ISOLATED NECK RECURRENTENCE AFTER DEFINITIVE RADIOTHERAPY FOR NODE-POSITIVE HEAD AND NECK CANCER: SALVAGE IN THE DISSECTED OR UNDISSECTED NECK

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Abstract: Background. The role of salvage neck dissection for isolated regional recurrences after definitive radiotherapy (RT) is ill-defined.

Methods. Five-hundred fifty patients were treated with RT for lymph node–positive head and neck cancer. RT consisted of a median dose of 74.4 Gy. Chemotherapy was administered in 133 patients (24%). Patients were followed for neck failure after planned neck dissection (n = 341) or observation (n = 209). Salvage therapy was offered to those with isolated neck recurrences.

Results. There were 54 (10%) failures in the neck at a median 3.7 months after RT (range, 0 to 17 months). Thirteen patients had isolated recurrences after receiving definitive RT with (n = 11) or without (n = 2) neck dissection. Nine patients underwent attempted surgical salvage with or without re-irradiation and 4 were successfully salvaged without major complications.

Conclusions. Patients with neck failure after definitive therapy usually have poor outcomes, but salvage attempts may be successful in selected patients with an isolated neck recurrence.

Keywords: head and neck cancer; radiotherapy; neck dissection; salvage

Neck dissection is often an important component of therapy for patients with head and neck cancer. Because of recent improvements in outcomes with definitive radiation therapy (RT), including concurrent chemotherapy and accelerated fractionation, surgical management of the neck has evolved. The traditionally accepted role of planned neck dissection for bulky disease after RT has been challenged by several groups based on the low risk of residual disease or neck recurrence after complete response by physical exam,2–4 CT,5 and positron emission tomography.6 However, one major concern with observation of the neck is the potential inability to successfully salvage neck recurrence. The purpose of this study is to review the incidence of neck failure after definitive RT for head and neck cancer, and evaluate our experience with salvage dissection after isolated recurrence in the neck.

MATERIALS AND METHODS

The records of 550 consecutive patients with lymph node–positive head and neck cancer
Patients included in this review underwent RT with curative intent for squamous cell carcinoma of the head and neck and had no prior neck dissection or history of RT. Patient characteristics are listed in Table 1. RT usually consisted of a parallel-opposed lateral technique, with a median dose of 74.4 Gy (range, 55.0 to 81.75 Gy) predominantly given at 1.2 Gy/fraction (77%) twice daily. Total treatment time for all patients was a median 46 days (range, 26 to 77 days). Chemotherapy was administered in 133 patients (24%), and was usually cisplatin-based.

Three hundred forty-one patients (62%) underwent post-RT planned neck dissection, usually a modified radical neck dissection including levels I–V, at a median 47 days after completion of RT (range 23 to 175 days). Two hundred eighty-six patients had unilateral neck dissection and 55 patients had bilateral neck dissection. Pathologic results of the post-RT neck dissection were available in 325 patients. After an initial review of the data indicated a high likelihood of negative neck dissection for patients with a complete response on posttreatment CT,5 patients did not routinely undergo neck dissection. Forty-eight patients did not receive or had an incomplete planned post-RT neck dissection because of unresectable neck disease (n = 19), medical contraindications (n = 11), development of distant metastases (n = 8), refusal (n = 5), uncontrolled primary disease (n = 3), intercurrent death (n = 1), or unresectable neck disease with distant metastases (n = 1). These patients are separated from other patients for analysis of neck recurrence (Table 2) because they did not receive all planned therapy (RT followed by neck dissection if necessary), and therefore had a significantly elevated risk of neck failure. Neck failure was defined as any clinical or radiographic evidence of disease recurrence in the retropharyngeal nodes, or neck levels I–VI.

Return follow-up appointments occurred on a 4- to 6-weeks basis for the first year, and were gradually extended to yearly after 5 years. At each follow-up, a complete history and physical exam were performed, and flexible, endoscopic laryngos-
copy and CT of the neck were performed if indicated. Surveillance CT scans were not regularly performed (including patients with observed necks), but CT was ordered with suspicion of disease recurrence such that all patients with neck recurrence did have documented radiographic disease. Patients with isolated neck recurrences after RT were potential candidates for a salvage procedure if there was no involvement of the carotid arteries on CT. Success of neck salvage was defined as a period of 2 years or greater, with no radiographic disease using 1 or more salvage therapies. This time point was chosen because it exceeded the time of latest neck failure after initial definitive RT (16.8 months). Patients unavailable for clinical follow-up were contacted by phone. Median observed follow-up was 3.3 years from the start of RT (range, 0.1 to 14.7 years); 23 patients (4%) were lost to follow-up and censored at time of last follow-up, at a median 5.0 years (range, 0.5 to 9.4 years) after completion of RT. Follow-up on living patients ranged from 0.5 to 14.7 years (median, 5.2 years).

All data were analyzed using NCSS/PASS 2000 and SAS software. Estimates of freedom from selected time-dependent endpoints were calculated using the Kaplan–Meier product-limit method. Endpoints after salvage therapy are timed from the date of initial isolated neck recurrence.

**RESULTS**

Table 2 includes the rates of neck control and isolated neck recurrence for patients who were recommended to have planned post-RT neck dissection (separating those who were not able to have neck dissection), and patients who did not undergo planned post-RT neck dissection based on clinical or radiographic response.

There were 54 patients (of 550, 10%) who failed in the neck at a median 3.8 months after RT (range, 0–16.8 months). Twenty-six of these neck failures were related to inability to undergo planned, post-RT neck dissection (Table 2).

Not including those patients who were ineligible for planned, post-RT neck dissection, there were 28 neck failures that occurred at a median 8.2 months (range, 2.7 to 16.8 months) from the end of RT. Twenty failures occurred after planned post-RT neck dissection, while 8 failures occurred in the undissected neck (Table 2). Thirteen patients had isolated neck failure without any evidence of local or distant recurrence and were candidates for salvage neck dissection (Table 2). Neck recurrences were ipsilateral in all of these patients, at an initially involved site of neck disease \( (n = 11) \) or an uninvolved site of the neck \( (n = 2) \), with recurrence in either level 5 or 6 of the neck. For patients with isolated neck recurrence, the head and neck primary site of disease was oropharynx \( (n = 9) \) or hypopharynx \( (n = 4) \), and a few patients were treated with concurrent \( (n = 2) \) or neoadjuvant \( (n = 1) \) chemotherapy.

Of these 13 patients, 9 underwent attempted surgical salvage, and 4 were offered palliative chemotherapy based on a low probability of complete resection. Overall, 4 patients were salvaged, with disease-free follow-up ranging from 2.1 to 10.5 years. Neck control and survival are demonstrated in Figure 1.

Surgical salvage consisted of selective neck dissection or wide local excision \( (n = 5) \), neck dissection of levels I–V \( (n = 3) \), or extended neck dissection \( (n = 1) \). Of 9 patients who underwent attempted surgical salvage, 3 patients were unable to have a complete resection and died with persistent neck disease at 1, 3, and 11 months later. Six patients did have a complete resection; 1 patient is controlled with 7 years of follow-up after initial surgical salvage, while the other 5 patients experienced another isolated neck failure at median 5 months (range, 3 to 26 months). Of 5 patients with second neck recurrence, 2 were not candidates for further salvage and died with persistent neck disease at 2 and 3 months after neck failure, while 3 underwent further salvage therapy. Two of these patients had a wide local excision of limited disease recurrence followed by RT. One patient received 50 Gy delivered by an in-
dine-125 single plane implant and is alive and controlled with 8 years follow-up, while the other received 69.6 Gy external beam RT and died of intercurrent disease (metachronous head and neck cancer) 15 months later with controlled neck disease. A third patient had a radiographic recurrence in a retropharyngeal node after initial surgical salvage and was treated with a radiosurgery dose of 15 Gy prescribed to the 80% isodose line; he died of intercurrent disease 8 years later.

Three of 4 patients who were offered chemotherapy accepted. None had a significant clinical response, although 1 had stable disease with 1 year of treatment (with several cycles of Taxol 75 mg/m²), and time of death was 3, 33, and 80 weeks after initiation of chemotherapy.

Wound breakdown or delayed wound healing lasting more than 1 month was seen in 3 of 9 patients who underwent attempted surgical salvage. In the 3 patients successfully salvaged with a surgical procedure, only 1 had wound breakdown, which healed with conservative measures 8 months afterwards. There were no fistulas or carotid blowouts.

**DISCUSSION**

After definitive RT with or without neck dissection for lymph node–positive head and neck cancer, the neck failure rate was 10% (n = 54) for all patients in this study. Roughly half of the neck failures that occurred after completion of all planned therapy (n = 28) were isolated failures (n = 13). Approximately two thirds (n = 9) of the isolated neck failures were candidates for surgical salvage, and half (n = 4) were ultimately salvaged with 1 or more procedures, with no life-threatening complications.

While the total number of patients with salvageable neck recurrence remains very low, the prognosis of patients with isolated neck recurrence is not always dismal if salvage is attempted. These results may be a slight improvement from earlier reports which contend that the success of salvage neck dissection for isolated recurrence is remote. Bernier et al evaluated 1646 patients with head and neck cancer treated with RT at Institut Curie and found 116 patients with isolated neck recurrence, only 1 of whom was salvaged.9 Temam et al10 evaluated 136 patients treated with accelerated fractionation at Institut Gustave-Roussy, and found 8 patients with isolated neck recurrence that underwent salvage neck dissection, only 1 of whom was salvaged but at the expense of major wound complications, probably related to the aggressive fractionation scheme of the radiotherapy. Our previous review at the University of Florida evaluated 356 patients treated between 1964 and 1995 with RT, and found 11 patients with isolated neck recurrence, only 1 of whom was salvaged.11

Given the retrospective nature of this study, and the relatively small number of patients who underwent salvage therapy for limited recurrence, it is difficult to draw conclusions regarding the optimal management of isolated neck recurrence. Unfortunately, it is not possible to comment on the importance of various components of treatment (eg, concurrent chemotherapy, post-RT neck dissection, and re-irradiation after excision of recurrence). The slight improvement in success of salvage neck dissection in this study could be related to more aggressive definitive therapy in the modern era and better use of imaging to manage the post-RT neck and detect recurrence at an early stage. Since 1990, we have been using CT routinely to stage the neck prior to treatment and assess response in the neck after RT. CT is more sensitive than physical exam at detecting small amounts of residual disease, and its use after definitive RT could help minimize the overall risk of neck recurrence by selecting patients who may or may not benefit from a post-RT neck dissection.5,12 In the subset of patients who do not have post-RT neck dissection, it is unclear whether surveillance CT scans could improve the chances of early detection of limited recurrence. The lone patient in this study who was salvaged with neck dissection without further recurrence had limited disease detectable only by CT; as a result, we feel that it is reasonable to recommend surveillance CT scans every 3 to 4 months for up to 2 years in patients who do not undergo neck dissection based on complete response by post-RT CT.

In conclusion, the rate of neck control after definitive RT with or without post-RT neck dissection for head and neck cancer is high (90%), and isolated neck recurrences are relatively uncommon. Although patients with isolated neck recurrences generally fare poorly, salvage therapy can be successful in select cases. The decision to proceed with salvage therapy should be individualized and balanced against the perceived risk of complications.

**REFERENCES**


