Surgical stoma recurrence after total laringectomy

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Summary

S	oma recurrence after total laryngectomy is one of the most severe developments of squamous cell carcinoma of the larynx. Risk factors most strongly implicated in stoma recurrence have been subglottic invasion by the laryngeal tumor and tracheotomy prior to laryngectomy. Aim: Study the clinical findings of patients who underwent total laryngectomy and evaluate the probable risk factors to the development of stoma recurrence. Study design: Descriptive and retrospective study. Materials and methods: We studied data from 47 patients who underwent total laryngectomy for the treatment of laryngeal cancer between 1995 and 2004 and evaluated recurrences and risk factors. Results: Stoma recurrence developed in 10.6 per cent of them (5 cases). There was no significant correlation between stoma recurrence and subglottic invasion or prior tracheotomy. Conclusion: Stoma recurrence still is one of the most lethal developments associated to laryngeal cancer. In the present study it was not possible to identify factors related to this recurrence. Further studies with a larger sample and a longer follow-up period are necessary to better understand this condition.

Keywords: stoma recurrence.

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INTRODUCTION

Tumor recurrence in the ultimate stomal area after total laryngectomy is one of the most severe developments of the larynx epidermoid carcinoma treated surgically. Recurrences in the tracheostoma area started to be better studied after the study by Keim et al. in 1965. These authors defined it as diffuse neoplastic infiltrations in the area where the trachea stump joins the skin.

According to numerous studies, recurrence incidence in the tracheostoma area after total laryngectomy varies from 1.7% to 25% of laryngectomized patients. Nonetheless, there is great difficulty in knowing the real value of such recurrence rates, since many papers include them in the local recurrence group.

Another significant factor that may cause difficulties in analyzing recurrence incidence in the tracheostoma area is the number of synonyms used to describe such pathology, such as: tracheal metastasis, peritracheal recurrence, tracheal recurrence, paratracheostomal tumor, tracheostomal metastasis, second primary tumor in the trachea.

Most relapses in the tracheostoma area are diagnosed in the first year after total laryngectomy and its pathogenesis is still not clearly defined. Tumor site and disease staging, infraglottic invasion, previous tracheostomy, insufficient surgical margins after total laryngectomy, thyroid invasion by the laryngeal tumor, tumoral implants during surgery and paratracheal lymph node metastasis are the most mentioned correlated factors in the literature. There is no unanimous opinion as to the importance of these factors in tumor recurrence in the tracheostoma area.

The different treatment modalities for these recurrences, that include surgery, radio and chemotherapy, have not been satisfactorily to control the disease, and therefore, a special attention has been given to the prevention of such pathology. Many methods have been proposed to prevent recurrence in the tracheostoma area, such as: lower trachea section allowing for a broader surgical margin, dissection of lymph nodes located in the paratracheal chains, emergency laryngectomies in patients that required tracheostomy prior to their laryngectomy, postoperative radiotherapy including the tracheostoma and the upper mediastinum.

Histopathologic diagnosis was carried out by means of biopsies that were, most of them, done under direct laryngoscopy and general anesthesia. In cases of dyspneic patients at the time of clinical diagnosis, they were submitted to emergency tracheostomy under sedation and local anesthesia in the operating theater and, later on, direct laryngoscopy under general anesthesia.

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In order to carry out the statistical analysis among the different qualitative variables from the 47 patients who underwent total laryngectomy we used the Chi-Squared test or the Fisher Exact test, when necessary, aiming at identifying possible relations among variable classes and the groups of patients that either presented or did not present lapses in the area of the tracheostoma. We used the Mann-Whitney non-parametric test in order to compare ages among the groups of patients with and without recurrence in the tracheostoma area.

The tests were carried out considering a 5% significance level.

The variables analyzed were the following: age, gender, clinical staging (TNM), tumor location, previous/postoperative tracheostomy, postoperative radiotherapy.

RESULTS

Recurrences in the tracheostoma area occurred in 5 cases (10.6%) of 47 patients who underwent total laryngectomy.
There was no statistically significant difference among ages (p=0.449) and gender (p<0.999) of the patients who had recurrences in the tracheostoma area when compared to those who did not have such recurrence.

Among the 47 laryngectomized patients, according to the TNM-UICC classification, 14 (29.78%) patients were staged as T2; 23 patients (48.9%) as T3 and 10 (21.27%) patients were T4 (Table 1).

Of the patients who had recurrences in the tracheostoma area, 2 (40%) had been staged as T2, 2 (20%) patients as T3; and 1 (20%) as T4. There was no statistical significance between tumor size (T) and recurrence in the tracheostoma area (p=0.864) (Table 1).

Analyzing the 47 patients with larynx epidermoid carcinoma who underwent total laryngectomy, 26 (55.31%) did not have palpable neck lymphnode at the time of disease diagnosis, while 21 (44.68%) had clinically palpable lymphnodes and with metastatic characteristic at the time of disease clinical diagnosis (Table 1). There was no statistically significant correlation between neck lymphnode metastasis and tumor recurrence at the tracheostoma area (p=0.240).

The division by compromised structure showed that of the 5 patients with recurrence at the tracheostoma area, 2 (40%) had initial lesion in the glottis only, 2 (40%) had lesion in the glottis/subglottis; and 1 (20%) had lesion in the supraglottis/glottis (Table 2).

In our series there was no statistical association between recurrence in the tracheostoma area and the primary tumor affecting the subglottis (p=0.054).

We observed that of the 47 patients who underwent total laryngectomy, 17 (36.17%) had been submitted to tracheostomy prior to the definitive surgery, probably due to dyspnea or tumor size seen at the time of diagnosis. Among the 5 cases of recurrences at the tracheostoma area, 3 (60%) had had previous tracheostomy (Table 2). Even then there was no statistic significance between this variable and recurrences (Table 1).

Postoperative radiotherapy was used in 4 (80%) patients that later on evolved with recurrences at the tracheostoma site. In these patients, radiotherapy was employed because of histologically metastatic lymphnodes in the neck.

We did not observe statistically significant differen-

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**Table 1. Recurrence in the tracheostoma area according to clinical characteristics.**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th># of patients (%)</th>
<th># of recurrences in the tracheostoma area</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glottis</td>
<td>18 (38.3%)</td>
<td>2</td>
<td>0.289</td>
</tr>
<tr>
<td>glottis/infra-glottis</td>
<td>4 (8.5%)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>supraglottis</td>
<td>3 (6.4%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>supraglottis/glottis</td>
<td>20 (42.6%)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>supraglottis/glottis/infra-glottis</td>
<td>2 (4.3%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Previous tracheostomy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17 (36.2%)</td>
<td>3</td>
<td>0.336</td>
</tr>
<tr>
<td>No</td>
<td>30 (63.8%)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>N (clin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N0</td>
<td>26 (55.3%)</td>
<td>4</td>
<td>0.240</td>
</tr>
<tr>
<td>N1 - N3</td>
<td>21 (44.7%)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>T (clin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>14 (28.8%)</td>
<td>2</td>
<td>0.864</td>
</tr>
<tr>
<td>T3</td>
<td>23 (48.9%)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>10 (21.3%)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Postoperative radiation</td>
<td></td>
<td></td>
<td>&lt;0.999</td>
</tr>
<tr>
<td>Yes</td>
<td>32 (68.1%)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15 (31.9%)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*clin – TNM Clinical staging*
Table 2. Detailed information on the 5 patients with recurrences in the tracheostoma area

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Primary site</th>
<th>Previous tracheostomy</th>
<th>Postoperative radiation</th>
<th>Staging</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71</td>
<td>glottis/subglottis</td>
<td>Yes</td>
<td>Yes</td>
<td>T2N0M0</td>
</tr>
<tr>
<td>2</td>
<td>58</td>
<td>supraglottis/glottis</td>
<td>Yes</td>
<td>Yes</td>
<td>T2N0M0</td>
</tr>
<tr>
<td>3</td>
<td>76</td>
<td>glottis</td>
<td>No</td>
<td>Yes</td>
<td>T3N1M0</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td>glottis/subglottis</td>
<td>Yes</td>
<td>Yes</td>
<td>T4N0M0</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>glottis</td>
<td>No</td>
<td>No</td>
<td>T3N0M0</td>
</tr>
</tbody>
</table>

ces when we analyzed the recurrence in the tracheostoma area in relation to the use of postoperative radiotherapy (p<0.999).

**DISCUSSION**

Recurrence in the tracheostoma area is considered the most severe and fatal complication of laryngeal cancer. In the many series, the recurrence incidence in the tracheostoma area varies between 1.7% and 25%2,3, and in our study we report an incidence of 10.6%.

In 1965, Keim et al.1 revised 116 cases of patients who underwent total laryngectomy because of larynx epidermoid cancer. Recurrences in the tracheostoma area happened to 70 patients, all of them died. It was then defined that the concept of recurrence in the tracheostoma area would be a diffuse neoplastic infiltration, at the junction between the trachea stump and the skin. Based on such criteria, the lesion could compromise the stomal epithelium, adjacent tissue or both.

The true rates are unknown because many series reported in the literature classify the recurrence in the tracheostoma area as part of local recurrences5.

Another problem found is the large number of synonyms used to define this type of pathology, such as: tracheal metastasis, peritracheal recurrence, tracheal recurrence, paratracheostomal tumor persistence, tracheostomal metastasis, and second primary tumor in the trachea5.

Most of these recurrences are diagnosed in the first year after total laryngectomy12. Kowalski16 reported an average of 5.5 months for recurrence to appear. In his study, 19 of 24 patients (79.2%) had recurrence after 1 year of follow up. Contrasting that, Modlin and Ogura11 reported a longer period for the recurrence diagnosis, varying from one to two years after laryngectomy.

The tumor primary site is a significant risk factor for recurrence in the tracheostoma area. In larynx cancer, infraglottic involvement remains as the major risk factor for recurrences in the tracheostoma area1,6,14,18. Many authors believe that these tumors have a tendency towards fast paratracheal tissue involvement, because of its submucosal expansion. There also is a natural trend for infraglottic tumors to infiltrate the larynx framework and consequen-

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rway obstruction also extend towards the subglottis. Prior tracheostomy in these patients, necessary to establish a new airway has been identified as an important risk factor for recurrences in the tracheostoma area.\(^1\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}19\) This is due to the fact that prior tracheostomy may allow the implantation of viable neoplastic cells from tumor shedding that have an intense inflammatory process and repair granulation tissue - the bed may be prone to cell adhesion.\(^2\) In the literature such risk is reported as varying between 8 and 41%\(^6\).\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,}\)\(^{,\)
surgical specimen. When there is any suspicion of thyroid involvement, we carry out ipsilateral lobectomy on the lesion site or total thyroidectomy.

Better results of tumor recurrence control at the tracheostoma area were obtained through the association of post-operative radiotherapy.27,30-32

We indicate postoperative radiotherapy in cases where the surgical margins were compromised or very thin, and also in the presence of histologically confirmed lymphnode metastasis. In the present study, among the 5 patients who presented recurrences in the tracheostoma area, 4 (80%) had undergone postoperative radiotherapy, including the tracheostomal field. This may cause doubts as to the possible usefulness of postoperative radiotherapy in preventing recurrences in the tracheostoma area.

The treatment of recurrences in the tracheostoma area is not often curative, and palliative treatment results are frequently unsatisfactory.1,30,33

Since the 60's, recurrent tumor and trachea resections associated to upper mediastinum clearance have been the only efficient therapeutic approaches to recurrences in the tracheostoma area. Many authors describe that the best approach for recurrences in the tracheostoma area is surgery.2,12,28 Nonetheless, surgery must be customized for each patient, assessing clinical conditions in order to decide for such a complex procedure, and also consider the possible radical resection of this recurrence.

Results from radiotherapy alone are not satisfactory to treat recurrences in the tracheostoma area; nonetheless it is indicated as a palliative treatment in inoperable cases, both due to recurrence unresectability in the tracheostoma area, and unfavorable patient clinical condition.4,29,32

Chemotherapy alone, or associated with radiotherapy do not bring about significant responses, either objective or subjective, and not even enhances patient’s life quality for those with extensive and unresectable recurrences.4,10

As we see it, surgery is the treatment of choice, depending on recurrence extension and the patient’s clinical situation. In our 5 cases, treatment employed was radiotherapy due to recurrence staging and the unfavorable clinical conditions of our patients at the time.

CONCLUSION

Recurrence in the tracheostoma area after total laryngectomy still is one of the most severe and almost lethal complications of larynx cancer. In the present investigation, we did not identify factors related to the genesis of such recurrence based on the clinical exam of the laryngectomized patients. We need further studies with more cases, longer follow up periods and complementary data from pathology in order to better understand this pathology and identify possible candidates for this type of recurrence and, thus, provide the best treatment possible for them.

REFERENCES