Fibrosarcoma in a previously irradiated larynx

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TRUE fibrosarcomata are rare tumours of the larynx and, in reviews of the literature, thirty-two cases had been recorded by 1969 (Flanagan *et al.*, 1965; Davies, 1969; Batsakis and Fox, 1970). The total frequency of mesenchymal neoplasms of the larynx does not exceed 2 per cent (Batsakis and Fox, 1970). Fibrosarcomata have previously been reported occurring *de novo* in the larynx and not, as in this particular case, arising at a site within the larynx previously treated by radiotherapy for a squamous cell carcinoma.

Case history

The patient, a 68-year-old male, first presented in 1963 with a five-week history of hoarseness. Laryngoscopy, both indirect and direct, revealed a keratotic area occupying the surface of the anterior two-thirds of the left vocal cord. The cord itself was fully mobile. Biopsy at this time showed no evidence of malignancy. Three months later the lesion had clinically extended posteriorly along the cord surface and biopsy was histologically reported as a well-differentiated squamous cell carcinoma. There were no neck nodes palpable and the cord was still fully mobile. Further investigations failed to reveal any evidence of metastatic spread and the lesion was classified $T_1N_0M_0$. The patient was then exposed to mega voltage radiotherapy over 28 days, receiving a tumour dose of 5,600R delivered in twelve treatments within an atmosphere of hyperbaric oxygen.

Following this therapy the patient remained symptomatically and clinically clear of further disease until 1974 when he complained of a two-month history of increasing hoarseness. Indirect examination at this time revealed a smooth, non-ulcerated lesion occupying the site of the previously treated squamous carcinoma, but with left cord fixation. A direct examination was performed and biopsy material was reported as showing 'dysplasia of the squamous lining cells on an underlying stroma of mature fibrous tissue'. The patient was closely observed and over the following four weeks the lesion appeared to extend into the left laryngeal ventricle and also into the left subglottis. A further biopsy was taken following which the patient developed stridor and increasing respiratory embarrassment necessitating an urgent tracheostomy. The biopsy material was reported as showing 'spindle cells in loose sheets with little mature stroma and many blood vessels with thin walls. The nuclei of the spindle cells show hyperchromatism and mitotic figures'. A histological diagnosis was made of a well-differentiated fibrosarcoma.

All haematological, biochemical and radiological investigations suggested there were no metastases and the patient, therefore, underwent a total laryngectomy in October 1974.

The specimen (Fig. 1) shows an extensive, smooth, lobulated lesion occupying the left laryngeal ventricle, left true cord, and extending into the left subglottis. Histology, performed on the laryngectomy specimen (Fig. 2), confirmed the biopsy diagnosis of a well-differentiated fibrosarcoma.

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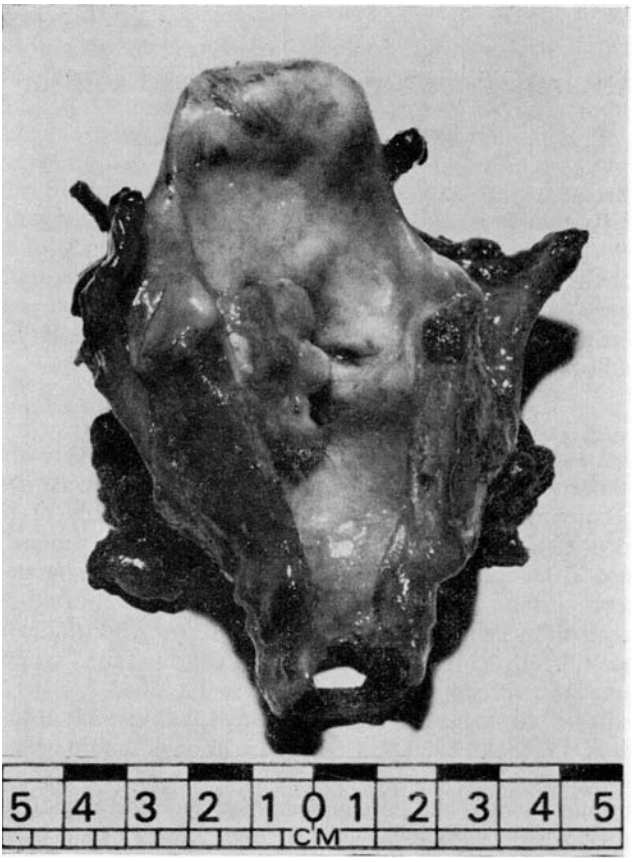


FIG. 1.

The patient made an uneventful recovery and developed a satisfactory oesophageal voice. He has remained in good health and disease-free since the operation.

Discussion

Neoplasia of the larynx is almost always of squamous cell origin. Shaw (1965), reviewing laryngeal neoplasia, treated between 1947 and 1956, found only a single fibrosarcoma in 306 cases. Since this series Shaw (1971) has reported only a solitary fibrosarcoma in 1,516 laryngeal neoplasms. Havens and Parkhill (1941) reported an incidence of fibrosarcoma in the larynx of 0·5 per cent, and Flanagan *et al.* (1965) reviewed 29 cases in the literature.

Howard and Keller (1954) attempted to describe the macroscopic features and behaviour of laryngeal sarcomata as follows:

(1) Arise on true vocal cord.

(2) Lobulated.

(3) Seldom ulcerate.

(4) Occur over the age of 40.

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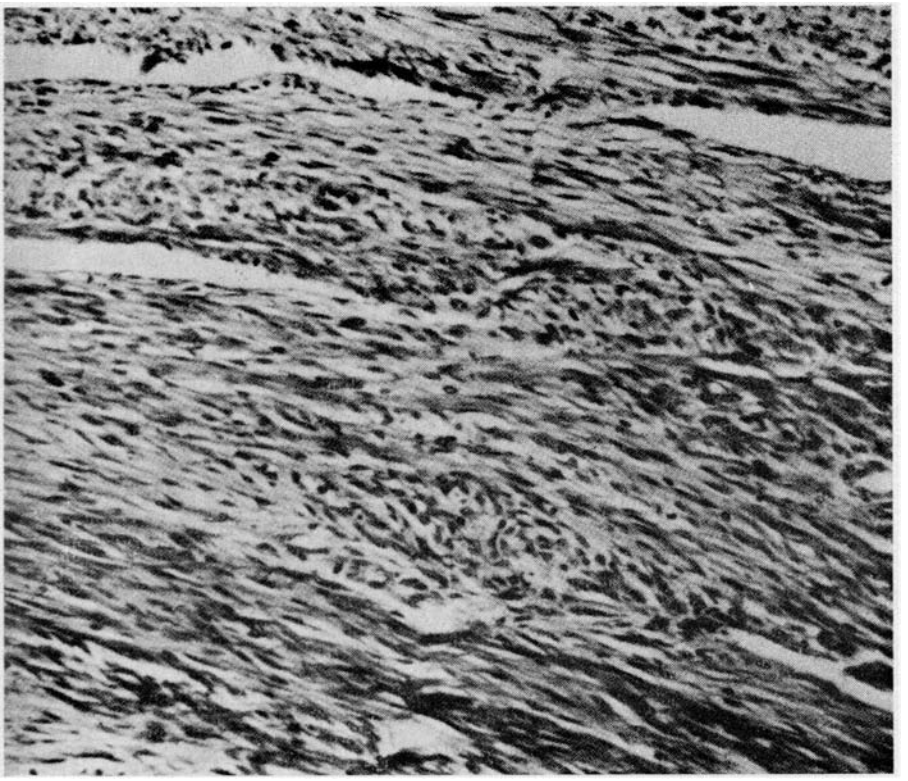


FIG. 2.

(5) Metastasize late.

(6) Male:Female = 3:1.

These features have, since this time, been confirmed by other authors (Batsakis and Fox, 1970; Davies, 1969). It would appear that the tumour herein described fulfils these criteria.

Prognosis in fibrosarcomata has been investigated in relation to the patients' age, duration of symptoms before treatment, size, histological pattern, and aggressiveness of therapy (Mackenzie, 1964; Stout, 1948; Bizer, 1971; van der Werf-Messing and Van Unnik 1965). The degree of differentiation proposed by Stout (1948) appears to give the best prognostic guide, with well-differentiated lesions surviving considerably better than the poorer-differentiated tumours. Stout *et al.* (1967) further reviewed and reclassified fibrosarcomata of the head and neck but found little to alter his earlier findings.

The aetiological relationship of the previous irradiation in this case presentation must now be considered. It is well recognized that previous irradiation can be an aetiological factor in the development of squamous neoplasia of the larynx (Goolden, 1957; Van Dishoeck, 1968; Baker and Weissman, 1971) and that benign laryngeal papillomata may undergo malignant change following radiation therapy (Majoros *et al.*, 1963; Wlodyka 1962). This case raises the possibility of a mesenchymal neoplasm developing following irradiation.

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Goolden (1951) laid down the following criteria which were felt necessary to link previous irradiation with a subsequent neoplasm:

(1) Microscopic evidence of malignancy.

(2) Area previously exposed to extensive dose of radiation.

(3) Considerable time lapse between irradiation and tumour occurrence.

(4) Location of the tumour in the area of highest radiation exposure.

Goolden (1957) found the average time lapse between exposure and neoplastic change to lie between 25 and 30 years, with the shortest time lapse being 10 years. Van Dishoeck (1968) found a time lapse between 10 and 20 years.

Summary

The patient presented in this report had a rare tumour occurring in a situation suggestive of a radiation-induced mesenchymal neoplasm. Attention is drawn to the need for prolonged follow-up in cases of squamous carcinomata of the larynx apparently disease free for many years following irradiation.

Acknowledgement

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