

Emergency laryngectomy

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Abstract

From 1974 to 1990, 31 patients underwent emergency laryngectomy for airway obstruction due to laryngeal carcinoma, in an effort to avoid the complication of stomal recurrence. This group of patients had a greater proportion of multiregional tumours (35 per cent vs 13 per cent) than a comparison group of elective laryngectomies. In other respects the two groups were similar.

Early post-operative mortality (6.5 per cent vs 3 per cent), stomal recurrence rates (4.2 per cent vs 4.8 per cent) and survival (53 per cent vs 55 per cent) were not significantly different between the emergency laryngectomy group and the comparison group undergoing elective laryngectomy.

Introduction

Obstruction of the airway by laryngeal carcinoma is difficult to treat. If the patient undergoes an emergency tracheostomy, later stomal recurrence is a dreaded potential complication. Keim *et al.*, (1965) defined stomal recurrence as a 'diffuse infiltrate of neoplastic tissue at the junction of the amputated trachea and the skin'. They found a stomal recurrence rate of 40.9 per cent in patients undergoing pre-operative tracheostomy, compared with only 6.1 per cent in those who did not. This condition is difficult to treat, and carries a dismal prognosis (Stell *et al.*, 1970). The high incidence of stomal recurrence has been used as a strong argument for emergency laryngectomy in preference to tracheostomy for the relief of airway obstruction in patients with laryngeal carcinoma. A laryngoscopy with frozen section biopsy is first performed. If the section shows carcinoma, a laryngectomy is then performed under the same anaesthetic. This procedure was first reported in 1954 by Hoover and King, although at this time their rationale was the treatment of the carcinoma and the airway obstruction at the same sitting; they were not concerned with the problem of stomal recurrence (Hoover and King, 1954). They carried out two emergency laryngectomies, with no hospital mortality and no stomal recurrence. Several groups have advocated emergency laryngectomy in an effort to avoid stomal recurrence (Bonneau and Lehman, 1975; Myers and Ogura, 1979; Wickham *et al.*, 1990) but only the last authors have reported a series of patients: none of their 13 patients suffered a post-operative death and none had a stomal recurrence. In 1971, we reported a stomal recurrence rate of 21 per cent in 19 patients undergoing tracheostomy before treatment (Stell and van den Broek, 1971). Thereafter we changed our policy to emergency laryngectomy, that is laryngectomy carried out within 24 hours of presentation, without a prior tracheostomy.

We now wish to report our results with this procedure.

Method

Between 1974 and 1990, 31 patients underwent emergency laryngectomy for airway obstruction due to laryngeal carcinoma, and 202 patients underwent elective laryngectomy. Data on these patients were extracted from the database of 4718 patients with tumours of the head and neck seen by one of us (PMS) between 1963 and 1990. The data were recorded at the time of presentation, initially on cards, and after 1977 on a microprocessor. The patient's tumour was classified by the latest UICC method (UICC, 1987) and their general physical condition by the ECOG status (AJC Manual 1990).

Follow-up and analysis of data

All patients have been followed up personally (PMS)

TABLE I
HOST FACTORS

	Emergency group	Elective group
Age (years)	63	58
Sex		
men	27	157
women	4	45
	$\chi^2_1 = 0.91, \text{N.S.}$	
ECOG SCORES		
0	23	82
1	4	33
2–4	1	4
Unrecorded	0	6
Prev. treatment elsewhere	3	77
	$\chi^2_2 = 2.15, \text{N.S.}$	

TABLE II
TUMOUR FACTORS

	Emergency group	Elective group
<i>Histological grade</i>		
Well differentiated	7 (23%)	55 (27%)
Moderately differentiated	10 (32%)	66 (33%)
Poorly differentiated	12 (39%)	48 (24%)
Ungraded	2 (6%)	33 (16%)
	$\chi^2_3 = 2.06, N.S.$	
<i>Site</i>		
Supraglottis	6 (19%)	80 (40%)
Glottis	8 (26%)	78 (39%)
Subglottis	6 (19%)	18 (9%)
Multiregional	11 (35%)	26 (13%)
	$\chi^2_3 = 15.67, p < 0.001$	
<i>T-stage</i>		
I	3	25
II	0	22
III	15	75
IV	10	62
χ	3	18
	$\chi^2_3 = 4.46, N.S.$	

and no patient has been lost to follow-up. The median potential follow-up is eight years (1–22 years). Adjusted life curves are presented and differences in survival are analysed by univariate methods using the log rank test (Peto *et al.*, 1976). Qualitative data are presented in contingency tables and subjected to chi squared analyses (with Yates correction for 2×2 tables). Confidence intervals are given where appropriate.

Results

1. Patients' data

The relevant host and tumour data are shown in Tables I and II. These show no significant differences in host factors, or histological grade, but a significantly higher incidence of multiregional tumours in the emergency group.

Eight patients (26 per cent) in the emergency group and 123 (61 per cent) in the elective group had undergone previous radiotherapy.

2. Perioperative mortality

The hospital mortality, that is death from any cause before discharge from hospital is shown in Table III. The higher incidence of perioperative deaths in the emergency group (6.5 per cent compared with 3 per cent) was not significant ($\chi^2_1 = 1.7$).

3. Stomal Recurrence

The cumulative stomal recurrence rate at five years in both groups considered together was six per cent. Furthermore stomal recurrence always developed within 30 months. Clearly the numbers are too small for analysis by the log rank test, and we analysed the number of stomal recurrences in all those at risk for three years or more. There were 6/165 (4.8 per cent) stomal recurrences in the elective group and 1/24 (4.2 per cent) in the emergency group. This difference was clearly not significant (Fisher's exact test $p = 0.78$).

Survival

The five-year survival of the group undergoing emergency laryngectomy was 53 per cent, and that of the elective group 55 per cent, a completely non-significant difference ($\chi^2_1 = 1.8$).

Discussion

In brief, our series shows that emergency laryngectomy is a feasible procedure. Only 4.2 per cent of our emergency laryngectomy patients suffered a stomal recurrence. This figure compares favourably with an average rate of 8.3 per cent quoted in the literature (Myers and Ogura, 1979) and 4.8 per cent in our elective group. It is certainly better than the rate of 21 per cent in our series before 1971. This has been achieved with a 3.5 per cent worse perioperative mortality than elective laryngectomy.

Furthermore, patients undergoing emergency laryngectomy have more advanced disease than those patients undergoing total laryngectomy: notably multiregional tumours are commoner. Thus patients undergoing emergency laryngectomy would be expected to have a worse outcome.

There are arguments against performing this type of surgery as an emergency. The patients are prepared for operation in a hurry, and it could be argued that they do not give truly informed consent. Furthermore, the histological diagnosis depends on a frozen section, the patient's general medical condition may be less than ideal, and psychological preparation may be poor. Yet our results are good and survival is similar to elective laryngectomy.

Peristomal recurrence has at least five different pathological causes: tumour implanted in the track of a tracheostomy, incompletely excised tumour, a second tumour arising in the tracheal epithelium, tumour in the paratracheal lymph nodes overlooked at the laryngectomy, and tumour tracking down within the sheath of the sternomastoid muscle. Only the first of these five can be affected by a policy of emergency laryngectomy. Furthermore, there is inevitably a morbidity and mortality associated with elective laryngectomy. It is difficult to understand why both stomal recurrence and mortality are completely eliminated by emergency laryngectomy in some series *e.g.* that of Wickham *et al.* (1990).

We would conclude on the basis of this evidence that emergency laryngectomy fulfils its promised role. It provides symptomatic and definitive treatment at the same time with no significant increase in the perioperative or long-term mortality, or stomal recurrence rate compared with that of elective laryngectomy.

It is likely that this procedure will largely be replaced

TABLE III
HOSPITAL MORTALITY

	Emergency group	Elective group
	$\chi^2_1 = 1.7 N.S.$	
Number	2/31	6/202
	Cause and timing (in days)	
Carotid rupture	6	Carotid rupture 11
Respiratory infection	14	Respiratory infection 12,32
		Heart attack 3,7
		Stroke 6

by debulking of the tumour by laser, but the efficacy of this method remains to be proven (McGuirt and Koufman, 1987).

Acknowledgements

The authors are grateful to the North West Cancer Research Fund for financial support and to Mrs Jill Deeprise and Mrs Brenda Cowley for the typing.

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Key word: Laryngectomy