosis (proleukemic phase). Ninety percent of these patients will develop acute leukemia within a few months (Lukes et al., 1992). The tumour occurs most often in childhood and in young adults, with no gender preference (Kao et al., 1987). The majority of GS occurs in the subperiostal region of bone most commonly in the skull, sternum, ribs, and the proximal portions of the long bones. A variety of other sites may be involved (skin, salivary glands). The peculiarity of GS appearing at puncture sites for arterial and venous blood and marrow samples is noteworthy in patients with acute promyelocytic leukemia (Sanz et al., 2000). Of patients with leukemia and chloroma 25-57% have lymph node involvement (Liu et al., 1973). Symptomatic GS usually causes non-specific local pain and local mass effect. Epistaxis is caused by multiple factors including thrombocytopenia, hypoprothrombinemia and



ischemic necrosis of the nasal mucosa secondary to leukemic infiltration. The disease may present as a prolonged upper respiratory infection resistant to standard therapy (Sanford et al., 1967).

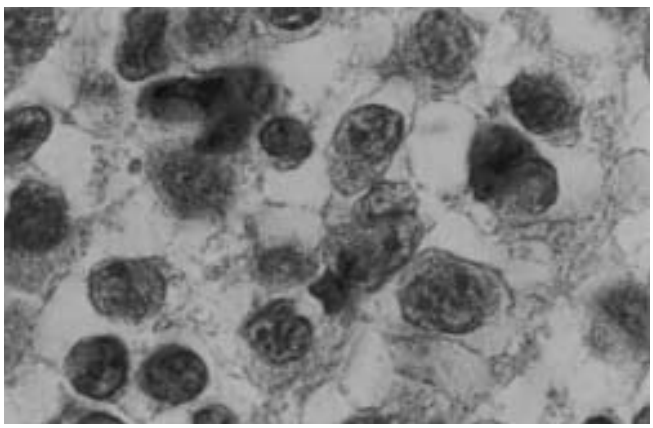


Figure 2. The tumour cells were characterized by a granular oesinophilic cytoplasm and an irregular nucleus with nucleoli (HES x 1000).

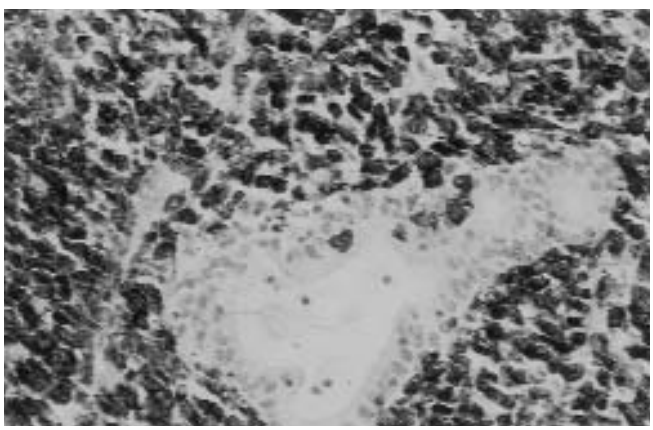


Figure 3. The tumour cells, appearing in dark, are strongly immuno stained for CD34. A residual sinusal gland is entrapped in the tumour.

The myeloperoxydase within the immature tumour cell occasionally gives a greenish appearance on gross inspection. Cytologic features of GS include discohesive cells with a moderate amount of cytoplasm, round to oval nuclei, distinct nuclear membranes, fine chromatin and prominent nuclei (Mockli, 1997). Histologic features demonstrate a diffuse and infiltrative population of mononuclear cells, accompanied by granulocytic cells at various stages of maturation, and classically include eosinophilic myelocytes (Byrd et al., 1995). It may be easily confused with large cell and lymphoblastic lymphoma, particularly in poorly differentiated cases: immunohistochemical studies offer a reliable method (Fellbaum et al., 1990).

On CT scan, extracranial GS demonstrated non-specific findings. A marked tumour involvement of the nasal cavity and paranasal sinuses may be associated with osseous destruction (Takaue et al., 1986). Intracranial lesions have been demonstrated as iso-, or slightly hyperdense relative to normal brain tissue. CT appearance is similar to that of meningioma, lymphoma and metastatic lesions (Sowers et al, 1979). MR evaluation of intracranial GS and those arising in contiguous structures such as orbits or paranasal sinuses show hypointensity on T1-weighted images and iso intensity on T2-weighted images relative to white matter (Freedy et al., 1991).

The prognosis of acute non-lymphocytic leukemia with GS has been improved with the development of better-defined multidrug combination chemotherapies and intensive supportive care (Takaue et al., 1986; Deme et al., 1997). GS are radiosensitive and local radiotherapy may be used with combination chemotherapy (Deme et al., 1997). A wariness of the potential location of GS for nasal cavity and paranasal sinuses should contribute to better recognition of new cases and better define the prognostic significance of this uncommon entity.

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Jean-Michel Prades, MD, PhD
Department of Otolaryngology
Head and Neck Surgery
Bellevue Hospital
St-Etienne University Hospital Centre
Boulevard Pasteur
F-42055 Saint-Etienne Cedex 2
France

Tel: +33-(0)-477-127794
Fax: +33-(0)-477-127854
E-mail:
christian.martin@chu-st-etienne.fr