

Stomal recurrence after total laryngectomy: a 10-year review in Universiti Kebangsaan Malaysia Medical Center

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Abstract

Objective: To determine the frequency of stomal recurrence in patients following total laryngectomy in our center and to compare the frequency of previously reported risk factors such as preoperative tracheostomy, subglottic invasion and the level of lymph node metastases, with the rest of the world.

Methods: Clinical records of patients with carcinoma of the larynx who presented to Universiti Kebangsaan Malaysia (UKMMC) Otorhinolaryngology and Oncology clinics between January 1998 and December 2007 were reviewed.

Results: A total of all 18 male patients who underwent total laryngectomy for carcinoma of the larynx within this 10 year period. The youngest patient was 49 years old and the eldest was 79 years old with mean age of 63±8 years. Twelve of them had a tracheostomy prior to surgery. Median duration from tracheostomy to definitive surgery was 28.5 days. Only 1 patient developed stomal recurrence.

Conclusion: The duration from tracheostomy and total laryngectomy was longer than what is accomplished in the developed countries but the frequency of stomal recurrence was still comparable to the rest of the world. The frequency of other previously reported risk factors namely subglottic invasion and lymph nodes metastases were comparably low.

Keywords: Stomal recurrence, Tracheostomy, Subglottic invasion, Lymph node metastases, Universiti Kebangsaan, Malaysia (JPMA 62: 466; 2012).

Introduction

Stomal recurrences are diffuse tumour infiltrates at the junction of the trachea and skin following laryngectomy. It is a rare but well-recognized complication. The incidence of stomal recurrence reported in the literature ranges between 2% and 15%.^{1,2} It is associated with a very poor prognosis as these patients usually die from the progression of the disease despite aggressive surgery or radiotherapy. Factors that predispose patients to stomal recurrence include advanced T stage, N stage, subglottic involvement and preoperative tracheostomy especially patients with a primary laryngectomy.³

The purpose of this study was to determine the frequency of stomal recurrence in patients following total laryngectomy in Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and to compare the frequency of previously reported risk factors such as preoperative tracheostomy, subglottic invasion and the level of lymph node metastases in the development of stomal recurrence,

to the rest of the world.

Patients and Methods

A retrospective review of all total laryngectomies performed between January 1998 and December 2007 in Universiti Kebangsaan Malaysia Medical Centre was carried out. Details of particular interest were size and site of tumour, evidence of cervical lymphadenopathy, whether a pre-laryngectomy tracheostomy was performed, the time interval between tracheostomy and definitive surgery and whether pre- or post-operative radiotherapy was given. Types of voice rehabilitation that were carried out were also reviewed.

Patient demographic data were documented and details regarding clinical presentation, adjunct neck dissection or thyroidectomy, histopathological examination results and outcome were also recorded.

Results

A total of 18 male patients underwent total

Table: Demographic data, Clinical features of the tumour and whether or not Pre-laryngectomy tracheostomy was performed in the study patients.

Patient	Sex	Age	Race	Subsite	T	N	M	Pre-Laryngectomy Tracheostomy
1	Male	49	Chinese	transglottic	4	2c	0	
2	Male	70	Chinese	transglottic	4	1	0	
3	Male	56	Chinese	transglottic	4	2c	0	Yes
4	Male	71	Malay	transglottic	3	0	0	
5	Male	61	Chinese	supraglottic	4	0	0	Yes
6	Male	53	Chinese	transglottic	4	2c	0	Yes
7	Male	67	Malay	glottic	3	0	0	
8	Male	63	Chinese	supraglottic	4	1	0	Yes
9	Male	63	Chinese	transglottic	3	2b	0	Yes
10	Male	52	Indian	subglottic	4	0	0	Yes
11	Male	56	Chinese	glottic	4	0	0	Yes
12	Male	79	Indian	transglottic	3	0	0	
13	Male	70	Chinese	supraglottic	4	2c	0	Yes
14	Male	62	Malay	transglottic	4	2c	0	Yes
15	Male	64	Chinese	transglottic	3	0	0	
16	Male	63	Chinese	transglottic	4	0	0	Yes
17	Male	76	Chinese	transglottic	4	1	0	Yes
18	Male	72	Chinese	transglottic	4	2c	0	Yes

*The highlighted patient developed stomal recurrence.

laryngectomy for carcinoma of the larynx between January 1998 and December 2007. None of our patients were female. Demographic data are shown in Table. The youngest patient was 49 years old and the oldest was 79 years with a mean age of 63±8 years. Thirteen patients were of Chinese descent (72%), 3 were Malay (17%) and 2 were Indian (11%). Almost, all patients presented with hoarseness with or without stridor. One also complained of dysphagia while another had associated exertional dyspnoea. Duration of the symptoms ranged from 2 to 36 months with mean duration of 12±10 months.

From the 18 laryngeal cancer patients, 12 (67%) were classified as transglottic, 3 (17%) were supraglottic, 2 (11%) were glottic and only 1 patient (5%) had subglottic carcinoma. There were 5 patients (28%) with T3 tumours and the rest were T4 tumours. Ten patients presented with at least N1 cervical lymphadenopathy and at most N2c with 6 patients (33%) as shown in Table 1. Twelve patients (67%) had tracheostomy done for airway relief prior to the total laryngectomy.

All 18 patients underwent total laryngectomy. Neck dissection was performed in 15 of these patients (83%). Total thyroidectomy was carried out in one patient (6%) while hemithyroidectomy was done in another patient (6%). On histopathological examination, one patient (6%) was found to have adenoid cystic carcinoma while the rest were squamous cell carcinoma, the majority being of well-differentiated type (56%). Ten (56%) patients had post-operative radiotherapy for positive surgical margins while one (6%) patient underwent post-operative chemoradiotherapy. Seven patients (39%) had no surgical margin involvement. Primary tracheo-esophageal puncture

(TEP) was carried out in two patients (12%) while ten (60%) had secondary TEP performed. Two (12%) other patients used an electrolarynx device.

One (6%) patient developed stomal recurrence Sisson's stage IV which was diagnosed 26 months after surgery. Exploration of the neck found tumour around the stoma, encasing the right common carotid artery, floor of mouth and extending laterally beyond the right clavicle. He was previously tracheostomised for a T4 supraglottic squamous cell carcinoma six days before his definitive surgery. Clinically there was no evidence of cervical lymphadenopathy and no distant metastases on further radiological investigations. He was subjected to total laryngectomy with left modified radical neck dissection, right selective neck dissection and left partial thyroidectomy. His histopathological report was a well differentiated squamous cell carcinoma with margin involvement. There was also involvement of the thyroid cartilage, thyroid capsule and gland for which he subsequently underwent radiotherapy. This patient had used an electrolarynx as a mode for speech recovery.

Discussion

Stomal recurrence in patients following total laryngectomy for carcinoma of the larynx is a rare but very serious complication. Most are diagnosed within the first year following the total laryngectomy but cases have been described to present at 3.5 years post surgery.⁴ It is associated with approximately 90% mortality with more than 80% of the patients dying in the first 24 months.⁵ Most of the patients die from the progression of the disease. It has been categorized by Sisson three decades

ago and this classification is known to correlate with the selection of appropriate management and outcome.⁶ Type I is localised disease at the superior aspect of the stoma and carries a good prognosis if detected early. Type II indicates oesophageal involvement but no inferior extension. Prognosis is fair depending on the amount of oesophagus involved. Type III originates from the inferior aspect of the stoma and usually has direct extension into the mediastinum. Type IV indicates a lateral extension beneath the clavicle. In the latter two groups, prognosis is poor if the great vessels are invaded with the tumour. Otherwise prognosis is fair. In our patient the tumour had extended laterally beneath the right clavicle and also encased the right common carotid artery, all of which bore a poor prognosis. The major risk factors for stomal recurrence that have been reported include preoperative tracheostomy, subglottic involvement, advanced tumour stage and nodal metastasis.^{1,7} Others include insufficient tracheal margins and thyroid invasion.⁴ These risks factors are also thought to be true only in patients with a primary laryngectomy.³ However, all these conclusions remain controversial.

It was well known that if preoperative tracheostomy was necessary for airway obstruction, an immediate laryngectomy should also be performed to decrease the chance of tumour cell implantation in the stoma.¹ The study by Keim et al is the most frequently cited in the laryngology literature where they reported a 14% incidence of stomal recurrence if laryngectomy was performed at the time of emergency tracheostomy compared to a 41% incidence if the laryngectomy was carried out more than 2 days after the tracheostomy.¹

A recent theory is that patients who require a preoperative tracheostomy have more advanced disease and may have a higher rate of occult paratracheal lymph node metastasis and thus preoperative tracheostomy increases the risk of stomal recurrence. This is supported by the finding of the strong correlation between preoperative tracheostomy and paratracheal lymph node metastasis.⁷ A recent study also found that the frequency of preoperative tracheostomy was often associated with airway obstruction in the presence of subglottic or transglottic tumours and advanced tumours with extensive infiltration.⁸ They found that the frequency of preoperative tracheostomy was far higher in their T4 subgroups than in their T2 and T3 subgroups but there was no significant difference in the incidence of stomal recurrence between the T3 and T4 subgroups. This implies that preoperative tracheostomy to relieve airway obstruction by itself would not predispose the patients to stomal recurrence in the absence of subglottic or transglottic tumours or the presence of advanced cancers. In our center over the 10

year study period, the mean duration from tracheostomy to laryngectomy was 48±36 days. In our patient who developed stomal recurrence, the time interval was six days. Our patient had a supraglottic T4 tumour but N0 neck and had needed a tracheostomy prior to laryngectomy for airway relief. Although there was no clinical evidence of neck disease, this does not rule out paratracheal lymph node metastases. A prospective study by Weber et al showed that more than half of his glottic carcinoma patients had paratracheal node metastases in the absence of cervical node metastases.⁹

Other studies have found that there was no significant difference in the development of stomal recurrence between the group having preoperative tracheostomy and the group without it.^{10,11} There was also no correlation between the time interval between tracheostomy and laryngectomy, and the incidence of stomal recurrence.¹⁰

Interestingly, molecular analysis such as detection of p53 gene mutation and pattern analysis of microsatellite markers have been carried out to distinguish a recurrence from a second primary tumour.¹² This differentiation is potentially valuable with regards to alternative therapeutic choices for patients with second primary tumours versus patients with recurrences. Further studies involving molecular characterization of primary tumours and recurrences are needed to clarify the mechanisms involved in the development of stomal recurrence.¹²

Aggressive surgical approach provides the best option for palliation or potential cure of stomal recurrence and a few reconstructive procedures have been used. Mediastinal tracheostomy has been the standard reconstructive procedure for patients who required extensive tracheal resection and have been suggested for type I-II stomal recurrence.¹³ More recently the use of free-tissue transfer has been introduced such as that from the radial forearm and anterolateral thigh.^{14,15} In unresectable advanced relapses of the Sisson's types III-IV, non-operative management involving chemoradiation or re-irradiation using intensity modulated radiotherapy should be considered.¹⁶ Prerequisites for it include the absence of distant metastases or significant medical disorders as well as good performance status. The use of postoperative prophylactic radiation has also been reported in the prevention of stomal recurrence.^{17,18} However, in our study, none of the patients were subjected to this. Our patient was diagnosed to have stomal recurrence 26 months after laryngectomy. He had advanced stomal disease which encased the right carotid artery and extended inferiorly beyond the right clavicle. For that reason he was decided for palliative stomoplasty

but was subsequently lost to follow up.

Conclusion

The survival of patients with stomal recurrence is discouraging despite aggressive surgical therapy or high-dose irradiation. The prognosis of patients is therefore very poor so identification of risk factors is essential to prevent its progression. In our centre, the frequency of stomal recurrence was comparable to the rest of the world despite late presentation of the patients and requiring a preoperative tracheostomy for airway obstruction from a T4 tumour. From the literature review, preoperative tracheostomy was recommended in patients with airway obstruction because it did not increase the risk of stomal recurrence.

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