

Audit Article

A ten year audit of the management of cancers of the larynx and pharynx

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Abstract

The Chief Medical Officers' expert advisory group (The Calman Hine report (1994) for the commissioning of cancer services suggested that services in the district general hospitals (DGH) should be called 'cancer units' and that such units should be closely linked to 'cancer centres'. The objective of these proposals would be to improve the quality of care to cancer patients. The report also acknowledges that these proposals are based on an inadequate understanding of the epidemiology of cancer within England and Wales and the way in which current configuration of services affects outcome. The authors make a plea for better documentation and recording of treatment and outcomes (i.e. audit) to fill this gap. Registration in cancer registries is of limited value in assessment of outcomes of care owing to lack of detail. This paper describes an audit of head and neck cancer in one department and attempts to define which patients might benefit from referral from the cancer units to the 'centres', and conversely, which patients would be better managed in the cancer units. If *all* patients with cancer of the head and neck were referred, the service in the cancer centres would be overwhelmed. Some system of triage will therefore be essential.

Key words: Head and neck neoplasms; Evaluation studies

Introduction

It has been suggested that *all* head and neck cancer patients would benefit from referral to a specialist centre. No evidence for such a drastic reorganization of the present system has yet been provided but the argument rests on the reasonable assumption that surgeons doing a particular procedure regularly will provide better results than those doing the same procedure occasionally. In addition, the aggregation of a large number of patients in a single unit provides opportunities for teaching, research and development. On the other hand many patients do not require major surgical treatment and might well prefer treatment to be provided reasonably close to their homes in smaller units. Care of many head and neck cancer patients is not a matter of a single episode but of continuous care and monitoring over months and years. DGH consultants form working relationships with the GPs and the district nurses who form the first line of support for the patients' families. Many patients will not be curable even by the most advanced modern treatment and for such patients care will be supportive rather than curative

and may follow a very protracted course. A significant number of such patients, although not 'cured' from their head and neck tumour, may nevertheless survive long enough to require treatment for another unrelated disease. For such patients, familiarity with the local DGH will be a positive advantage. The element of teaching and research present in teaching hospitals may introduce factors into the decision to perform surgery which are not necessarily in the best interests of the individual patient, and these factors are not present in the DGH. The question therefore is where the best balance between the DGH and centre may be. Which patients will benefit from transfer to the centres and which will be better managed in the cancer units in the DGH? The solution to this question must lie in closer liaison between DGH consultants and the teaching centres. This can only be achieved by adequate sharing of data between the two. This paper describes a method of data collection which allows such a communication network to be set up, and the work of both the units and the centres to be monitored.

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Method

Since 1985 this department has collected records prospectively on all patients suffering from cancers of the upper aerodigestive tract. The coding system used for the primary tumour was according to the UICC classification of malignant tumours (1987) which is identical to the American joint committee on cancer classification (1992). However the staging of the nodes was done according to the system at that time prevailing which uses the concept of fixation of nodes, a method which has now been superseded (although not necessarily improved). Scanning was not routinely applied to the staging process during the period of the study although this is now routine for larger tumours, particularly as the staging system requires measurement of the dimensions of the tumour, a measurement which can only be approximate using naked eye examination down an endoscope. The figures are thought to be accurate in terms of capture of all the cases presenting in this health district, and they have been checked against the cancer registry figures held in Manchester. Tumours related to the specialty of maxillofacial surgery have been included for interest as if not treated in the cancer units these patients would all have to be transferred to the centres with consequent resource implications. However, the maxillofacial cases have not been analysed with respect to outcome. Those tumours arising posterior to the anterior pillars of the fauces are deemed to be 'ENT', and those arising in front of the anterior pillars are regarded as maxillofacial. In addition to the details of the tumour, the dataset also included treatment detail and follow-up data.

The population and the services currently provided

The department serves a population of 220,000 which is mainly Caucasian with only small representation from other ethnic groups and is relatively stable in terms of immigration/emigration. For the purposes of radiotherapy the population was served during the period of this study by the Christie hospital Manchester, which is a journey of 50 miles each way. For outpatient radiotherapy appointments the patients were seen at 'outreach' clinics in the local hospitals in joint clinics with the ENT and maxillofacial surgeons. Chemotherapy is prescribed if appropriate by a consultant oncologist based in Lancaster although some chemotherapy adjuvant to radiotherapy was administered during the course of this study by the radiotherapy team at Christie. The details of this are not presently available. Facilities for terminal care are available if required in a local hospice setting. Speech therapy and MacMillan nursing are available locally and are co-ordinated with the activities of the department. The availability of specialist oncology services, specialist nursing care, speech and language therapy and specialist terminal care is specifically mentioned as it is sometimes incorrectly suggested that these amenities can only be provided by cancer centres.

Data

Between January 1986 and December 1995 a total of 294 cases of head and neck cancer were recorded. There were 97 females and 197 males, a ratio of 2:1. One hundred and forty-five patients were over 70 at the time of presentation and this represents nearly half of all the cases. Fifty-four patients were over 80 years of age. The age of the patients and their general medical condition clearly has implications for the type of treatment offered and the place in which it is appropriate to offer it. This report refers in detail only to tumours of the glottis, supraglottis, oropharynx and hypopharynx, numbering 160 in total. The stage at presentation, the node status, the treatment and the outcomes are shown in the tables. It is not possible to make any judgement as to whether these results compare favourably with other centres or not as no comparable data has yet been published. All the cases recorded here are new cases and were all resident within the local catchment area at the time of diagnosis. The other tumours (numbering 134) are not analysed further here.

Staging

The TNM system is both difficult to apply and inherently inconsistent and this probably accounts for the fact that in the Scottish Otolaryngology Audit (Blair and McKerrow, 1994) a T stage was recorded in only two thirds of case notes. Inconsistency arises for example in respect to the size of tumours. A T2 oropharyngeal tumour may be up to 4 cm in diameter whereas a tumour of this size in the larynx would inevitably be T4. To extrapolate from the TNM classification system to a system of staging is to compound the problem. If the T classification is approximate, and the N classification is also approximate, then to extend this into staging is to create an illusion of accuracy where none exists. The staging system has not therefore been used here.

Glottis (Table 1)

Nodal metastasis is uncommon for primaries in the glottis, only 1/66 in this series (two per cent). In nine cases the data was not recorded. Five patients underwent total laryngectomy as the initial treatment; subsequently one patient required salvage laryngectomy (6/66 = nine per cent laryngectomy rate). Two block dissections were performed during the follow-up period one of which proved to contain no tumour on histology. Salvage surgery is therefore required infrequently in this group. Voice rehabilitation in the laryngectomees was poor. Two patients had no voice, two used a vibrator with modest success and one is using a Provox valve successfully. In one patient the data on voice is missing. Complications of radiotherapy included three patients with bilateral vocal fold palsy requiring permanent tracheostomy. A fourth patient would have required tracheostomy had he been normally mobile but as his mobility was severely restricted by a CVA and hemiplegia a tracheostomy was avoided.

TABLE I

ANALYSIS OF ALL NEW CASES OF GLOTTIC CARCINOMAS ACCORDING TO T CLASSIFICATION, NODE STATUS, TREATMENT AND OUTCOME OVER A 10-YEAR PERIOD FROM 1986 TO 1995. N = 66

| <i>Glottis</i> | <i>Total</i> |
|------------------------------|--------------|
| T class | |
| 1 | 37 |
| 2 | 18 |
| 3 | 8 |
| 4 | 1 |
| (blank) | 2 |
| <i>Node status</i> | |
| Mobile unilateral | 1 |
| No nodes | 56 |
| (blank) | 9 |
| <i>Treatment description</i> | |
| DXR | 58 |
| Palliative | 3 |
| Surgery | 4 |
| Surgery + DXR | 1 |
| <i>Fate</i> | |
| Not known | 1 |
| Died of index disease | 6 |
| Died of non-index disease | 9 |
| Cured (5 years) | 32 |
| Other | 1 |
| Under observation < 5 years | 17 |
| Total no. of patients | 66 |

Supraglottis (Table II)

Eleven patients underwent primary laryngectomy and four patients required salvage laryngopharyngectomy following 'failed' radiotherapy (15/25 = laryngectomy rate of 60 per cent). Nodes were present at the outset in five out of 25 (20 per cent) (two cases not recorded). Four patients required neck dissection at the outset and two patients required block dissection during the follow-up period. Radiotherapy was given with palliative intention in the T4 tumours ($n = 7$). Voice

TABLE II

ALL NEW CASES OF SUPRAGLOTTIC CARCINOMA RECORDED. N = 25

| <i>Supraglottis</i> | <i>Total</i> |
|------------------------------|--------------|
| T class | |
| 1 | 4 |
| 2 | 8 |
| 3 | 6 |
| 4 | 7 |
| <i>Node status</i> | |
| Fixed unilateral | 2 |
| Mobile bilateral | 1 |
| Mobile unilateral | 1 |
| No nodes | 18 |
| Node innocent | 1 |
| (blank) | 2 |
| <i>Treatment description</i> | |
| DXR | 13 |
| Palliative | 1 |
| Surgery | 11 |
| <i>Fate</i> | |
| Not known | 1 |
| Died of index disease | 16 |
| Died of non-index disease | 3 |
| Cured (5 years) | 2 |
| Under observation < 5 years | 3 |
| Total no. of patients | 25 |

rehabilitation in this group was poor; in cases where a note about voice was kept, nine were recorded as 'no voice'. One patient had a Blom Singer valve which proved unworkable and was removed. This patient developed worthwhile oesophageal voice. One other patient developed good oesophageal voice and one patient developed reasonable skill with a vibrator. Swallowing was reported to be poor in two cases and two other cases underwent gastrostomy. Complications included one post-operative fistula which closed spontaneously and one chyle fistula which also closed spontaneously.

Hypopharynx (Table III)

Seven patients underwent initial surgery to the primary only and a further six underwent initial surgery which included both laryngopharyngectomy and block dissection. One patient had combined surgery and radiotherapy. Nodes were present in 14 cases out of 34 (50 per cent) in this group. In four cases there was no record. Twelve patients were treated by primary radiotherapy and of these one subsequently underwent laryngopharyngectomy alone, one had combined laryngopharyngectomy and block dissection, one had both sides of the neck dissected (at separate times), and seven patients were unsuitable for any substantive treatment to be offered. (Operation rate 16/35 = 45 per cent.) One patient developed stridor after radiotherapy which required tracheostomy. Details of rehabilitation in this group are unfortunately very limited but only eight patients were alive at the time of the study, of whom four were within the five year follow-up period.

TABLE III

NEW CASES OF CARCINOMA OF THE HYPOPHARYNX. N = 34

| <i>Hypopharynx</i> | <i>Total</i> |
|------------------------------|--------------|
| T class | |
| 1 | 6 |
| 2 | 14 |
| 3 | 10 |
| 4 | 3 |
| (blank) | 1 |
| <i>Node status</i> | |
| Fixed unilateral | 1 |
| Mobile bilateral | 2 |
| Mobile unilateral | 6 |
| No nodes | 16 |
| Node innocent | 5 |
| (blank) | 4 |
| <i>Treatment description</i> | |
| CXT | 1 |
| DXR | 16 |
| Palliative | 5 |
| Surgery | 10 |
| Surgery + DXR | 2 |
| <i>Fate</i> | |
| Not known | 1 |
| Died of index disease | 22 |
| Died of non-index disease | 3 |
| Cured (5 years) | 4 |
| Under observation < 5 years | 4 |
| Total no. of patients | 34 |

Oropharynx (Table IV)

Seven patients underwent primary surgery of whom four had a simultaneous block dissection. Thirteen cases out of 35 (33 per cent) presented with nodes in the neck. Rescue surgery was required in six patients of whom one had resection of the primary only; three had combined primary and neck resections and two had neck dissection only (Operation rate 11/35 = 31 per cent). Complications in this group were relatively few, mainly palsy of one or more cranial nerves by local spread of the disease.

Neck (Table V)

The system of node classification is the system recommended by the 3rd edition of the UICC TNM classification and not the present system. The previous system is as follows:

1 = probably not significant as assessed clinically; 2 = mobile unilateral; 3 = fixed unilateral; 4 = mobile bilateral; 5 = fixed bilateral.

Treatment of the neck. Prophylactic neck dissection did not form part of the treatment policy in this department at the time of the study. Likewise selective neck dissection was not practised at that time. No patient in the glottic group had neck dissection as part of the initial surgery but one patient in this group had a 'salvage' dissection. Equivalent figures in the other groups were: four patients plus one in the supraglottic group; six plus two in the hypopharyngeal group; and three plus seven in the oropharyngeal group (one bilateral). In 19 cases (of the series of 35 patients treated surgically as an initial procedure) neck dissections were included as part of the initial operation (12 per cent of the total series of 160); nine patients required block dissection subsequently during the course of

TABLE IV

ALL NEW CASES OF OROPHARYNGEAL CARCINOMA. N = 35

| Oropharynx | Total |
|------------------------------|-------|
| <i>T class</i> | |
| 1 | 13 |
| 2 | 16 |
| 3 | 2 |
| 4 | 4 |
| <i>Node status</i> | |
| Fixed bilateral | 1 |
| Fixed unilateral | 4 |
| Mobile unilateral | 8 |
| No nodes | 20 |
| (blank) | 2 |
| <i>Treatment description</i> | |
| CXT | 1 |
| DXR | 23 |
| Palliative | 4 |
| Surgery | 7 |
| <i>Fate</i> | |
| Not known | 1 |
| Died of index disease | 14 |
| Died of non-index disease | 4 |
| Cured (5 years) | 2 |
| Under observation < 5 years | 14 |
| Total no. of patients | 35 |

TABLE V

NECK DISSECTIONS PERFORMED AS PART OF TREATMENT

| | Initial | Subsequent | Total |
|--------------|---------|------------|-------|
| <i>Neck</i> | | | |
| Glottis | 0 | 1 | 1 |
| Supraglottis | 4 | 2 | 6 |
| Hypopharynx | 6 | 2 | 8 |
| Oropharynx | 3 | 7 | 10 |
| Total | 13 | 12 | 25 |

TABLE VI

OPERATIONS FOR RESECTION OF THE PRIMARY TUMOUR

| | Initial | Subsequent | Total |
|----------------|---------|------------|-------|
| <i>Primary</i> | | | |
| Glottis | 5 | 1 | 6 |
| Supraglottis | 11 | 4 | 15 |
| Hypopharynx | 12 | 2 | 14 |
| Oropharynx | 7 | 4 | 11 |
| Total | 35 | 11 | 46 |

their treatment. Two necks were histologically negative. There were two cases of chyle fistula post-operatively which closed without further surgery. Many cases had more or less morbidity from pain and stiffness either in the neck or in the shoulder or both, and loss of normal sensation was always a problem.

Overview of surgical procedures (Table VI)

Analysis of the surgical procedures carried out during the 10-year period on the larynx and hypopharynx shows that there were 28 major resections performed as an initial treatment in this series of 125 (= 22 per cent) and seven resections performed as 'rescue' procedures. The total number of resections of the primary site was therefore 35 or 28 per cent. Ninety patients retained their larynx.

Palliative treatment. Details of palliation have not been recorded systematically and the importance of collecting this data has now been recognized. Ten patients were too unwell or had disease which was too far advanced for any treatment to be offered other than supportive. This figure for less-than-radical treatment does not include a much larger number of patients who underwent palliative radiotherapy. Analysis of the radiotherapy treatments has not been carried out but would be valuable for future studies.

Discussion

As far as can be determined this is the first time any attempt has been made to study the incidence, treatment and outcomes of malignant tumours of the pharynx and larynx on a population basis, a method which is recommended by the expert advisory group to the chief medical officer (the Calman Hine report). Blair and McKerron (1994) reported a survey carried out in Scotland into all the laryngeal cancers occurring during the calendar year of 1986. A total of 226 cases were recorded of whom 80 patients underwent total laryngectomy within two

years (35 per cent). In the Lancaster series there were 21 laryngectomies in a series of 91 laryngeal cancers (glottis, supraglottis and subglottis combined), an incidence of only 23 per cent. It is possible that this twofold difference is due to later presentation of tumours in Scotland, less effective radiotherapy or to a greater predilection to operate. Alternatively some hypopharyngeal tumours may have crept into the Scottish figures. No details are given for the staging of the tumours in the Scottish series.

Edwards *et al.* (1997) conducted a survey of consultants treating cancer of the head and neck in 1996 and reported that 919 consultants treated 6500 new cases per year, an average caseload of fewer than 10 cases per consultant. These authors suggest that the number of consultants treating these tumours should be reduced but give no guidance to suggest how the balance of work between centres and units should be struck. Much work has been done on how best to treat a given type of tumour but no data is available as to when such treatment should be given and when it should be modified or withheld. In spite of the benefits of advances in surgical and radiotherapeutic techniques, the result of treatment for many malignancies in the upper aerodigestive tract, apart from those confined to the glottis, remains poor. Too many of these tumours present at an advanced stage at which palliation is the only realistic approach to treatment. In addition the patients are often at an advanced age and either unwilling or unfit to undergo radical treatment.

It has not been possible in the present audit to measure quality of life following diagnosis but this would be a major step forward in the planning and provision of services. These data suggest that patients fall into three broad groups. Firstly there are those with early, very small, tumours (mainly glottis) who do well with radiotherapy. It is difficult to see how the management of these patients can be improved by transfer to a centre unless it is shown in the future that laser treatment offers the same or better results. Biopsy, CT scanning and other work up for radiotherapeutic purposes can be done equally well in the cancer units and local follow-up is certainly more appropriate. Secondly there are the very elderly and infirm for whom radical treatment is inappropriate. Again the management of this group would be more appropriately carried out locally. Thirdly there is a group of patients in their middle age with T3 or T4 tumours for whom radical surgery with adjuvant radiotherapy offers a significant prospect of survival. It is this (relatively less numerous) group who require transfer to specialist centres for treatment although some diagnostic and follow-up work could quite well be managed locally. The challenge lies in identifying these patients and creating good liaison between the centres and the units so that the patient can have confidence that the two parts of the system work together as a team. Therapeutic trials can be performed by entering patients locally and collating the data nationally. This does not require all patients to be physically

transferred to a cancer centre. Current literature concentrates on five-year survival figures but palliation and quality of life issues have become an increasing concern in head and neck oncology and there is no doubt that provision of services close to the patient's home is of significant benefit in qualitative terms. Audit figures such as these are essential to provide information on which to assess the quality of the care provided in individual departments. The present study attempts to define which subpopulation within the whole group would benefit most from transfer to the cancer centre, and conversely, which cases are best treated locally in the cancer units.

Morton (1996) has rightly drawn attention to the importance of quality of life assessment in ENT and in cancer surgery in particular. In our own series the number of laryngectomees acquiring useful voice after surgery was small. This was not because of any lack of commitment on behalf of the surgical team but because of the advanced age and lack of motivation of many of the patients and the presence in some patients of coexisting bronchitis. Equally, the measurement of shoulder function after block dissection has not been included as part of this audit but the figure for handicap would certainly be high. Swallowing is another vital function which fares badly. The availability of percutaneous gastrostomy has recently helped to provide hydration and nutrition, and has been a step forward in the palliation of these diseases which can be provided in the cancer units. Collection of all of this data on a district basis is essential but unlikely to be achieved unless there are committed ENT surgeons locally. For patients deemed suitable for palliation only, treatment should be as close to home as possible. The quality of the decision-making process can only be improved by attention to the kind of audit here presented.

Literature review

Although there is a dearth of data of the type described here there are some comparable studies. Jones *et al.* (1994) using a system of data collection initiated by Professor Stell and adopted here, have collected data on 3419 cases. It is not known whether this data is drawn entirely from within the catchment population of the Royal Liverpool Hospital or not. The data has not so far been analysed in a way which would allow direct comparison with the present data. Vernham and Crowther (1994) undertook a two-year prospective study of all those presenting for the first time to a single unit in Glasgow similar to the present one concluding that although highly desirable, the objective of making earlier diagnoses in the upper aerodigestive tract tumours was going to be difficult to achieve.

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Appendix Note on the classification of tumours and lymph node metastases

The N classification given here is that used before the new UICC classification of 1987. In the latter classification there is no place for an 'innocent' node and category 1 here would therefore now be properly reclassified as N1 along with most of category 2 and possibly a few of categories 3 and 4. The UICC classification includes all unilateral (same side) nodes of less than 3 cm diameter. N2 in the UICC classification includes all nodes between 3 and 6 cm in diameter whether ipsilateral single (N2a) or multiple (N2b), or bilateral or contralateral between 3 and 6 cm (N2c). N3 includes any lymph node metastasis greater than 6 cm in diameter. It has not been possible to extrapolate the present data into the new classification as measurement in centimetres can only be done reliably with the help of scans.

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