ABSTRACT: The purpose of this study was to examine the extent to which laryngeal cancer patients receive appropriate and adequate preoperative counseling before the surgical procedure known as laryngectomy. An online survey was presented to laryngectomized members of the WebWhispers Nu-Voice Club, which is an affiliated club of the International Association of Laryngectomees. The survey was designed to ascertain if laryngeal cancer patients are currently receiving comprehensive information regarding postsurgical communicative function. One hundred-fifty completed surveys were returned and analyzed. The results of the descriptive statistical analysis provided evidence that these patients continue to receive less than optimal preoperative counseling, if any at all. Suggestions for how speech-language pathologists can advance the importance of such counseling to better serve laryngeal cancer patients are then discussed.

KEY WORDS: laryngectomy, preoperative counseling, laryngectomee, alaryngeal voice, background noise

A diagnosis of laryngeal cancer can be devastating for both the patient and his or her family. They must face several difficult decisions about treatment options, the potential for major surgery, and the possibility of mortality (Cady, 2002). The American Cancer Society estimates that in 2004, approximately 10,270 people in the United States were diagnosed with laryngeal cancer, and the mortality rate was approximately 3,830 people (American Cancer Society, 2004). Although this type of cancer is not the most prevalent diagnosis among men and women, the physical, emotional, and communicative issues associated with laryngeal cancer makes this disease exceptionally significant. For those patients who are diagnosed with laryngeal cancer and undergo a laryngectomy, anxiety and fear about their preservation of function as well as their postsurgical quality of life can prove to be exceedingly distressing to them as well as their families.

Thus, it is crucial that patients who have been diagnosed with laryngeal cancer and who require a laryngectomy be counseled properly and appropriately with respect to various issues regarding their postsurgical quality of life. Of course, no amount of preoperative counseling can fully prepare a patient for the aftermath of such a significant surgery; yet, this preoperative counseling is essential in order to educate the patient with regard to alaryngeal voice restoration (Cady, 2002). Furthermore, there are several other aspects of care that should be addressed during preoperative counseling. These include strategies for effective symptom management, safety issues, nutritional and speech therapy support, and coping strategies (Cady, 2002). It will also be necessary to convince the patient of the importance of intervention and to prepare him or her for the consequences of the surgery (Depondt & Gehanno, 1995). Conscientious and systematic preoperative counseling may improve the outcome for many patients who may experience difficulty adjusting to life after the surgery.

Keith, Linebaugh, and Cox (1978) conducted a study in order to examine the current preoperative counseling practices, counseling deficits, and needs perceived by the laryngectomee patient and his or her family. They surveyed several individuals who had undergone a laryngectomy. The
results of the survey showed that there was considerable discrepancy between the actual counseling that the patients received and what the patients considered ideal. For example, most of the patients they surveyed received counseling from their surgeon only as opposed to other disciplines that can aid in the counseling and rehabilitation process, such as a speech-language pathologist (SLP). In fact, many of the patients indicated that they felt that being counseled by such professionals as nurses, SLPs, and even recovered laryngectomees would have proven to be highly beneficial to them and would have helped to ease them in adjusting appropriately to life after the larynectomy (Keith et al., 1978). Thus, it was shown that the quality and quantity of the preoperative counseling for the laryngectomee was not sufficient and left much to be desired.

Those results are consistent with what Salva and Kallail (1989) found. They sought to survey the distinct counseling needs of male and female laryngectomees. A total of 327 surveys were distributed to individuals in 19 U.S. states and in Canada. The data from the surveys indicated that the largest percentage of laryngectomees (43.4%) reported that counseling was beneficial; however, 40% of the patients reported that they had received no counseling. In fact, one laryngectomee stated that she was told the night before her surgery that she would no longer have a larynx following the procedure. Additionally, a large percentage of laryngectomees (47.5%) reported that they had not been exposed to alternate modes of communication before the operation (Salva & Kallail, 1989).

More recently, Zeine and Larson (1999) conducted a study to determine if the preoperative counseling services that are provided to laryngectomy patients had improved since the Keith et al. (1978) study. More specifically, they wanted to determine whether more counseling was occurring and if the information provided was more complete and satisfactory to the laryngectomy patients. A total of 300 questionnaires were distributed to 225 laryngectomees and 75 spouses of laryngectomees. The questions included in the survey were designed to obtain information on the quality and quantity of counseling available to the patients. The results of the survey showed that only 53% of the laryngectomees reported that they were satisfied with the information that was given to them before surgery. Furthermore, when asked if they were told that following the laryngectomy they would not be able to speak, 21% of the laryngectomees and 29% of the spouses stated that they had not been informed of such issues preoperatively. Only 34% of the laryngectomees reported that they were informed about alternate modes of communication available to them before the surgery, whereas 61% of the laryngectomees stated that they were informed of the speech options only after the procedure.

Another common complaint that laryngectomees report relates to their inability to communicate effectively in the face of background noise, and that this problem was not explained to them preoperatively or, for that matter, postoperatively. This complaint has been anecdotally yet very consistently reported in clinical settings that serve alaryngeal patients. Research on the extent to which background noise influences the intelligibility of alaryngeal speech is very limited. This is troubling because laryngectomees encounter noise-related communicative obstacles in their social exchange just as laryngeal speakers do. In previous studies of the relationship between laryngeal speech intelligibility and background noise, it has been demonstrated that word identification decreases as competing noise levels increase (Gordon-Salant, 1985; McColl, Fucci, Petrosino, Martin, & McCaffrey, 1998; McColl & McCaffrey, 2003). If patients about to undergo a laryngectomy were made aware of the difficulty that they will encounter in being understood in noisy environments, they could begin to form strategies that would maximize their intelligibility in adverse signal-to-noise ratio situations.

The findings of these studies are significant. The data indicate that the preoperative counseling that is provided to laryngectomees has been insufficient for a period of time. Despite efforts to improve preoperative counseling for laryngectomy patients, a great number of laryngectomees are still not being adequately informed about the loss of speech and about alaryngeal voice restoration options available to them before or after the surgery. Although there have been many studies advocating improvement of preoperative counseling for laryngectomees in order to help them adjust in both social and speech rehabilitation, substantial improvement still has not occurred. Thus, the SLP should be a primary leader in providing such counseling. SLPs are educated about various alaryngeal voice restoration options and are knowledgeable about the communicative consequences the patients will experience postsurgically. Moreover, SLPs specialize in the treatment of communication disorders and are best suited to aid in the preoperative counseling of patients who will be undergoing a laryngectomy and who will inevitably need speech therapy. Also, SLPs are aware of compensatory strategies that laryngectomees can employ to increase their communicative function in noisy environments. Preoperative counseling by an SLP can prove to be instrumental in preparing a laryngectomy patient for the effects of the surgery and can give them hope for functional communication through information about alaryngeal voice restoration options.

The present study was designed to determine the current state of preoperative counseling in laryngectomy. The goal was to obtain information from individuals who had undergone a laryngectomy and determine if they had received preoperative counseling before the surgery with respect to the resulting effects on their communication function, as well as options concerning forms of alaryngeal voice restoration and maximizing speech intelligibility in background noise. Previous research has demonstrated that this area needs further study in order to determine the most effective practices, and what can be done to increase the efficacy of preoperative counseling for laryngectomees from an SLP. Additionally, the use of the Internet to access information from a large and representative pool of laryngectomees will help in identifying the quality and quantity of counseling necessary to prepare patients for postsurgical communicative function.
Table 1. The survey.

1. What was your age at the time of the laryngectomy procedure?
2. What is your gender?
3. Did your surgeon or physician discuss the possibility of a primary tracheoesophageal (TE) puncture prior to the removal of your larynx?
4. Prior to the laryngectomy, did your surgeon or physician make you aware of the fact that you would not be able to produce voice following the surgery?
5. Were you seen by a speech-language pathologist prior to the laryngectomy to discuss possible methods of alaryngeal voice restoration?
6. If you did not see a speech-language pathologist prior to the laryngectomy, do you believe that such a consultation would have been beneficial? In answering this question, use a seven-point scale, with number one being least beneficial and number seven being most beneficial.
7. What is your primary method of alaryngeal voice: electro-arynx, esophageal speech, or TE speech?
8. To what degree does background noise interfere with your ability to be understood? In answering this question, use a seven-point scale, with number one being most understood and number seven being least understood.
9. Do you avoid speaking in noisy environments because people cannot understand you? In answering this question, use a seven-point scale, with number one being most avoid speaking in noise and number seven being always avoid speaking in noise.

METHOD

University Institutional Review Board approval was granted for the present study involving the use of human subjects. An online survey (see Table 1) was presented to the members of WebWhispers Nu-Voice Club, which is an affiliated club of the International Association of Laryngectomees (IAL). Permission was obtained from the IAL to administer the survey on the WebWhispers listserv.

The survey was presented to all of the laryngectomized members of the listserv, which total several hundred at any given time. Once the survey was presented to the listserv members, 2 weeks were allowed for the completed surveys to be returned. Surveys returned after the 2-week deadline were not included in the study. Completed surveys were returned online to a university e-mail account. In order to maintain subject confidentiality, all names and identifying information were removed from the surveys, which were then coded numerically.

The total number of surveys returned within the 2-week data collection period was 162. Twelve of the returned surveys were omitted from the data set due to survey items not being answered in the format requested, incomplete surveys, or survey answers that included anecdotal information that deviated from the questions asked. The results of the 150 completed surveys were tabulated using a Microsoft Excel spreadsheet.

RESULTS AND DISCUSSION

The average age for the participants at the time of the laryngectomy surgery was 53:4 (years;months). Participant ages ranged from 37 to 82 years. It was surprising to see that a significant number of respondents were in their late 30s and early 40s. Age is an important factor when considering issues of counseling in alaryngeal voice restoration. These patients are relatively young, and they also have a very high cancer survival rate of approximately 65% (American Cancer Society, 2004). The implication is that the typical laryngectomee can look forward to a long life after the surgery. As medical technologies advance and as cancer treatment becomes more effective, laryngectomees will continue to enjoy higher survival rates long after their surgery. Given the importance that humans place on communicative function, establishing an efficient method of alaryngeal voice restoration is essential for quality-of-life purposes. For this reason, all of the methods of alaryngeal voice restoration should be explained to the patient preoperatively.

Alaryngeal voice restoration often involves the use of an electronic or pneumatic artificial larynx, training in esophageal speech, or the surgical-prosthetic approach of tracheoesophageal (TE) puncture voice restoration (Blom & Hamaker, 1996). TE speech rehabilitation requires a surgical procedure involving creation of a puncture through the posterior tracheal wall and the anterior esophagus at the vertical level of the patient's tracheal opening or stoma. A silicon shunt is then inserted into the puncture, creating a passage between the trachea and esophagus. The silicon shunt, commonly referred to as a voice prosthesis, serves as a one-way valve, allowing the patient to channel air into the esophagus upon exhalation by either digital or tracheostoma valve occlusion of the stoma. The pulmonary air entering the esophagus through the tracheoesophageal puncture travels superiorly as it is pushed through the pharyngoesophageal (PE) segment upon exhalation. As the air passes through the upper esophagus, the PE segment is set into a vibratory pattern, similar to the noise associated with belching. The sustained vibration of the PE segment during exhalation becomes the primary sound source for TE speech.

The gender of respondents proved interesting. Of the 150 participants in our study, 108 were male and 42 were female. This is a ratio of 2.6 males for every female. If one looks at the history of this ratio, it becomes evident that the gender gap with regard to laryngectomy is closing. In the early 20th century, when it was illegal for women to smoke in public, the gender ratio was 15 males for each female. This is a ratio of 2.6 males for every female. If one looks at the history of this ratio, it becomes evident that the gender gap with regard to laryngectomy is closing. In the early 20th century, when it was illegal for women to smoke in public, the gender ratio was 15 males for each female. Over the years, the number of women who smoke has increased and is now equal to the number of men who smoke. This is undoubtedly related to the increased incidence of laryngeal cancer in women. This is important when considering preoperative counseling, as some, but not all, female laryngectomees have reported that they find the use of esophageal speech repellent (Ross, 1998). Cosmetic considerations should also be addressed with the patient regarding the stoma. It has been reported that many patients, especially women, are embarrassed to wear open collar garments that reveal their stoma (Bishop-Leone, 1998). The SLP could provide examples of fashionable stoma covers and ascots in order to address a patient’s anxiety involving stomal issues.
When asked if their surgeon or physician discussed the possibility of a primary TE puncture before the laryngectomy, 66 respondents answered yes and 84 answered no. A question arises: Why aren’t more of these patients being made aware of the TE puncture? There are certainly patients who are not good candidates, for instance, those with subglottal or supraglottal cancer involvement. It is apparent, however, that many of the 84 participants who were not made aware of the possibility of TE speech would have been prime candidates for the primary puncture. Many respondents provided additional comments associated with this question that were quite emotional and even angry. One male respondent reported that his surgeon had done him and his family a huge disservice by not explaining the possibility of TE speech. The respondent added that he had not seen an SLP preoperatively, and that such a visit would have “meant the world to me.”

Thirty of the 150 respondents were not made aware of the fact, by their physician or surgeon, that they would not be able to produce voice following their surgery. This finding is troubling, as all patients who undergo a major surgery should be well informed of such important postsurgical outcomes.

Of the 150 participants, only 60 were seen by an SLP before the laryngectomy to discuss possible methods of alaryngeal voice restoration. This, too, is unacceptable, and it is the responsibility of the SLP whose practice includes laryngectomy to advance our discipline’s role in this regard. This can be achieved through providing inservice training to local otolaryngology offices in order to make those physicians aware of the important contributions we can make in the overall care of their laryngeal cancer patients. The 90 respondents who were not seen by an SLP preoperatively were then asked, as a follow-up question, if such a consultation would have been beneficial. In answering this question, they used a 7-point scale, with number 1 being least beneficial and number 7 being most beneficial. The mean rating from the 90 respondents was 6.3. Clearly, they felt that preoperative counseling from an SLP would have been of great benefit to them.

The survey asked what form of alaryngeal voice restoration was used as their primary mode of communication. Thirty-six respondents used TE speech, 18 relied primarily on esophageal speech, and a surprisingly high number of 96 reported the electrolarynx as their method of choice. This is important information, as many SLPs do not know how to properly use an electrolarynx themselves, let alone teach the use of such a device in a therapy setting. The four main goals of electrolarynx training of timing, seal, placement, and over-articulation should be mastered by the SLP who works with laryngectomies. Also, there are many competent SLPs who cannot produce efficient esophageal speech. The question becomes whether SLPs need to be able to produce esophageal speech themselves in order to teach esophageal speech to patients. The SLP may wish to contact a local chapter of the IAL, such as a community Lost Cords Club support group. The SLP could recruit an efficient esophageal speaker to provide a model of effective esophageal speech to the preoperative patient.

Esophageal and TE speech intelligibility has been reported to be especially susceptible to degradation in background noise (Gordon-Salant, 1985; McColl & McCaffrey, 2003; Ross, Huntington, Newby, & Dixon, 1965). When asked to rate the extent to which background noise interferes with their ability to be understood using a 7-point scale, with 1 being least understood and 7 being most understood, the respondents’ average rating was 2.1. As a follow-up, they were asked to rate the extent to which they avoided speaking in noisy environments because of this difficulty, with number 1 being never avoid speaking in noise and number 7 being always avoid speaking in noise. The average rating for this question was 4.7. Clearly, the participants of this study have much difficulty communicating effectively in the face of background noise. This issue could well be addressed and incorporated into a thorough preoperative counseling protocol.

One such preoperative counseling goal would focus on the need of the patient to provide especially rich semantic and syntactic cues to listeners when speaking in unfavorable noise environments. Focusing on topic maintenance and exposing the patient to the concept of top-down information strategies could be of great benefit to their communication effectiveness. SLPs might address aspects of word duration by exposing the patient to SPIN noise while timing their vocal productions. The goal of this therapy technique would be met when the patient learned to maintain standard length word productions in noise just as they would in quiet conditions.

The SLP should address body proxemics during preoperative intervention, perhaps suggesting that the patient stand closer to their listeners in noisy conditions. This therapy technique should include a reminder that in our particular culture, three feet normally separate the speaker from the listener during casual conversation. Patients would be well advised to explain their speaking difficulties when encroaching into a stranger’s personal space, should the need arise in a noisy environment.

Patients might consider carrying an electrolarynx if noisy situations are anticipated. The most updated models can produce over 80 dB SPL, and training in functional electrolarynx use takes very little time (Ross, 1998). A practical technique could be employed where noise is introduced in the therapy setting at varying degrees of intensity. The patient would be required to learn to recognize the level at which reliance on the electrolarynx was of most benefit. The therapy would be enhanced if the patient brought a significant other person into the clinical setting, perhaps increasing the importance placed on the dialog. All of this could become an important part of a comprehensive preoperative intervention protocol. For patients who find the use of an electrolarynx undesirable, personal amplification systems are available. The amplification systems range in size from units as small as transistor radios to larger, more powerful systems equal in size to a large purse. The quality of the amplified speech produced by such units varies greatly; to date, scientific data comparing their intelligibility appear unreported. Such an inquiry may provide valuable information for laryngectomies who frequently encounter noise situations.
As a discipline, we are in the position to promote the importance of preoperative counseling in laryngectomy. By doing so, we can help those facing the challenges of laryngectomy to be better prepared for their postsurgical communicative function. The profession of speech-language pathology has made significant progress in advancing our role in helping to improve the quality of life for laryngectomees. We must continue to grow in this regard. By doing so, we fulfill our commitment to hold as paramount the welfare of those we serve.

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