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Radiation-induced antrochoanal fibrosarcoma

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Abstract
Therapeutic radiation for malignant conditions is known to cause sarcomatous change in an irradiated field after a latent period; equally this change may occur following radiotherapy to benign conditions which may result in a more difficult management problem later. Radiotherapy to benign conditions should be reserved for use after failure of conventional surgery or other interventional techniques.

Introduction

Sarcomatous change in tissues previously irradiated for primary malignancy is widely reported (Goolden, 1957; Hatfield and Schulz, 1970; Schindel *et al.*, 1972; Laskin *et al.*, 1988; Nigam *et al.*, 1990). Of greater concern are the significant numbers of sarcomata appearing after irradiation for benign conditions. Although rare, post radiation fibrosarcoma presents a considerable management problem.

We discuss a case of fibrosarcoma presenting as antrochoanal polyposis to the same unit 23 years after primary irradiation of a benign, obstructing, nasopharyngeal fibroblastic tumour.

Case report

A 53-year-old lady presented to this unit in 1967, following six months of increasing dysphagia, anorexia, weight loss, epistaxes and a long history of bilateral nasal obstruction. Examination of the post-nasal space revealed a large tumour obstructing the nasal airway and pushing the velum down and forward. Skull radiographs confirmed the presence of a non erosive, soft tissue mass occupying the nasopharynx with extension into the oropharynx, left maxillary antrum and ethmoidal sinuses. Biopsy showed a cellular tumour composed of plump spindle cells with a low mitotic rate and no evidence of sarcomatous change. There were occasional giant cells with surrounding inflammation and superficial ulceration. The appearances were those of a benign fibroblastic tumour (Fig. 1).

Initial treatment was 6600 cGy megavoltage radiotherapy over 20 fractions. The residual tumour was removed in two stages after ligating the tumour pedicle, using Denker's modification of the Caldwell Luc approach. The post-operative period was unremarkable and she was discharged from follow up after two years.

She presented again 23 years after treatment with complete left-sided nasal obstruction caused by antrochoanal polyposis. Because of her previous history she underwent a CT scan of the head which revealed an extensive tumour involving the left nasal cavity, maxillary antrum and both frontal and ethmoidal sinuses (Figs. 2 & 3). The resected polyp was shown to be an ulcerated,

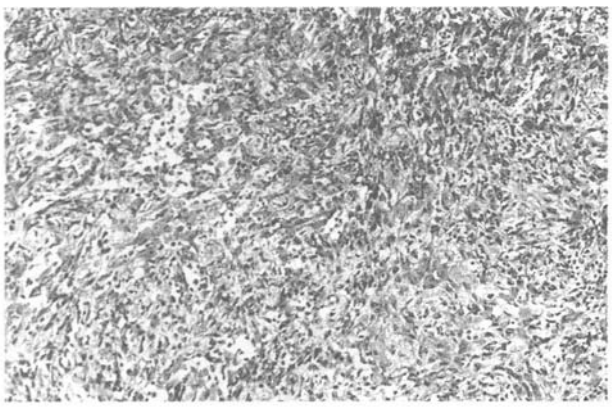

Fig. 1
Original tumour specimen showing fascicular arrangement of spindle cells (magnification ×40)

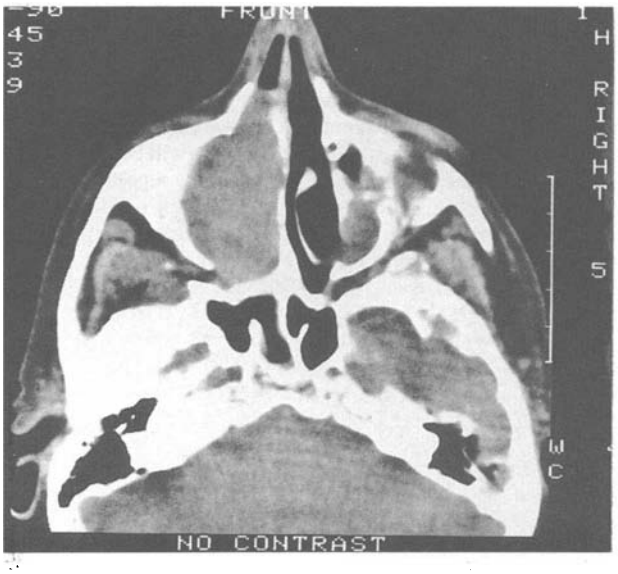

Fig. 2
CT scan of paranasal air sinuses demonstrating tumour involvement.

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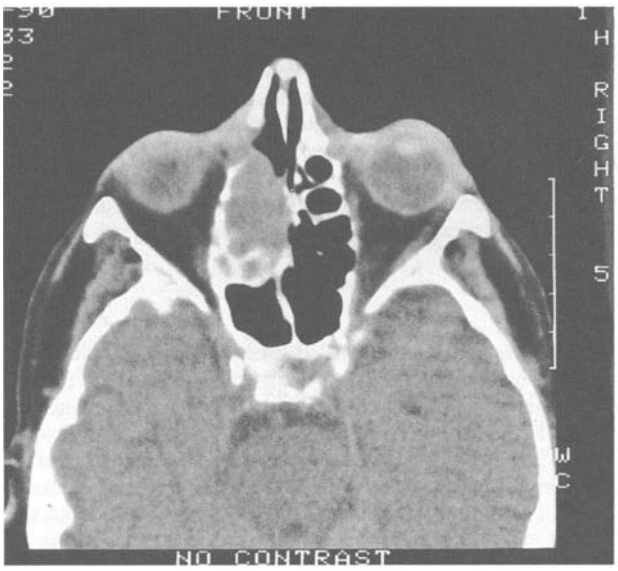

Fig. 3

CT scan of paranasal air sinuses demonstrating tumour involvement.

partly necrotic tumour consisting of intersecting bundles of pleomorphic spindle cells, features similar to the original tumour but now sarcomatous (Fig. 4). Tumour clearance was performed through the previous Denker's approach and further histological examination confirmed the diagnosis of fibrosarcoma. The patient remains well and is under regular follow-up.

Discussion

The original specimen was thought to be a form of benign fibroblastic proliferation, types of which include nodular fasciitis, fibromatosis and fibrous histiocytoma (Hyams *et al.*, 1988). The recurrent tumour was histologically similar but frankly sarcomatous and the role of the intervening radiotherapy was considered. Fibrosarcoma, especially of the head and neck following radiotherapy is very uncommon (Goolden, 1957; Gane *et al.*, 1970; Hatfield and Schulz, 1970; Coia *et al.*, 1980). These tumours, however, should be regarded as highly malignant as they invariably present late and their position often leads to significant problems with surgical access, a predicament highlighted by Warren and Sommer as long ago as 1936. With the advent of megavoltage radiotherapy the frequency of skin complications including carcinoma has decreased and therefore the relative proportion of post radiation sarcoma will be expected to increase (Laskin *et al.*, 1988). There are many reported cases of sarcoma following radiotherapy for malignant conditions but increasingly there are reports of sarcoma many years after radiotherapy to benign lesions, such as tinea capitis, sinusitis, TB and haemangioma (Ward and Buchanan, 1977; Coia *et al.*, 1980; Laskin *et al.*, 1988).

Certain strict criteria should be observed before diagnosing post radiation sarcoma (Nigam *et al.*, 1990); there should be evidence that the area within which the second tumour arises was previously normal, the location of the second tumour should have been previously irradiated, there should be a latent period and doses in the range 2000–10,000 cGy given. This case satisfies each of these criteria, including a latent period of 23 years, very much in the ranges previously reported (Gane *et al.*, 1970; Hatfield and Schulz, 1970).

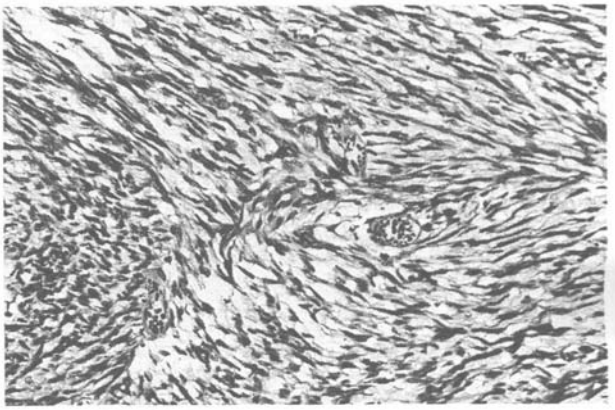

Fig. 4

Fibrosarcoma showing intersecting bundles of large, pleomorphic fibroblasts (magnification ×100)

It is well recognized that radiotherapy plays a role in oncogenesis and that fibrosarcoma may arise in any irradiated structural tissue (Gane *et al.*, 1970). There are few indications for treating benign conditions with radiotherapy, for these and increasingly for operable malignant conditions, surgery or modern techniques such as embolization should be the first line of treatment (Nigam *et al.*, 1990), allowing further surgery or radiotherapy for recurrence. Sarcoma of the head and neck should always be suspected if symptoms recur even after relatively recent irradiation.

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