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Primary radiotherapy for treating all laryngeal cancer: a district hospital experience

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Abstract
We report our experience of long-term follow-up of all patients treated during a ten-year period with primary radiotherapy irrespective of the disease stage of their laryngeal carcinoma. This policy was adopted in order to allow all patients the opportunity to save their larynx and to preserve their voice. In the present literature, surgery is favoured for treating advanced disease.

Key words: Laryngeal neoplasms; Radiotherapy.

Introduction

The management of laryngeal squamous cell carcinoma includes the modalities of radiotherapy and surgery. There has been and continues to be considerable debate relating to the optimal treatment of this cancer, especially the T3 and T4 lesions. There are obvious attractions in preserving the larynx. However this cannot be justified if a significant number of patients proceed to a laryngectomy for either residual or recurrent disease. Radiotherapy failures requiring subsequent laryngectomy can delay salvage surgery and add to its morbidity.

Subjects

During the period 1975 to 1985, 101 patients were treated for laryngeal squamous cell carcinoma in the East Berkshire Health District. This Health District provides ENT services to a population of 370,000. Case notes were available on 85 patients (84.2 per cent). This is a retrospective study of these 85 patients.

Methods

All patients were initially seen by the ENT surgeons working at Wexham Park Hospital, where the ENT service for East Berkshire is based. The extent of the disease was assessed endoscopically and the diagnosis was confirmed histologically, in every case. Patients with pathology other than squamous cell carcinoma were excluded from this study. Subsequent management was planned at a weekly Joint Head and Neck Oncology Clinic, attended by both consultant ENT surgeons and a radiotherapy consultant from the Regional Radiotherapy Centre at Mount Vernon Hospital, Northwood. All patients received a regimen of 60 to 70 Gy megavoltage external beam therapy over a period of 6 to 7 weeks. A policy of routine biopsy six weeks following completion of radiotherapy existed and so presence of residual disease following treatment could be reliably assessed.

All patients were reviewed monthly in the first year, two-monthly in the second year, three-monthly in the third year, biannually in the fourth year and annually thereafter. We were fortunate to have access to both the ENT and radiotherapy case notes of all these patients. The results are based on careful scrutiny of these records.

Results

In the study period, there were 85 patients who were diagnosed histologically to have squamous cell carcinoma of the larynx. Of the 85 patients studied, 75 were male and 10 were female. The mean age at presentation was 63 with a range of 40 to 83 years (SD: 9.6). The ethnic profile comprised 80 patients of Caucasian and five of Asian background. The smoking habit of 73 patients was recorded, of these 66 were smokers.

At presentation, the symptom of longest duration was a 'hoarse' voice in 81 cases (95 per cent). The remaining four cases presented with one of the following symptoms: sore throat, stridor, haemoptysis and otalgia. The mean duration of hoarseness was 8.4 months, with a range of 1 to 48 months (SD: 9.58). The duration of hoarseness and the extent of tumour is shown in Table I, while the distribution of laryngeal sites involved is shown in Table II.

TABLE I

T stage	Number of patients	Mean duration (months)	Standard deviation
1	43	4.75	4.15
2	13	8.6	8.8
3	23	10.9	9.5
4	2	1.5	

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TABLE II

Site	Number of cases	%
Glottic	46	54
Supraglottic	9	11
Sub-glottic	1	1
Glottic + supraglottic	7	8
Trans-glottic	22	26

TABLE III

N0	80
N1	2
N2	2
N3	1

Table III shows the distribution of nodal involvement. There was no statistical difference in the degree of differentiation and the extent of the disease, as shown in Table IV.

Eight patients had second primary tumours: bronchogenic carcinoma (2 cases); tracheal SCC (1 case); tongue SCC (1 case); lip SCC (1 case); BCC of nose (1 case); BCC of eyelid (1 case); SCC of hand (1 case).

Forty-six patients with T1 lesion were treated with a radical course of radiotherapy. Of these, one had residual tumour and five had recurrent tumour, all within three years of initial treatment. They were all treated with salvage total laryngectomy. Two patients died of disease and five died of other medical causes. These patients were followed up to death. Two patients were lost to follow-up. The remaining 35 patients were followed up with a mean period of 9.8 years (range 5 to 17). Excluding the two patients lost to follow-up, this gives a survival rate of 94 per cent.

Of the fourteen patients with T2 disease, five had a recurrence within three years of completing their radiotherapy, two were treated with salvage laryngectomy, two by palliation and one patient was lost to follow-up. Three patients died of disease within three years of initial diagnosis. The remaining 11 patients were followed up for a mean period of 5.16 years (range 0 to 13). This represents a 78.5 per cent survival rate.

A total of 23 patients were treated for T3 lesions of the larynx, of which 19 went on to have either residual or recurrent disease. Thirteen were treated with salvage laryngectomy, six were treated with palliation. Eight patients died of disease and five died from other causes with no evidence of disease. The overall follow-up was for a mean period of 9 years (range 4 to 15). Ten deaths occurred in the first five years representing a survival rate of 56.5 per cent. Three further deaths occurred in the following five years representing a ten-year survival rate of 43.4 per cent.

Of the three patients presenting with T4 lesions, all had residual disease following radiotherapy. One patient was treated with a laryngectomy and two with palliation. The outcome of treatment along with subsequent management is illustrated in Tables V and VI.

TABLE IV

	Degree of differentiation			
T stage	Ca-in-situ	Well	Moderate	Poor
1	3	30	6	2
2	0	6	5	2
3	0	13	6	4
4	0	0	2	1

TABLE V

T stage	Total no. cases	No. treated with primary RT	No. with residual disease	No. with recurrence
1	46	46	1	5
2	13	13	0	5
3	23	22*	9	10
4	3	3	3	0

*One patient with a T3 lesion refused treatment.

TABLE VI

T stage	Total no. cases with residual or recurrent disease	No. treated with salvage total laryngectomy	No. treated with palliation
1	6	6	0
2	5*	2	2
3	19	13	6
4	3	1	2

*One patient with T2 disease was lost to follow-up.

Discussion

The majority of patients with laryngeal squamous cell carcinoma are treated with radiotherapy in the UK, as discussed by Robin and Olofsson (1987). This appears to be, appropriate to both T1 and T2 disease as shown by Stell *et al.* (1982). However, there is considerable debate regarding the use of radiotherapy as the sole primary form of treatment for T3 and T4 lesions. Radiotherapy is supported by Stell *et al.* (1982), Meredith *et al.* (1987) and Robson *et al.* (1990), amongst others. Primary surgery is particularly popular across the Atlantic, being advocated by Jesse (1974) and De Santo (1984), amongst others.

There is a large volume written on the management of this condition, but these reports appear to emanate mainly from the work of Teaching Hospitals. Our review is unique as it is based on the experience of a District General Hospital. Also, during the period 1975 to 1985 all patients with histologically proven squamous cell carcinoma were treated with primary curative doses of radiotherapy, with no regard given to the extent of the disease. Long-term follow-up was available on 87 per cent of the patients and 100 per cent of those with T3 and T4 disease. This allows us to address the question: 'is primary radiotherapy appropriate sole primary treatment for the T3 and T4 lesions?'.

In our review of T3 disease, we note an unacceptably high incidence of either recurrent or residual disease (82.6 per cent). Of these patients, 68.42 per cent went on to lose their larynx and endured the added morbidity associated with radiotherapy. Larynx preservation is the major attraction of a radiotherapy policy and this appears not to be possible in the majority of patients with a T3 lesion. However, what is even more disconcerting is that the remainder of the 31.58 per cent of patients were no longer deemed suitable for salvage surgery. It is possible that primary surgery may have prolonged their survival. This would support the views of other authors, such as De Santo (1984). The data published by Birmingham and West Midlands

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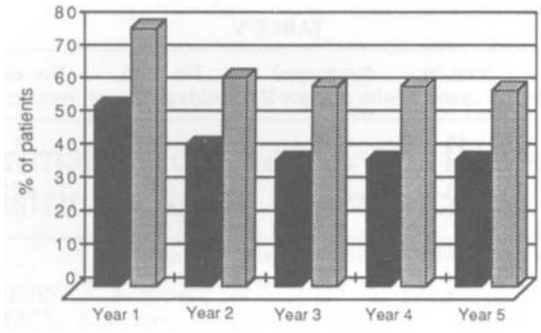

FIG. 1

Recurrence free rates (%) for T3N0M0 for radiotherapy and surgery as the primary treatment (1957–1976). Source: Birmingham and West Midlands Regional Cancer Registry, 1986. ■ = radiotherapy; ▩ = surgery.

Regional Cancer Registry (1986) is also convincing in support of surgery as the primary treatment of choice in the management of the T3 lesion of the larynx (Fig. 1).

It is not possible to draw statistically significant conclusions for the T4 patients as our numbers were limited to only three cases. The literature review appears strongly to suggest a poor cure rate with primary radiotherapy only, as discussed by Jesse (1974). Our three patients all experienced either residual or recurrent disease and so support the experience of other authors.

Our disappointing results of primary radiotherapy policy would make alternative forms of treatment well worth examining in all patients presenting with a T3 lesion. The viewpoint favouring radiation therapy would appear to offer the patient an inferior cure rate, causing some people to die so that others can preserve their lung powered glottic voice, as quoted by De Santo (1984). This long-held temptation can no longer be justified as the results of voice restoration using a prosthetic valve sited in a tracheo-oesophageal fistula offer a further alternative in achieving a lung powered pharyngeal voice, as shown by Singer and Blom (1980).

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