

Primary treatment of cancer of the larynx

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Abstract

Analysis of 3,445 cases of cancer of the larynx with a follow-up of 99.8 per cent shows that over a period in which the survival has improved neither the modality of the treatment nor the severity of the cancer has changed. Improved survival may be due to socioeconomic factors or an improvement in the quality of treatment.

Introduction

The treatment of cancer of the larynx has changed from surgery in the time of cancer of Kaiser Frederick (died 15 June 1888) to radiation initially in the form of implants and external radiotherapy using first orthovoltage and more recently megavoltage. Most recently, chemotherapy has entered the field. While there are general patterns of treatment in use, there is still no complete agreement on optimal treatment of certain tumours.

This paper has two purposes. The first is to show how a very large group of cases of cancer of the larynx has been treated over a period of 25 years—this as a matter of observation—almost an audit, but with no intent to judge the choice of treatment, which reflects the ‘average’ medical opinion of the time. The second is to evaluate the results of that treatment and to draw conclusions from the retrospective evaluation.

Material and method

A survey was made of all 3,445 cases of cancer of the larynx recorded at the Birmingham and West Midlands Regional Cancer Registry (BRCR) from 1957–1981 inclusive, a period of 25 years. Each of the 3,445 cases was validated by examining the clinical records. Histology was available for 92.8 per cent of cases but all of the remainder were cases proven by observation of behaviour, metastasis, and/or post-mortem examination. Any uncertain cases were excluded by a panel of clinicians. Each case was assessed, assigned to its classified site and subsite (supraglottis, glottis and subglottis, and mostly to the detailed site such as anterior commissure, false cord, etc) and staged according to the TNM system (UICC, 1978). Each case was followed-up prospectively

for at least five years. The study did not include cases registered after 1981, and the study was terminated to allow a full five year follow-up to 1986. The subsequent two years were required to enable all the information including that from the office of the Registrar General of Births and Deaths to be recorded and collated. Thus, over a quarter of a century has been achieved, making one of the largest detailed collections in the world. Only four cases were lost to follow-up, making the follow up rate 99.88 per cent.

The BRCR is one of only a very few registries world wide which has been population based for so long, and which also achieves a registration of more than 95 per

TABLE I
TYPE OF PRIMARY TREATMENT BY SEX

	Males %	Females %	Persons %
Radical radiotherapy	63.5	58.1	62.9
Radical R.T. + tracheostomy	9.6	15.8	10.3
Palliative radiotherapy	2.3	2.8	2.4
Palliative R.T. + tracheostomy	1.3	3.1	1.5
Laryngectomy	11.1	11.1	11.1
Partial laryngectomy	1.3	0.0	1.1
Excision biopsy	1.6	0.7	1.5
Radical R.T. + resection	1.9	0.7	1.8
Radical R.T. + node dissection	0.1	0.0	0.1
Palliative R.T. + resection	0.0	0.0	0.0
Palliative R.T. + node dissection	0.0	0.0	0.0
Chemotherapy	0.1	0.2	0.1
Tracheostomy	1.2	0.9	1.2
No treatment	6.0	6.4	6.0
Total	100.0	100.0	100.0
Number of patients:	3000	423	3423

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TABLE II
TYPE OF TREATMENT BY SITE

	Supraglottis %	Glottis %	Subglottis %	Larynx site not specified %
Radical radiotherapy	56.8	71.6	34.0	20.5
Radical R.T. + tracheostomy	16.3	7.0	20.8	10.0
Palliative radiotherapy	6.1	0.7	2.8	2.8
Palliative R.T. + tracheostomy	2.4	0.8	4.8	2.4
Laryngectomy	9.6	10.4	25.7	15.2
Partial laryngectomy	0.2	1.7	0.0	0.5
Excision biopsy	0.4	2.2	0.0	0.5
Radiotherapy + resection	2.6	1.5	2.1	0.9
Radiotherapy + node dissection	0.3	0.1	0.0	0.0
Chemotherapy	0.1	0.1	0.0	0.5
Tracheostomy	0.5	0.8	3.5	6.2
No treatment	4.7	3.1	6.3	40.5
Total	100.0	100.0	100.0	100.0
Number of patients:	939	2130	144	210

TABLE III
SUPRAGLOTTIS: TYPE OF TREATMENT BY STAGE

	No, Mo				
	T ₁ + T ₂	T ₃ + T ₄	N ₁₋₃ Mo	M1	Not staged
Radical radiotherapy	72.8	47.6	53.0	0.0	28.5
Radical R.T. + tracheostomy	14.0	25.3	12.0	12.5	19.0
Palliative R.T. ± tracheostomy	2.1	6.1	13.5	56.3	16.7
Laryngectomy	5.4	14.0	11.4	0.0	9.5
Partial laryngectomy	0.3	0.0	0.3	0.0	0.0
Excision biopsy or other surgery	0.6	0.0	0.3	0.0	2.4
Radiotherapy + resection	0.6	3.9	3.8	0.0	2.4
Radiotherapy + node dissection	0.0	0.0	0.3	0.0	4.8
Other or no treatment	4.2	3.1	5.4	31.2	16.7
Total	100.0	100.0	100.0	100.0	100.0
Number of patients:	335	229	317	16	42

TABLE IV
glottis type of treatment by stage

	No, Mo				
	T ₁ + T ₂	T ₃ + T ₄	N ₁₋₃ Mo	M1	Not staged
Radical radiotherapy	84.7	39.2	43.8	0.0	38.0
Radical R.T. + tracheostomy	3.2	19.3	11.4	7.1	6.0
Palliative R.T. ± tracheostomy	0.5	2.7	6.7	21.5	2.0
Laryngectomy	4.5	26.3	23.8	7.1	22.0
Partial laryngectomy	2.4	0.0	0.0	0.0	0.0
Excision biopsy or other surgery	2.9	0.5	0.0	0.0	0.0
Radiotherapy + resection	0.3	5.0	2.9	7.1	2.0
Radiotherapy + node dissection	0.0	0.0	1.9	0.0	0.0
Other or no treatment	1.5	7.0	9.5	57.2	30.0
Total	100.0	100.0	100.0	100.0	100.0
Number of patients:	1520	441	105	14	50

TABLE V
SUBGLOTTIS: TYPE OF TREATMENT BY STAGE

	No, Mo				
	T ₁ + T ₂	T ₃ + T ₄	N ₁₋₃ Mo	M1	staged
Radical radiotherapy	53.6	23.3	21.4	0.0	20.0
Radical R.T. + tracheostomy	19.6	23.3	28.6	0.0	10.0
Palliative R.T. ± tracheostomy	1.8	3.3	42.9	50.0	0.0
Laryngectomy	17.8	43.4	0.0	0.0	10.0
Radiotherapy + resection	1.8	1.7	0.0	0.0	10.0
Other or no treatment	5.4	5.0	7.1	50.0	50.0
Total	100.0	100.0	100.0	100.0	100.0
Number of patients:	56	60	14	4	10

cent of cancers at the same time recording detailed clinical information. It can claim to be one of the leading registries in the world, as instanced by a very low rate of 'unspecified' laryngeal cancer (6.1 per cent).

The population base is derived from the censuses of 1961, 1971 and 1981 with changes calculated over the intervening quinquennia, and all further calculations have been based on this (Registrar General 1961, 1971, 1981).

While 3,445 cases make up this series, not all cases had sufficient information to stage, or having been staged, to assign to a treatment category. Analyses will therefore be of numbers less than the total.

Results

Type of treatment

Table I shows that 73 per cent of cases had radical radiotherapy, nearly 14 per cent had surgery, no more than two per cent had combined treatment, five per cent had palliation only, and some six per cent had no treatment at all. Chemotherapy was practically unknown. Men and women attracted similar treatment. Radiation, therefore, was the mainstay of treatment within this period, during which the five year survival (Robin *et al.*, 1989) was over 50 per cent.

The same analysis can be made separately of the supraglottis, glottis, and subglottis (Table II). Since the treatment of women differs little from that of men, both have been combined. Surgery has been used for the subglottis most and for the supraglottis least.

Trends of treatment

We analysed by quinquennium the treatment during the 25 years under survey. We (Robin *et al.*, 1989) found some wide variations in the proportion treated surgically (i.e. those treated by primary laryngectomy, partial laryngectomy, excision biopsy or radical radiotherapy with concurrent planned surgery). There is no clear trend suggesting that there had been any major change in treatment policy. This means that the appropriate cases had been offered the appropriate treatment according to the medical opinion in the region at this time. We have previously shown that there has been no measurable change in the size or extent of tumours by TNM stage and proportions have remained constant (Robin *et al.*, 1989). We have also shown that the overall survival of cancer of the larynx has improved during the same period (Robin *et al.*, 1989). During this period, however, orthovoltage treatment was upgraded to megavoltage either by linear accelerator or by cobalt 60. Similarly surgery became safer and thus more successful.

Selection of treatment

The stage of the tumour seemed to be the major criterion for selection of treatment (Tables III and IV). T₃ and T₄ attracted more surgery than T₁ or T₂. Surgery was most frequent in the subglottis at whatever stage, again a reflection of the thinking of the time (Table V).

Two hundred and ten cases did not have their site adequately specified (Table I). For this group surgery

was undertaken as frequently as in other groups. However, the fact that no treatment was given in 40 per cent is an indication of the relatively advanced stage and hopelessness of this group. The only material change over the period of time was the smaller number of unspecifiable cases (reducing from 11.2 per cent in 1957–61 to 3.1 per cent in 1977–81) indicating a greater quality of observation, reporting, staging and probably treatment.

Discussion

To evaluate the achievements in management of cancer of the larynx we are forced to use retrospective surveys. There are yet no useful prospective studies, other than small selected groups (O'Connor *et al.*, 1982) and they are not yet giving positive results. Always a problem in retrospective studies is the difficulty in standardizing the material surveyed. In this paper we have tried to build on earlier publications, where we have shown a rising incidence of cancer of the larynx especially in women (Robin *et al.*, 1989) but no significant alteration in the severity of the cancer, i.e. the TNM staging remains in constant proportion (Robin *et al.*, 1989). In addition, we have been able to show an improvement in survival. In this paper we have shown that the treatment policies have not altered despite the evolutionary development of radiotherapy machinery, coupled with improvement in surgical and radiotherapy techniques. Interestingly surgery has been used no more frequently (perhaps just a little less with the increasing rarity of partial laryngectomy in the glottis) but we observed that operative mortality (death within one month) has, as in other fields of surgery, fallen. This series precedes the chemotherapy era. It is reasonable therefore, to draw the conclusion that the improving survival is due either to factors relating to the patient (e.g. socioeconomic) and/or to slightly more efficacious treatment—but not to earlier diagnosis nor to a change in the disease.

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