Quality of Life After Great Auricular Nerve Sacrifice During Parotidectomy

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Objective: To determine the impact of great auricular nerve (GAN) sacrifice during parotidectomy on patients' quality of life.

Design: Historical cohort survey of patients who had undergone GAN sacrifice during parotidectomy.

Setting: Tertiary academic otolaryngologic practice.

Patients and Methods: Fifty-three patients who had undergone GAN sacrifice during parotidectomy completed an 8-item quality-of-life survey with a 7-point response scale designed to measure outcome after GAN sacrifice during parotidectomy.

Results: Thirty patients (57%) reported experiencing at least 1 abnormal symptom, but the mean number of symptoms decreased significantly with time, from a mean of 2.3 during the first year to 0.2 after 5 years (*P* < .001).

Even among patients experiencing symptoms, 23 (77%) reported only a little or no bother caused by the symptoms, and 27 (90%) reported no interference or almost none with their daily activities. The degree of bother or interference reported had a moderate positive correlation with the number of abnormal sensations reported.

Conclusions: The results suggest that, while many patients experienced sensory deficits, the overall quality of life was not significantly affected after GAN sacrifice during parotidectomy. Patients who report multiple abnormal sensations, however, would benefit from additional counseling and from reassurance that the number of sensations will diminish with time. Further study evaluating the effect of preservation of the posterior branch of the GAN during parotidectomy on patients' quality of life is needed.

PATIENTS AND METHODS

The cohort for the study consisted of 75 patients who had undergone GAN sacrifice during parotidectomy at the State University of New York Health Science Center at Brooklyn and its affiliated hospitals. Subjects were identified through review of medical records. Exclusion criteria included patients who had undergone a second surgical procedure at the time of parotidectomy, such as a neck dissection, and patients who could not be contacted for participation in the study, because of change of address or death. Inclusion criteria included a minimum of 3 months’ follow-up, age older than 18, and English literacy. Data obtained from the remaining 53 patients’ medical charts included age, sex, time since surgery, surgical procedure, and final surgical pathologic findings.

A quality-of-life survey consisting of 8 questions was designed to measure outcome after GAN sacrifice during parotidectomy (Figure). Face validity was ensured through targeted discussion with other otolaryngologists and head and neck surgeons and by discussion with patients. In designing the survey, a 7-point ordinal response scale was used for most questions to increase reliability. Survey research suggests that the minimum number of categories used by raters should be 5 to 7. In addition, the 7-point responses for the questions assessing frequency, severity, and degree of interference were adapted from previously validated health-related quality-of-life surveys. The survey was administered to and completed by the patients 3 to 69 months after surgery.

Statistical analyses of the data were performed using commercially available software for medical statistics. Differences were considered significant at P<.05 (2-tailed). Relationships between survey question responses were assessed using correlation coefficients based on a priori hypothesis. Spearman rank correlation was used, which is a distribution-free method suitable for the modest sample size in this study.

and December 30, 1998. The mean ± SD age was 54 ± 16 years (range, 20-84 years). Twenty-eight (53%) of the patients were men. Surveys were completed a median of 22 months after surgery (range, 3-69 months). At least 15 months of follow-up data were available for 40 (75%) patients. Forty-six patients underwent a superficial parotidectomy; 1 patient, a subtotal parotidectomy; and 6 patients, a total parotidectomy. The most common surgical pathologic finding was pleomorphic adenoma, followed by Warthin tumor, benign lymphoepithelial lesion, chronic sialadenitis, and low-grade mucoepidermoid carcinoma (Table 1).

Thirty patients (57%) reported experiencing at least 1 or more abnormal sensations in the ear or neck region after surgery, including pain in 5 (9%), burning in 1 (2%), stinging in 2 (4%), discomfort in 5 (9%), hypersensitivity in 4 (8%), lack of feeling in 24 (45%), lack of sensitivity in 13 (25%), or other abnormal sensation in 8 (15%). Only 1 abnormal sensation was noted by 12 (23%), but 10 (19%) had 2, 5 (9%) had 3, and 3 (6%) complained of having at least 4. The number of abnormal sensations reported had a moderate inverse

Table 1

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
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<tbody>
<tr>
<td>1) Please check any of the following sensations you may be experiencing around your ear or neck since your surgery.</td>
<td></td>
</tr>
<tr>
<td>Stinging</td>
<td></td>
</tr>
<tr>
<td>Abnormal sensation</td>
<td></td>
</tr>
<tr>
<td>Burning</td>
<td></td>
</tr>
<tr>
<td>Lack of feeling</td>
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<tr>
<td>Pain</td>
<td></td>
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<tr>
<td>Lack of sensitivity</td>
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<tr>
<td>Discomfort</td>
<td></td>
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<tr>
<td>Hypersensitivity</td>
<td></td>
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</tbody>
</table>

If you did not check any of the above, you may stop here. Otherwise, please complete the remainder of the survey.

2) How often have you experienced any of the above sensations within the past month?
1- Never
2- Almost none of the time
3- A little bit of the time
4- Some of the time
5- A good bit of the time
6- Most of the time
7- Always

3) How long does it last?
1- Up to 1 minute
2- Up to 10 minutes
3- Up to 30 minutes
4- Up to 60 minutes
5- Up to 12 hours
6- More than 1 day
7- All the time

4) How much does it bother you?
1- Not at all
2- Almost none
3- A little
4- Somewhat
5- A good amount
6- A lot
7- A tremendous amount

5) How large is the affected area?
1- Smaller than the size of a penny
2- About the size of a penny
3- About the size of a quarter
4- About the size of a half-dollar
5- Larger than the size of a half-dollar

6) How much does it interfere with your daily activities?
1- Not at all
2- Almost none
3- A little
4- Somewhat
5- A good amount
6- A lot
7- A tremendous amount

7) How does it interfere with your daily activities? (shaving, combing your hair, etc)
1- Never
2- Almost never
3- A little bit of the time
4- Some of the time
5- A good bit of the time
6- Most of the time
7- All of the time

8) How often are you worried or concerned about any of the above sensations?
1- Never
2- Almost never
3- A little bit of the time
4- Some of the time
5- A good bit of the time
6- Most of the time
7- All the time

Thank you for taking the time to answer the following questions regarding your parotid surgery. Please answer as accurately as possible.
correlation with time since surgery ($r = -0.50$, $P<.001$), suggesting gradual symptom resolution. As shown in Table 2, 8 patients reported a mean of 2.3 symptoms during the first year after surgery, but 5 patients who were surveyed 5 or more years after surgery had a mean of only 0.2 symptoms. Conversely, the number of symptoms reported did not correlate with patient age ($r = -0.05$, $P = .75$).

Among the 30 patients reporting at least 1 abnormal sensation, the problem was present most or all of the time in 15 (50%) (Table 3). Duration showed a bimodal distribution (Table 4), with 9 patients (30%) having symptoms lasting 10 minutes or less and 21 (70%) having them last longer than 1 day. Eighteen patients (60%) reported continuous problems.

The degree of bother caused by the abnormal sensations was generally mild (Table 5). Seventeen patients (57%) reported the symptoms to be trivial (ie, no bother or almost no bother), and only 1 patient (3%) considered the sensations a tremendous bother. The degree of bother had a moderate correlation with the number of sensations reported ($r = 0.54$, $P = .002$) and showed a trend toward reduced levels as time passed after surgery ($r = -0.32$, $P = .09$). The degree of bother did not correlate significantly with the frequency or duration of abnormal sensation (Tables 3 and 4) and showed no relationship to the reported size of the affected area (Table 6).

Three patients (10%) thought that their abnormal sensations interfered significantly with performance of their daily activities (Table 7). The degree of interference had a moderate correlation with the number of sensations reported ($r = 0.53$, $P = .003$) but had no relationship to the passage of time. Eight patients (27%) reported having at least some worry or concern because of their symptoms, and 2 (7%) reported being worried or concerned most or all of the time (Table 8). The degree of worry or concern had a small correlation with the number of sensations reported ($r = 0.38$, $P = .04$) but had no relationship to the passage of time.
The GAN is often sacrificed or accidentally injured during various surgical procedures, such as parotidectomy, neck dissection, rhytidectomy, and excision of lateral neck masses. Although morbidity following GAN section is clearly recognized, few studies have evaluated its effect on patients’ quality of life.

Schultz et al. evaluated donor site morbidity in 29 patients who underwent GAN graft procurement for repair of lingual or inferior alveolar nerves. They reported symptomatic nerve injury in 46% of patients, with spontaneous resolution in 54% of those. They conclude that, while morbidity following GAN procurement for reconstruction following ablative tumor surgery may be perceived as minor, nerve removal for repair of lingual or inferior alveolar nerve injuries following elective orthognathic or dentoalveolar surgery may assume greater significance.

Our study indicates that abnormal sensations following GAN sacrifice during parotidectomy are common, occurring in 30 patients (57%). While 12 (23%) reported 1 abnormal sensation, 10 (19%) reported 2, and 8 (15%) reported 3 or more. The most commonly reported problems included lack of feeling and lack of sensation. However, with the passage of time, there was a significant decrease in the number of reported symptoms. Out of 8 possible abnormal symptoms, patients reported a mean of 2.3 symptoms during the first year after surgery, 0.5 symptoms between the second and third postoperative years, and only 0.2 symptoms 5 or more years following surgery. This is likely the result of several factors, including partial regeneration of cutaneous sensory nerve fibers, collateral innervation from the lesser occipital nerve posteriorly and the transverse cutaneous nerve anteriorly, and patients’ acclimation to any deficits.

Even among patients who perceived abnormal symptoms following surgery, only 4 (13%) were bothered a good or tremendous amount by the symptoms. Likewise, 27 (90%) of these patients reported almost no or no interference with daily activities. These findings indicate that the quality of life of most patients was not significantly affected after GAN sacrifice during parotidectomy. The number of abnormal symptoms experienced by the patients correlated with the degree of bother and activity interference. Problem areas identified by some patients included difficulty in wearing earrings, combing hair, using the telephone, and shaving.

Eight patients (27%) with abnormal symptoms reported being worried or concerned about their symptoms at least some of the time. The level of concern or worry had a mild correlation with the number of symptoms reported and had no correlation with the passage of time.

Given the relationship between multiple symptoms reported and increased degree of bother, activity interference, and level of worry or concern, it may be prudent for the surgeon to spend additional time investigating complaints and working to reduce anxiety in patients reporting multiple symptoms. These patients should be informed that the number of symptoms experienced will decrease over time. A more thorough preoperative discussion explaining potential symptoms would likely be of benefit as well.

Preservation of the posterior branch of the GAN during parotidectomy and other surgical procedures is not a new concept and has been discussed in the literature by several authors. Brown and Ord showed significantly less sensory loss to the skin of the ear and the angle of the mandible in 6 patients in whom the posterior branch was preserved, compared with 6 patients in whom it was sacrificed. They noted an additional operating time of 10 to 15 minutes required to identify and preserve the posterior division initially, which may decrease as the surgeon becomes more experienced with the procedure.

Christensen and Jacobsen evaluated 95 patients who underwent superficial parotidectomy. In their study, the posterior division of the GAN was able to be dissected free and preserved in 67 patients (70.5%). They noted a significantly higher percentage of patients with subjective sequelae in the group in which the posterior branch was not preserved. However, they did not stratify patients based on time elapsed since surgery and did not specifically evaluate the effect of the subjective sequelae on patients’ quality of life.

Although not reported by any of the patients in our study, anecdotal stories and a case reported by Brown and Wake note that skin burns may also result as a consequence of GAN anesthesia.

Our study identified that the effect of GAN sacrifice was greatest in the first year and did not have a significant long-term effect on patients’ quality of life. It provides a basis for comparison for future studies evaluating donor site morbidity following GAN sacrifice.
Although a large number of patients experienced some abnormal sensation after GAN sacrifice during parotidectomy, it decreased significantly with time. Even among patients who experienced abnormal symptoms, most did not report any significant degree of bother, concern, or worry or interference with their daily activities. This indicates that the overall quality of life does not appear to be significantly affected after GAN sacrifice during parotidectomy. While preservation of the posterior branch of the GAN appears logical in patients in whom surgical or oncologic results would not be compromised, further outcomes study of preservation of the posterior branch during parotidectomy would help elucidate its effect on patients’ quality of life.

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REFERENCES