The management of the N0 neck in head and neck cancer has been a cause of controversy for several decades.\(^1\)\(^-\)\(^10\) The main indications for elective neck dissection in these patients are as follows: (1) high incidence of neck recurrence in the follow-up, when the “wait and see” policy has been followed; (2) high incidence of occult metastasis found in the pathological evaluation of the surgical specimen when neck dissection is performed;\(^1\)\(^-\)\(^2\)\(^,\)\(^6\)\(^,\)\(^10\) and (3) neck recurrences for which salvage treatment is not feasible.\(^5\)\(^,\)\(^11\) Some predictive factors for nodal metastasis are well established and can serve as indications of selective neck dissections; however, tumor thickness, the most important of these factors, and others (perineural infiltration and vascular embolization), are only available after the postoperative pathological report.\(^12\) Diagnostic procedures such as computed tomographic scan or neck ultrasonography and needle aspiration biopsy can increase the reliability of pretreatment staging, but also present significant rates of false-positive and false-negative results.\(^13\)

Supraomohyoid (SOH) neck dissection is the standard staging procedure and may even be considered therapeutic for patients with N0 oral and oropharyngeal cancer.\(^6\) However, the reported rates and sites of neck recurrences vary considerably.\(^1\)\(^-\)\(^2\)\(^,\)\(^6\)\(^,\)\(^7\)\(^,\)\(^10\) The main objective of this study is to analyze the incidence and the level (site) of ipsilateral neck recurrences after SOH dissection in patients with lip, oral, and oropharyngeal cancer with N0 necks treated with SOH neck dissection in a single institution.

The median number of dissected lymph nodes was 25 (range, 3-57). Thirty-seven patients (24.0%) had metastatic lymph nodes in the specimen. The number of metastatic lymph nodes per patient varied from 1 to 5. Twenty-seven patients (73%) had a single positive node. The information about...
PATIENTS AND METHODS

From 1979 to 1997, 154 patients with N0 necks underwent ipsilateral elective SOH dissection. This series excluded all the patients who had the planned SOH dissection converted to a radical neck dissection owing to the finding of 1 or more metastatic lymph nodes confirmed by frozen section. Unfortunately, our files register only the final surgical procedure, and thus the exact number of patients in this particular situation cannot be established.

The patients included in this study were 123 men (80.0%) and 131 whites (85.1%). Ages ranged from 26 to 87 years (median age, 61 years). Tumor sites were the lip, 5 cases (3.3%); oral cavity, 128 cases (83.1%); and oropharynx, 21 cases (13.6%). Tumor stages were T1, 13 cases (8.4%); T2, 77 cases (50.0%); T3, 40 cases (27.0%); and T4, 22 cases (14.3%). In 2 cases (1.3%) the T stage was not recorded. Sixty-eight patients (44.2%) underwent postoperative radiotherapy. Megavoltage external radiation therapy was started 4 to 12 weeks (median, 3 weeks) after the surgery, and was directed to both sides of the neck as well as to the primary tumor site. Doses to the upper part of the neck ranged from 30 to 78 Gy (median dose, 59 Gy). In the lower part of the neck, doses ranged from 45 to 55 Gy. The dose to the spinal cord was kept below 42 Gy.

The incidence of neck recurrences was evaluated according to the pathological findings and whether the patient underwent postoperative radiotherapy. Also, the site of recurrence was noted, whether it was within or beyond the limits of SOH neck dissection.

The surgical procedure (SOH neck dissection) was performed according to the technique described by Spiro et al.10 In summary, this includes the removal of the lymphatic contents of the submental and submandibular triangles (level I) and upper and middle jugular lymph nodes (levels II and III), including the suprathyroid accessory lymph node pad. The inferior limit is the omohyoid muscle, and the posterior limit is the posterior border of the sternocleidomastoid muscle and the anterior surface of the cervical sensory roots arising from the cervical plexus (Figure 1, left). Preliminary results of a study published in 19981 showed that 4% of the patients who underwent an elective modified radical neck dissection had positive nodes at level IV. Based on the preliminary results of this study evaluated in 1994, we began a prospective study, performing extended SOH dissections, including level IV lymph nodes in patients with clinically N0 oral and oropharyngeal squamous carcinoma. In this series, 49 of the SOH neck dissections were extended to level IV (Figure 1, right).

The overall actual median survival was 27 months with a range from 0.1 to 157 months. Only 5 patients (3.3%) were lost to follow-up within 5 years. A total of 21 patients (13.6%) were lost to follow-up after 5 years (all without recurrences). The site of neck recurrence was considered inside the limits of neck dissection when it occurred within the operative region on the neck. Because the procedure included the cranial triangle of the accessory nerve at level II, recurrences at this site were considered within the limits. The recurrences that occurred in other sites of the neck were considered beyond the limits of SOH dissection.

Statistical analysis was performed using the SPSS program (SPSS Inc, Chicago, Ill, version 8.0). The differences found in the groups were compared by the Fisher exact and \( \chi^2 \) tests.

whether the disease was confined to the lymph nodes or extended to the extracapsular soft tissues in those who had metastases cannot be presented because the capsular status was not routinely reported before 1992.

Thirty of the 37 patients with metastatic lymph nodes (81.1%) underwent postoperative radiotherapy. Of the 117 patients with pathological stage (p) N0 necks, 38 (32.5%) underwent postoperative radiotherapy owing to close or involved surgical margins, perineural infiltration, vascular embolization, or stage III or IV tumors. Of the 49 patients who underwent extended SOH, none had neck metastases at level IV. There were 32 local recurrences (21.3%) and 7 neck recurrences (4.5%) in standard SOH dissections (4 cases) and extended SOH dissections (3 cases) (Figure 2). Two recurrences occurred in patients with occult neck metastases and 5 in patients with pN0 necks. Three patients (1.9%) had local and neck recurrences at the same time. There was no significant difference in the distribution of recurrences (inside or beyond the limits of the SOH neck dissection) by pathological status of lymph nodes. The distribution by site of recurrence and correlation with pathological status of lymph nodes and postoperative radiotherapy is summarized in Figure 3. The most significant finding is that neck recurrences are related to the most aggressive and advanced tumors in pathologically negative necks (that were selected for postoperative radiotherapy owing to stage T3 or T4 tumors, positive margins, vascular embolization, or perineural infiltration). The difference (4/38 vs 1/79) is statistically significant (P = .05, Fisher exact test).

The use of SOH neck dissection as a staging and therapeutic procedure for oral and oropharyngeal carcinoma in N0 necks has been reported in several studies.1,2,6,7,10 The incidence of occult metastasis in elective neck dissection varies from 15% to 31%.1,2,6,10 We found in this series 34 pN+ cases (24.0%).

The incidence of neck recurrences at the dissected side of the neck varies according to the clinical stage, pathological findings, and whether the patient undergoes postoperative radiotherapy.1,2,12 Spiro et al10 described neck recurrences in 5% of patients with pN0 necks, and 20.9% of patients with pN+ necks, despite the fact that 86% of the patients with pathological lymph nodes had undergone adjuvant radiotherapy. Byers1 found a 10% neck recurrence rate after SOH dissection for oral and oropharyngeal carcinoma. The difference was only statistically significant when comparing patients with oral cavity carcinoma and extracapsular invasion treated with surgery and radiotherapy with those treated with surgery alone. Other studies showed that neck recurrences after SOH neck dissection can vary from 4.8% to 16%.1,5-7 We found a 4.5% neck

COMMENT

The overall actual median survival was 27 months with a range from 0.1 to 157 months. Only 5 patients (3.3%) were lost to follow-up within 5 years. A total of 21 patients (13.6%) were lost to follow-up after 5 years (all without recurrences). The site of neck recurrence was considered inside the limits of neck dissection when it occurred within the operative region on the neck. Because the procedure included the cranial triangle of the accessory nerve at level II, recurrences at this site were considered within the limits. The recurrences that occurred in other sites of the neck were considered beyond the limits of SOH dissection.

Statistical analysis was performed using the SPSS program (SPSS Inc, Chicago, Ill, version 8.0). The differences found in the groups were compared by the Fisher exact and \( \chi^2 \) tests.
The sites of neck recurrences have been described.2,3,10 Byers2 showed that for oral cavity and oropharyngeal carcinoma treated with SOH neck dissection, neck recurrences occurred more frequently inside the limits of the neck dissection (74%). However, Byers et al.,3 analyzing only oral tongue cancer, found that neck recurrences occurred more often beyond these limits. On the other hand, patients with floor-of-mouth cancer had more recurrences inside these limits. Spiro et al.10 concluded that neck recurrences in the dissected side of the neck occurred preferentially beyond the limits of dissection (58.4%). We found neck recurrences in 4.5% of the patients receiving elective SOH dissections, and these occurred either beyond (3 cases) or inside (4 cases) the limits of the dissection.

Most neck recurrences in our series were in patients who underwent postoperative radiotherapy. This strongly suggests that such recurrences are more related to the biological aggressivity of the cancer or to the advanced pathological stage than to technical problems with SOH dissections (ie, missing microscopically involved lymph nodes). Carvalho et al.14 showed that the experience of the surgeon has a minor influence on the rates of neck recurrences in patients with laryngeal carcinoma submitted to type III modified neck dissections. There is no such information for SOH neck dissections; however, most authors emphasize, and we agree, that selective neck dissections are more difficult and should be performed by surgeons who have specific training and who perform head and neck surgery on a daily basis.

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