
PROGNOSIS OF RECURRENT LARYNGEAL CARCINOMA AFTER LARYNGECTOMY

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Background. Recurrence is common after total laryngectomy for advanced laryngeal carcinoma. The aim of the present study was to review the prognosis of recurrent laryngeal carcinoma after total laryngectomy.

Methods. The records of 165 patients who developed recurrences after total laryngectomy for laryngeal squamous cell carcinoma between January 1971 and December 1990 were reviewed.

Results. Of the 165 patients who developed recurrences, 34 (21%) patients had surgical salvage. The sites of recurrence of these 34 operable patients included 11 pharyngeal, 3 tracheostomal, 15 nodal, 2 pharyngeal with nodal, and 3 pulmonary metastasis. Pharyngeal recurrence had the highest salvage rate, followed by nodal and pulmonary recurrence. All patients with tracheostomal had recurrence after salvage surgery. After the surgical salvage, the tumor recurrence rate was 44% and the 5-year actuarial survival rate was 42%. Of the other 131 patients who had palliative treatment without surgical salvage, the 5-year actuarial survival rate was 2%.

Conclusions. The present study showed that patients who had surgical salvage for recurrent tumor after total laryngectomy had satisfactory prognosis. Close follow-up of patients after initial operation is essential to detect recurrence early, while surgical salvage is still feasible.

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The incidence of new cases of laryngeal carcinoma in Hong Kong is 4.5 per 100,000 population per year.¹ In our department, radiotherapy is the primary treatment for stage I and stage II carcinoma because the cure rate is high and the quality of voice after treatment is usually good. Partial laryngectomy is rarely performed for early-stage carcinoma. Total laryngectomy with or without combination of radiotherapy is the primary treatment for stage III and stage IV carcinoma for better locoregional control of tumor. Total laryngectomy is also our treatment of choice for the salvage of radiotherapy failures.^{2,3} However, up to 50% of patients developed recurrences at the pharynx, tracheostome, neck lymph node, or distant sites after total laryngectomy.⁴⁻⁹ We have adopted a radical surgical management strategy for those patients with recurrent head and neck tumors. The aim of the present study was analysis of the efficacy of surgical salvage for recurrent tumor after total laryngectomy for squamous cell carcinoma of the larynx.

PATIENTS AND METHODS

The present study aimed at analysis of the 165 patients with recurrent tumor who had received total laryngectomy for laryngeal squamous cell carcinoma between January 1971 and December 1990 in the Department of Surgery, The University of Hong Kong, Queen Mary Hospital. There were 384 patients who had total laryngectomy for laryngeal carcinoma in this period; they included 241 who underwent laryngectomy for radiother-

apy failures and 143 who underwent laryngectomy as primary treatment, with 74 of them given postoperative adjuvant radiotherapy. Of those 265 N0 neck patients, the watchful waiting policy was adopted, except in 35 patients for whom elective radical neck dissections were performed because the pectoralis major myocutaneous flaps were used in the reconstruction of the pharynx, and another 2 patients who had elective selective II, III, and IV neck dissections. All 119 node-positive patients had classical radical neck dissections.

Recurrent tumors were treated surgically whenever feasible. The feasibility of surgical salvage of recurrent tumors was judged by the surgeons at the time of recurrence and could not be accurately analyzed for the individual patient in the present retrospective study. However, the general principles of operability were adopted in our department. Locoregional recurrences were considered feasible for surgical salvage when the tumor could be clearly resected and reconstructed. Locoregional recurrences were considered not feasible for surgical salvage when they were extensively infiltrative, fixed to the prevertebral muscles or bony structures, or extension to the mediastinum. Distant metastasis was considered inoperable unless the tumor was confined to one lobe of the lung that could be removed by lobectomy with good residual lung function. All locoregional tumors associated with distant metastasis were not considered operable.

Patients whose tumors were considered not feasible for surgical salvage were given palliative treatments. Palliative radiotherapy was considered only for those patients who had no prior radiotherapy. Palliative systemic chemotherapy was considered only if the general conditions were satisfactory and the function of the major organs—including the bone marrow, liver, and kidney—were normal. Medical fitness and patient's choice were important considerations in the planning of management of individual patients.

The life-table method and Wilcoxon (Gehan) statistics (SPSS for windows) were used in the analysis of actuarial survival.

RESULTS

There were 165 patients who developed recurrences after total laryngectomy for laryngeal carcinoma; all were included in the present analysis. Of these 165 patients, 105 patients had been operated initially for salvage of radiotherapy fail-

ure, 34 patients had been treated with combined surgery with postoperative radiotherapy, and 26 patients had been treated with surgery alone. According to UICC (1982) clinical stages, 2 patients were stage II; 43, stage III; and 120, stage IV. Their primary operations were 101 total laryngectomy, 19 laryngopharyngectomy, and 45 pharyngolaryngoesophagectomy (PLO). Of the 109 N0 patients, 90 patients had no elective neck dissections, 18 patients had elective radical neck dissections, and 1 patient had elective selective II, III, IV neck dissection. All of the other 56 N+ patients had classical radical neck dissections. The range of follow-up of these patients was 2–142 months (mean, 33 months).

Of the 165 patients who developed recurrences after the initial operations, 34 (21%) patients underwent surgical salvage for recurrent tumors. All were men and their ages ranged from 33 to 72 years (mean, 59 years). Twenty-three patients had had initial surgical treatment for radiotherapy failures, 8 patients had received combined surgery with postoperative radiotherapy as the initial treatment, and 3 patients had prior surgical treatment alone for laryngeal carcinoma. The mean time of detection of recurrence from the date of laryngectomy was 12 months (SD, 11 months).

Of the other 131 (79%) patients who were given palliative treatment without surgical salvage, there were 121 men and 10 women with an age range of 34 to 81 years (mean, 61 years). The mean time of detection of recurrence from the date of initial operation was 11 months (SD, 12 months). Of these 131 patients, 112 had prior radiotherapy. Four patients who had no prior radiotherapy were given palliative radiotherapy treatment for locoregional recurrence. Fifty patients were given palliative systemic chemotherapy, mainly consisting of 5-FU, cisplatin, or methotrexate for the recurrent tumor.

The pattern of recurrence after laryngectomy and the results of surgical salvage are shown in Table 1. Of the 11 salvage surgeries for pharyngeal recurrences, 10 patients had prior total laryngectomy and 1 patient had prior PLO. Of those 10 patients with prior total laryngectomy, 3 were salvaged with pharyngectomy, 1 with pharyngectomy with elective radical neck dissection (RND), and 6 with PLO. The other patient with prior PLO was treated with pharyngectomy and elective RND. Three tracheostomal recurrences were treated with tracheal resection and mediastinal dissections. Of the 38 nodal recurrences without

Table 1. Pattern of recurrence and results of surgical salvage.

Site of first recurrence	Recurrence, <i>n</i>	Surgical salvage, <i>n</i> (%)	Results of surgical salvage (<i>n</i>)
Pharynx	22	11 (50)	Surgical mortality (2) Nodal recurrence (1) Locoregional recurrence (1) Distant metastasis (1)
Tracheostome	11	3 (27)	Tracheostomal recurrence (2) Distant metastasis (1)
LN without prior RND	38	15 (39)	Ipsilateral nodal recurrence (6) Contralateral nodal recurrence (1) Nodal and distant recurrence (1) Distant metastasis (1)
LN with prior RND	7	0 (0)	—
Pharynx and LN	14	2 (14)	No recurrence
Tracheostome and LN	3	0 (0)	—
Distant	55	3 (5)	Lung recurrence (1)
Locoregional and distant	15	0 (0)	—
Total	165	34 (21)	Surgical mortality (2) Recurrence (16)

LN, neck lymph node; RND, radical neck dissection.

prior RND, 31 patients had prior radiotherapy to the neck and the other 7 patients had no prior radiotherapy. Of the 15 salvage RND for nodal recurrence alone, 13 patients had prior radiotherapy and 2 patients had no prior radiotherapy. Of the 2 patients who had surgical salvage for both pharyngeal and nodal recurrences, 1 patient was salvaged with pharyngectomy with RND and the other 1 was salvaged with PLO and RND. Three patients with solitary lung metastasis confined to one lobe underwent pulmonary lobectomy; their pathologic diagnoses were consistent with metastatic lesions from the laryngeal carcinoma. All patients with nodal recurrence after prior neck dissection, tracheostomal with nodal recurrence, and locoregional with distant metastasis were considered to have disease not feasible for surgical salvage. Of all 165 patients with recurrent tumors, only 34 (21%) patients underwent surgical salvage.

Of all 34 surgical salvage operations, 16 patients developed recurrent tumor. Among these 16 patients who failed the surgical salvage, 2 patients underwent a second salvage operation. These 2 patients again developed recurrences on the same side of neck after the salvage radical neck dissections for nodal recurrence. One patient underwent radical excision of the recurrent tumor together with the overlying skin, but the patient again developed recurrence. The other patient underwent tumor excision together with the overlying skin and partial pharyngectomy, and the patient remained alive free of tumor.

Of all 34 patients who had surgical salvage, 2 (6%) patients died of surgical complications, 15 (44%) patients died of tumor recurrence, 4 (12%) patients died of unrelated causes, and 13 (38%) patients were alive without tumor at the last follow-up.

Of the other 131 patients who were given palliative treatment, 129 patients died of tumor, and only 2 patients who were given chemotherapy for distant metastasis survived for more than 2 years.

The actuarial survival rates of the two groups of patients are shown in Figure 1. The 5-year actuarial survival rate of the patients with surgical salvage treatment was 42% and the palliative treatment was 2%. The median survival of the

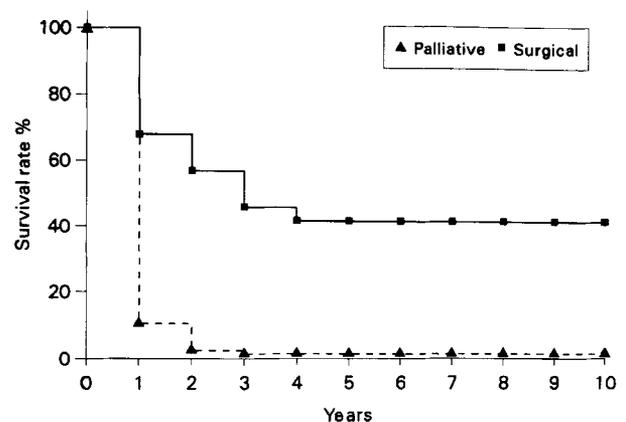


FIGURE 1. Actuarial survival of patients with recurrent laryngeal carcinoma.

patients with surgical treatment was 32 months and the palliative treatment was 7 months. Patients who underwent surgical salvage treatment had significantly longer survival compared with palliative treatment (Wilcoxon, $p < .001$).

DISCUSSION

The present study shows that surgical salvage for recurrent laryngeal carcinoma after previous total laryngectomy has acceptable results. Surgical treatment has satisfactory control of the tumor, with a 44% actuarial recurrence rate and a 42% 5-year tumor-free actuarial survival rate. For those patients whose disease was considered not feasible for surgical salvage, radiotherapy and chemotherapy were not effective treatments. Unfortunately, only 21% patients could be treated with surgical salvage upon recurrence. Most patients were not considered for surgical salvage because the recurrent tumors were too advanced for curative resection by the time they were detected.

Pharyngeal recurrence alone had the highest operable rate (50%) and lowest failure rate after surgical salvage because symptoms of dysphagia tended to occur early. Nowadays, we perform flexible endoscopy when there are symptoms suspicious of local recurrence. It is important to perform endoscopy early whenever a patient begins to feel discomfort on taking food. A biopsy should always be obtained, even for a benign-looking stricture, and it should be repeated before any pharyngeal dilatation is done. Circumferential pharyngectomy alone is usually adequate for local recurrence, and pharyngoesophagectomy is necessary when the tumor has extended to the lower cervical esophagus. Before the advent of pectoralis major myocutaneous flap (PMF), we converted the pharyngectomy into pharyngoesophagectomy to bring up the stomach for pharyngogastric anastomosis.¹⁰ When PMF became available, we used tubed PMF for bridging the pharyngeal defect.^{11,12} The use of tubed PMF reduced the operative mortality and chest complications by avoiding the abdominal and mediastinal dissection, but it had disadvantages of high incidence of leakage and stricture. In recent years, we have used the free jejunum for pharyngeal reconstruction.¹³ The free jejunum is recommended because it is reliable and has low incidence of leakage and stricture. Of the 11 patients who underwent surgical salvage for pharyngeal recurrences, only 2 developed recurrences at the neck after surgery. The results show that in selected patients with operable local recurrence, the

prognosis after surgical salvage is good. The association of nodal recurrence with pharyngeal recurrence, however, indicated more advanced disease and only 2 (13%) patients' disease was considered operable.

Nodal recurrence is more difficult to detect early by clinical palpation because the neck skin becomes thickened due to the prior surgery and radiotherapy to the neck. Only 39% of nodal recurrences of previous clinical N0 neck were feasible for surgical salvage. The prognosis of surgical treatment for nodal recurrence was less satisfactory compared with the pharyngeal recurrence, and 53% of patients developed neck recurrence after radical neck dissection. Of the 7 patients who developed regional recurrences after salvage RND, only 1 patient could be salvaged with a second radical resection including lymph node, the involved skin, and pharynx, but the other 6 patients died of recurrences in the neck. In view of the high nodal recurrence rate after RND, postoperative radiotherapy is recommended for those patients who have no prior radiotherapy treatment to the neck.

Tracheostomal recurrences alone were uncommon (3%), and they all had lethal outcome. Only 3 (27%) patients' disease was considered feasible for surgical salvage, and none could be cured. Despite radical surgical treatment, the prognosis of tracheostomal recurrence remained poor. Tracheostomal recurrence is more common in patients with subglottic laryngeal carcinoma.¹⁴ In view of the poor prognosis of tracheostomal recurrence, it has been recommended that paratracheal lymph node dissection together with total thyroidectomy be done in the presence of subglottic tumor involvement to reduce tracheostomal recurrence.¹⁵⁻¹⁷

In the present study cases of solitary pulmonary metastasis were the only distant metastases that could be treated surgically. Of the 3 patients who underwent pulmonary lobectomy, 1 patient again developed pulmonary recurrence. Although it is difficult to assess the extent of micrometastasis with the available technology, it is however worth resecting a solitary pulmonary metastasis, and cure is often possible.^{18,19}

In conclusion, patients with early recurrences had satisfactory prognosis after surgical salvage. Unfortunately, only 21% of patients could undergo surgical salvage upon recurrence. It is no doubt important to prevent recurrence in the treatment of laryngeal carcinoma, but it is also essential that patients should be closely followed-

up to detect recurrences early so that they can still undergo surgical salvage.

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