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Stomal recurrence post laryngectomy in University College Hospital, Ibadan

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Summary

The outcome of laryngeal carcinoma is favourable and cure rate high if detected early. A major complication experienced post surgery for advanced laryngeal carcinoma is recurrence especially at the tracheostome. This study aimed at evaluating the incidence of stomal recurrence post total laryngectomy with respect to the risk factors. This is a retrospective review of eighteen patients (14 males and 4 females) that had total laryngectomy for histologically confirmed laryngeal carcinoma from 1990 – 2002. Seven patients (38.9%) had stomal recurrence. Seven patients (38.9%) had palpable deep cervical nodes at presentation. Fourteen (77.8%) and four (22.2%) patients had emergency and elective tracheostomy procedures respectively. Twelve patients (66.67%) had neck node dissection during surgery. Post-operatively, twelve patients (66.7%) had only radical radiotherapy; four (22.2%) had both radio-/chemotherapy while two had preoperative and additional post-operative radiotherapy. The mean duration between the pre-operative tracheostomy and total laryngectomy was 62.19 ± 64.56 days while the mean duration between total laryngectomy and development of stomal recurrence was 7.79 ± 8.57 months. Ten patients (55.6%) died, (seven with and three without stomal recurrence but who died of distant metastases to the lungs and thoracolumbar vertebral bodies). Stomal recurrence post laryngectomy has a grave prognosis. This present study also showed that advanced stage 3 and 4 tumour, transglottic involvement and the presence of preoperative tracheostomy are the likely risk factors that could be associated with recurrence in our environment. There is therefore the need to reevaluate these preventive measures in a prospective study in order to improve the final outcome in our environment.

Keywords: *Stomal recurrence, laryngectomy, tracheostomy, radiotherapy, Ibadan, Nigeria*

Résumé

Le résultat du carcinome laryngéal est favorable et le taux de traitement élevé si détecté tôt. La complication majeure de l'après chirurgie des cas avancés est la récurrence spécialement à la trachéostomie. Le but de cette étude était d'évaluer l'incidence de la récurrence stomale de la laryngectomie totale et les facteurs à risque. Cette revue retrospective de dix-huit patients (14 mâles et 4 femelles) souffrant de la laryngectomie histologiquement confirmée du carcinome laryngéal de 1991-2002. Sept patients (38.9%) avaient une récurrence, 38.9% également avaient des nœuds cervicaux profonds palpables à la

présentation. Quatorze (77.8%) et quatre (22.2%) des patients avaient besoin d'urgence nécessitant des procédures trachéotomiques électives respectivement. Après l'opération, 12 patients (66%) avaient une dissection du nœud du cou pendant la chirurgie alors que 66.7% avaient seulement la radiothérapie radicale. La durée moyenne entre la trachéotomie et la laryngectomie totale était de 62.19 ± 64.56 jours. Cependant la durée moyenne entre la laryngectomie totale et la récurrence de développement stomale était de 7.79 ± 8 mois. Deux patients mouraient des métastases distantes des poumons et des corps vertébraux thoracolumbaux. En conclusion, la récurrence stomale après la laryngectomie a une pronostic grave. Cette étude montre que les 3 étapes avancées et 4 tumeurs transglottiques et la présence de la trachéotomie pré-opérative sont des facteurs à risque qui pourraient être associés à la récurrence dans cet environnement. Ceci préconise de réévaluer les mesures préventives dans une étude prospective pour améliorer les résultats.

Introduction

Laryngeal carcinoma, an important Head and Neck tumour is highly preventable and has a relatively low incidence considering the predisposing factors [1]. The outcome is favourable and cure rate high if detected early. Total laryngectomy remains however a major radical surgical treatment for an advanced laryngeal carcinoma aimed at extirpating the disease. One of the major complications experienced post surgery is the recurrence of the disease especially at the tracheal opening. This has a dismal outcome and a mortality of nearly 100% [2-5]. This is mainly secondary to progressive tracheostomal obstruction or haemorrhage caused by erosion of major vessels in the neck.

The real pathogenesis of stomal recurrence still remains unclear, but neoplastic cell inoculation of the tracheal stomal wound and extension from paratracheal lymph nodes appear to be a partial explanation [2]. However, Yotakis *et al.* [3] suggested that submucosal extension and lymph node metastases are probably more important mechanisms than cancer cell implantation a view supported by Sato *et al.* [6] in their study of the cricoid area of the larynx.

This present study aimed at reviewing the incidence of stomal recurrence in patients that had total laryngectomy in the department of Otorhinolaryngology, College of Medicine, University College Hospital (UCH) Ibadan, the associated predisposing risk factors and to proffer some preventive and corrective measures.

Patients and methods

This is a retrospective review of thirty patients that had total laryngectomy for histologically confirmed laryngeal carcinoma in the Department of Otorhinolaryngology of the University

College Hospital, Ibadan between January 1990 and December 2002. However, due to poor record keeping, the medical case notes of eighteen patients were retrieved from the Medical Records Department for this review.

Data extracted included the age, sex, social habits, duration of symptoms at the time of presentation, indirect/direct laryngoscopy, UICC TNM staging and the surgical specimen staging/site of the lesion, interval between presentation and preoperative tracheostomy, its timing/type of anaesthesia given. Also extracted were the degree of differentiation of surgical specimen, interval between the preoperative tracheostomy and total laryngectomy, and interval between total laryngectomy and stomal recurrence, adjunct pre- or post radiotherapy after surgery and stomal recurrence, the final clinical outcome and the duration from onset of symptoms till death.

The data was analysed using the EPI-Info 2000 and SPSS for windows (version 6.1) and the results presented in simple descriptive and tabular form. Statistical significance ($P < 0.05$) and odd ratio/relative risk was based on Mantel-Haenszel and two-tailed Fisher exact respectively.

Results

This retrospective review of eighteen patients, consisting of fourteen males and four females, with a male to female ratio of 3.5 to 1, had an average age of 52.23 ± 10.31 years and a range of 28 – 70 years. Nine patients (50%) engaged in smoking and alcohol ingestion, four (22.2%) only took alcohol, one (5.6%) only smoked while four (22.2%) engaged in none of the social habits. There was high association between smoking and alcohol $P = 0.0041$ [weighted OR = 9.00 (1.84, 49.90) using Mantel-Haenszel]. Seven patients (38.9%) had evidence of stomal recurrence amongst the eighteen patients.

At presentation, all the patients had hoarseness while 2 (11.1%) and 15 (83.33%) had mild and severe stridor respectively. Seven patients (38.89%) had palpable deep cervical nodes at presentation. The mean duration of symptoms at presentation was 20.23 ± 15.53 months, with a range of 2 – 48 months. All the patients had preoperative tracheostomy and the mean interval between the time of presentation and the procedure was 55.4 ± 72.45 days and a range of 12 hours to 260 days. Fourteen (77.8%) and four (22.2%) patients had emergency and elective tracheostomy procedures respectively. There was no associated risk between the timing of the preoperative tracheostomy and the stomal recurrence, [using Fisher exact $p = 1.000$ (RR = 1.71 (0.28, 10.39))].

Twelve patients (66.67%) had neck dissection at total laryngectomy. Included in this were the seven patients with palpable cervical nodes at presentation and five who had suspicious cervical nodes at surgery. The mean duration between the preoperative tracheostomy and total laryngectomy was 62.19 ± 64.56 days with a range of 1 day to 240 days, while the mean duration between total laryngectomy and development of stomal recurrence was 7.79 ± 8.57 months with a range of 1 – 26 months in those that had it. Ten patients' (55.6%) surgical specimen showed transglottic involvement while eight had one or two sites involvement. All the surgical specimens except one showed a good margin of resection tumour free.

Twelve (66.7%), 4 (22.2%) and 2 (11.1%) of the specimens were well, moderately and poorly differentiated squamous cell carcinoma respectively. The various TNM staging of the tumour at indirect/direct laryngoscopy and surgical specimens showed that majority had stage 3 and 4 disease (see Table 1). None of the patients had preoperative CT scan of the larynx to identify cartilage destruction for correlation with the surgical specimen.

Table 1: TNM staging at indirect, direct laryngoscopy and surgical specimen of the patients

Stage	Indirect laryngoscopy	Direct laryngoscopy	Surgical specimen
1	1 (5.6)	-	1 (5.6)
2	1 (5.6)	1 (5.6)	1 (5.6)
3	8 (44.4)	10 (55.6)	10 (55.6)
4	2 (11.1)	3 (16.6)	5 (27.8)
Not recorded	6 (33.3)	4 (22.2)	1 (5.6)

Post-operatively, twelve patients (66.7%) had only radical radiotherapy; four (22.2%) had both radio-chemotherapy while two who had initial preoperative radiotherapy for stage II disease had additional postoperative radiotherapy also. Three out of the seven patients with stomal recurrence had both radio- and chemotherapy while one had only radiotherapy and the remaining three could not be offered any treatment due to rapid deterioration in their clinical state. Ten patients (55.6%) died, (seven with and three without stomal recurrence but who died of distant metastases to the lungs and thoracolumbar vertebral bodies). Two patients with stomal recurrence actually died of erosion into major vessels of the neck. The mean duration from onset of symptoms till death for those with stomal recurrence was 28.29 ± 26.87 months and a range of 6 – 84 months. Only four patients (22.2%) without recurrence are still alive as at the time of this report, the remaining four patients were lost to follow-up and their clinical outcome could not be ascertained.

Discussion

Stomal recurrence still remains a very dreadful complication after radical laryngeal surgery for advanced laryngeal carcinoma especially in the elderly between the fifth and seventh decade as observed in our study. The incidence of this complication is known to range from 5% to 15% in the literature [7]. In the analysis of 4,281 patients in twenty published studies with stomal recurrence, Estenben and co-workers [8] found an overall incidence of 6%. In our study, 38% (7 patients) had stomal recurrence. This is higher than those quoted in the literature, which partly may be due to the small sample size of our study and for the fact that most of our patients presented very late in stage III and IV by which time spread to all the subsites of the larynx (transglottic) would have been established as was observed in fifteen surgical specimens in this study.

The high mortality associated with stomal recurrence was also evident in that all the seven patients with this com-

plication died (100%). However, this may not be an absolute cause of death since there are possibilities of co-morbid locoregional and distant spread which could also be responsible for the high mortality. Most death occurred shortly after the diagnosis of recurrence, considering the mean survival period of 28.89 months from the time of onset of symptoms. This is thus in agreement with a previous work [9]. It took an average of 7.79 months to develop the recurrence post surgery, although lower than the 16 months in the study by Amatsu and co-workers [10]. This also confirms the dismal nature of this complication.

Many authors have tried to determine the possible risk factors involved and the pathogenesis of this complication, yet none has been fully established because for each study that tries to deduce a theory another will be published to counteract such claims. Weisman and co-workers [11] deduced that stomal recurrence might have no single factor or group of factors to explain its occurrence; therefore, it may arise from heterogeneous causes. The major acceptable mechanisms presently are tumour implantation in the tracheostomy wound and persistent pretracheal/pretracheal lymph node metastasis [4,10,12].

Sato and co-workers [16] observed these mechanisms to be related to the cricoid area (subglottic) of the larynx in view of its rich vascular supply, loose areolar area, which is mainly, composed of adipose tissues and loose elastic/collagenous fibres, which invariably are involved in the growth pattern of laryngeal cancer. This is also in conformity with the postulation deduced by Rockley and co-workers [4]. Therefore, many risk factors involved in the development of stomal recurrence have been documented in the literature, but the major ones that have been well researched into are site of primary tumour, tumour staging, and preoperative tracheostomy [3,5,8,9,13-15].

This present study also showed that advanced stages 3 and 4 tumour, involvement of all the subsites of the larynx (transglottic) and the presence of preoperative tracheostomy are the likely risk factors that could be associated with recurrence in our environment. It is to be noted that all the patients at the time of presentation had obstructive laryngeal airway that necessitated preoperative tracheostomy, which has also been noted in the literature [3,9]. Although the timing between preoperative tracheostomy (either as an emergency or elective procedure) and the total laryngectomy was not significantly associated as a risk factor with stomal recurrence in this series, the fact still remains that the postulation earlier described above could account for the high rate of stomal recurrence [4,9].

In view of the dismal outcome of this complication, many authors have advocated various preventive measures to minimize the poor prognosis. One of these includes an emergency laryngectomy within twenty-four hours of presentation with malignant obstruction of the upper airway in order to relieve the obstruction [16,17]. However, this may not be feasible because of the peculiarities of our people who most of the time reject losing their voice at the initial stage of informing them of the type of pathology and its outcome and the best option being surgery to extirpate disease and relieve the

airway. The risk of stomal recurrence is not significantly reduced as noted by Rubin and co-workers [9] when compared with those that had preoperative tracheostomy.

Also, another preventive measure is the use of combined postoperative radiotherapy and chemotherapy [12,18-20]. The use of radiotherapy or chemotherapy preoperatively as short course to reduce the incidence of stomal recurrence may not confer the reduction rate of the complication because the short course may prevent the administration of full therapy postoperatively thereby leading to high recurrence rate. Twelve patients in our review had full course of radiotherapy and only four had the combination therapy, yet seven patients developed the complication thereafter without any beneficial effects. There is therefore the need to plan an elective course of moderate to high dose of radiation pre- or post laryngectomy to involve the stomal and surrounding areas of the neck and chest in high-risk patients in order to sterilize these regions [20-22].

Surgery as a salvage therapy still remains the treatment of choice. However, each patient should be assessed based on Sisson classification in order to determine the prognosis, which has fairly good 5-year survival for types 1 and 2 (45%) and very poor 5-year survival for types 3 and 4 (9%) as noted by Gluckman and co-workers [21]. It should also include the dissection of paratracheal, pretracheal and retrosternal lymph node at the time of laryngectomy [4,8,11]. Other preventive measures suggested by Amatsu [9] should also be taken into consideration at the time of primary surgery and these include thorough irrigation of wounds following total laryngectomy, complete excision of previous tracheostomy tract for preoperatively tracheostomized patients.

Stomal recurrence post laryngectomy has a grave prognosis. There is therefore the need to reevaluate these preventive measures in a prospective study in order to improve the final outcome in our environment.

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