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Routine Use of Nasendoscopy to Enhance the Speech and Language Therapist’s Decision-Making Process in Surgical Voice Restoration

Sarah Pilsworth, MSc

Abstract

Objective. To discover whether the routine use of nasendoscopy adds to the speech and language therapist’s (SLT’s) clinical judgment.


Setting. Outpatient and inpatient settings in a cancer center.

Subjects and Methods. All laryngectomees who met the inclusion/exclusion criteria were assessed by means of a questionnaire, clinical checks, and nasendoscopy. Comparison of data was undertaken.

Results. A total of 50 reviews were conducted over the 4-month data collection period. Nasendoscopy was successfully performed on 45 occasions. In 31 episodes, additional information was gained by conducting the nasendoscopy assessment following the SLT’s clinical assessment. In 22 patients, the presence of granulation or excess tissues interfering with valve placement was identified through the use of nasendoscopy, and in 2 of these patients, action was required to prevent accidental closure of the tracheoesophageal fistula (difficulties that were not identified on clinical examination alone).

Conclusions. Nasendoscopy assessment is a relatively quick, inexpensive, and accessible tool that is well tolerated by patients. Its use helps to identify patients who are at potential risk of complications with voice prosthesis changes and even at risk of accidental closure of the tracheoesophageal fistula through the presence of granulation tissue at the posterior end of the tract. With the use of routine nasendoscopy, these patients can be identified and reviewed more regularly to monitor and manage these problems accordingly. Nasendoscopy warrants consideration as a routine component of review appointments for patients who have undergone surgical voice restoration.

Keywords

surgical voice restoration, laryngectomy, speech and language therapy, tracheoesophageal voice prosthesis

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The care of tracheoesophageal voice prostheses (TEPs) is carried out by the medical staff or speech and language therapists (SLTs) in the early stages of recovery and in later stages may still be their responsibility, although depending upon their dexterity and other skills, Blom et al1 suggest that some patients and carers can be taught how to manage the prostheses independently.

As the TEP must fit well to function properly and safely to keep aspiration to a minimum and allow optimum voicing to be produced, it is changed at least every 6 months. When it is changed, a series of checks inform the therapist as to whether the TEP is correctly sized and positioned. Even with the use of these tests and training to staff and patients regarding potential complications, instances have occurred in which the TEP has closed over (at the esophageal end of the tracheoesophageal fistula [TEF]) due to an ill-fitting or displaced prosthesis.

Nasendoscopy has been routinely used by the medical team to view the nasal cavity, pharynx, and larynx for a number of years and in laryngectomy patients can be used to view the newly constructed neopharynx and then placed further into the esophageal tract to view the TEP in the esophagus.

This research aimed to improve the assessment of voice prosthesis placement through the use of nasendoscopy, to safeguard against accidental closure of the TEF where this occurs because of an ill-fitting prosthesis.

Literature Review

A literature search was conducted on the major health-related databases (MEDLINE, EMBASE, CINAHL, PsychINFO, and the Cochrane site) to find relevant articles on laryngectomy care, postoperative management of laryngectomees, surgical
voice restoration, and complications associated with TEFs and TEPs.

Books, Web sites, and courses relating to laryngectomees were also accessed to find evidence for the current care provided by SLTs and medical teams. No previous work investigating the use of nasendoscopy with laryngectomees to assess TEP placement was found. Literature on the clinical checks made at TEP sizing and placement was also lacking and was described only briefly in some of the texts that were viewed.1-4

Articles5-8 do describe the use of endoscopy with laryngectomized patients, but these studies use a rigid laryngoscope along with high-speed digital imaging to assess the vibrations of the neoglottis and do not specifically endeavor to view the TEP itself.

Method
The design of this prospective study was quasi-experimental.

A prospective (nonrandomized) study was undertaken through a series of case studies, assessing patients using 2 different means: clinical checks and then nasendoscopy. The data were collected from each, and analysis of the common themes and results was undertaken.

The research was approved by the local research ethics committee and the Trust’s Research and Development Department.

All laryngectomees who were registered as patients at the cancer center who met the inclusion/exclusion criteria (see Table 1) were sent details of the research asking that they contact the SLT department if they wished to be included in the study.

On attendance at their next appointment, participants in the research were first assessed by a member of the team using the standard clinical checks. The clinician then agreed on a course of action based on that clinical judgment, and this decision was documented.

Nasendoscopic examination was then conducted on the patient, and again, the clinician’s decision, findings of the assessment, and appropriate course of action were noted. A log was kept of all patients entered into the study, with the clinical findings, nasendoscopic findings, clinical judgments, and subsequent outcomes following these 2 assessments. The data collected were placed into Excel spreadsheets and analyzed with the StatXact-4 program.

A short questionnaire (see the online appendix) was also completed at each appointment by the clinician and patient to show the reason for the review appointment and to gather the patients’ views on the use of the nasendoscope (and the benefits of the anesthetic spray, if used). The questionnaires were gathered, and qualitative analysis was made by studying each form and summarizing the free text, looking for themes developing in the responses. The multiple-choice and closed questions that pertained to the appointment and any presenting difficulties were inputted into Excel for analysis of frequency.

Results
Data collection for the research took place over 4 months. A total of 50 separate assessments (episodes) were conducted on 18 patients (cases) over 15 weeks. The age range of the subjects was from 39 years to 83 years, with a mean of 65.94 years. Two of the cases were women, and 16 were men.

Over the 50 assessments, bedside clinical assessment led to a change in management (valve changed like for like, valve changed to alternative type or size, or other intervention conducted) on 37 occasions. After this intervention, the patient would usually have been sent home with a review appointment or an open review.

The following nasendoscopic examination was successfully conducted (ie, TEP or TEF was able to be viewed) on 45 episodes, and in 14 of these, the assessment agreed completely with the clinical findings. In 31 episodes, the nasendoscopy gave additional information that led to different management of the patient. In 22 patients, the presence of granulation or excess tissues interfering with valve placement was identified through the use of nasendoscopy, and in 2 of these patients, action was required to prevent accidental closure of the TEF (difficulties that were not identified on clinical examination alone).

This change in management following nasendoscopy helped to manage potential complications, and during the course of the research, no accidental closures of the tract occurred.

In those episodes in which nasendoscopy was not successful (5 occasions out of the total), 1 patient was not able to tolerate nasendoscopy even with administration of the local anesthetic spray due to hypersensitivity in the nasal cavity and high anxiety. One patient had a known esophageal stricture.

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Table 1. Inclusion and Exclusion Criteria

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
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<tbody>
<tr>
<td>Laryngectomees with surgical voice restoration (tracheoesophageal puncture)</td>
<td>Patients too unwell to tolerate nasendoscopy (eg, terminal patients)</td>
</tr>
<tr>
<td>Laryngectomees who are able to consent to involvement in the study</td>
<td>Patients requiring home/domiciliary visits</td>
</tr>
<tr>
<td>Laryngectomees who are able to tolerate nasendoscopy (with local anesthetic use if needed)</td>
<td>Patients within 1 mo of primary SVR or 2 wk of secondary SVR</td>
</tr>
<tr>
<td>Laryngectomees who have had a primary TEF and have had a TEP in place for more than 1 mo or who had a secondary TEF and have had a TEP in place for more than 2 wk</td>
<td></td>
</tr>
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</table>

Abbreviations: SVR, surgical voice restoration; TEF, tracheoesophageal fistula; TEP, tracheoesophageal voice prostheses.
(requiring frequent dilatation to enable successful eating and drinking), and nasendoscopy was attempted twice without success.

On 2 other occasions, 2 separate patients were unsuccessfully scoped but then on a further subsequent visit were scoped successfully (for 1 patient, the addition of anesthetic spray seemed to improve the patient’s tolerance). Various strategies were tried with each patient to allow for easier passage of the camera.

Both of the SLTs completed individual logs of their decisions before comparing these within the session; these showed complete agreement in their findings and clinical judgments for both the clinical assessment and nasendoscopic assessment when joint assessments were conducted. Assessments conducted jointly with other members of the multidisciplinary team (clinical nurse specialist; ear, nose, and throat (ENT) consultant; and ENT registrar) also showed 100% agreement in the decision-making process. A random sample of 10 recordings of nasendoscopies was also shown to an ENT consultant with experience in laryngectomy care. This was to seek validity of the results, and 100% agreement on the analysis and management plans derived from this was achieved. Analysis of the nasendoscopic DVD recordings on repeat occasions by the SLTs also showed 100% agreement in the findings, showing strong intrarater reliability.

All questionnaires that were administered were completed fully by the patients, as they were completed during the review appointment.

The main difficulty encountered that caused patients to request a review appointment was leaking through or around the prosthesis (7 occasions). The second most frequent reason for requesting a review was the presence of altered tissue around the valve (7 occasions).

Of the 16 appointments that were deemed an emergency by the SLT team (problems requiring access to an appointment on the same day or within 2 days of identification), only 4 were seen within the time criteria. Nine episodes took between 3 and 7 days to be seen, and 3 waited for more than 2 weeks before seeking assistance. Reasons given by the patients for delaying access to a review appointment are shown in Table 2.

Of the 50 nasendoscopies that were performed, 29 were conducted without the use of anesthetic. In the 21 cases in which anesthetic was used, this was administered initially due to either (1) the SLT’s knowledge of a preexisting need for it (ie, for patients with hypersensitivity) or (2) on request of the patient.

During 25 of the episodes, patients found the use of the flexible endoscopy uncomfortable. Twelve of these had anesthetic, but 13 did not. Out of those who rated the procedure as uncomfortable, 18 rated the discomfort as mild, 6 as moderate, and 1 as severe.

On 16 episodes, the procedure was deemed to have been made more comfortable by the use of the anesthetic spray. On 1 occasion, the patient felt that the anesthetic was not helpful, and in a further 4 episodes, the patient was not sure whether it had helped or not. One patient who did not have anesthetic reported that with previous use, he had not found it helpful and so had not requested it on this assessment. No harm or adverse events were encountered during this study.

Discussion

A sample of 50 separate assessment episodes was gathered. The patients involved in the study were mainly men, but this is representative of the head and neck cancer population. The age range spanned across 44 years, and the patients had varied clinical backgrounds, some having undergone preoperative oncological treatment and others undergoing radiotherapy following their laryngectomy.

The findings from the questionnaires gave both objective data on the rating of the nasendoscopy and anesthetic use along with subjective information about the reasons behind the patients delay to access treatment. These data has helped to inform future preoperative and postoperative training for patients, showing that a greater significance needs to be placed on the identification of problems and the speed at which they need to seek a review appointment.

Over the course of the data collection period, 90% of attempted nasendoscopy assessments were successful in viewing the TEF site. In those with anatomic changes, such as esophageal stricture, caution should be taken, but the procedure may still be attempted and can be successful. The tolerance of nasendoscopy in this study was high and in some cases was improved by the use of a local anesthetic and decongestant spray. Specific techniques (such as the patient swallowing water or voicing) enabled easier passage of the nasendoscopy down to the level of the prosthesis. The local anesthetic spray was deemed to have been helpful by the patients in this study, but as it is administered routinely with all ENT examinations, they may well have just assumed that its use was helpful and requested it be used. Comparison of the questionnaire showed that the episodes in which anesthetic spray was not used were actually rated more comfortable than those in which it was used. This was comparable with the findings of Leder et al,9 who found that the use of an anesthetic or vasoconstrictor spray provided no additional comfort over a placebo spray. As even the placebo spray was found to give some benefit when compared with the use of no spray at all, this may again relate to the patient’s prior experience of having a spray administered routinely prior to examination.

Laryngectomy patients are anecdotally found to tolerate nasendoscopy better than the general patient population; this may be because they have undergone extensive surgery to the laryngeal and pharyngeal areas, potentially making their sensation and gag reflex in this area less strong.

The findings from this research will lead to revision of the protocol for laryngectomee assessment at the local center. In the future when patients attend for review, they will be encouraged to trial nasendoscopy without anesthetic use first, with the knowledge that if they find it uncomfortable, the spray can be administered on the next attempt.

It was interesting to note that performing nasendoscopy at the clinical reviews did not significantly add to the length of the appointments and could be performed in clinical rooms with the use of the mobile equipment. Assessment also could

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Table 2. Questionnaire Analysis: Explanation for Delayed Access to SVR Review

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<tbody>
<tr>
<td>A001</td>
<td>Leaking (E)</td>
<td>3-7 d</td>
<td>Managing by cleaning valve myself, eventually sought guidance and help</td>
</tr>
<tr>
<td>A003</td>
<td>Loss of voice, tissue around valve (E)</td>
<td>3-7 d</td>
<td>It was Friday when voice became more problematic; Saturday noticed swelling around valve; Sunday voicing poor or nonexistent; at 9 AM Monday, made appointment for 11:15 same day</td>
</tr>
<tr>
<td>A005</td>
<td>Damaged valve (E)</td>
<td>3-7 d</td>
<td>No explanation given</td>
</tr>
<tr>
<td>A006</td>
<td>Valve came out (E)</td>
<td>3-7 d</td>
<td>Came to ward; catheter placed; OOH service unable to place new valve; Came to see SLT when opened on Monday morning</td>
</tr>
<tr>
<td>A008</td>
<td>Leaking (E)</td>
<td>More than 2 wk</td>
<td>The valve has leaked intermittently from day after insertion; leakage has normally been slight and remedied by brush cleaning; however, in the past 2 d has become worse; rang for appointment today, booked in for PH.</td>
</tr>
<tr>
<td>A009</td>
<td>Increased frequency of changes (R)</td>
<td>More than 2 wk</td>
<td>Managing independently at home; SLT requested review to see if reason for increased frequency of changes</td>
</tr>
<tr>
<td>A011</td>
<td>Monitoring tissue at esophageal end of valve (R)</td>
<td>1-2 wk</td>
<td>This was a follow-up visit to recheck the tissue around the valve</td>
</tr>
<tr>
<td>A016</td>
<td>Routine check-up; monitoring upsize of valve (R)</td>
<td>More than a month</td>
<td>Managing previous embedding of valve into tissue by up sizing valve; no concerns</td>
</tr>
<tr>
<td>A017</td>
<td>Leaking (E)</td>
<td>3-7 d</td>
<td>Not sure if was leaking or not so did not ring in straight away</td>
</tr>
<tr>
<td>A020</td>
<td>Leaking (E)</td>
<td>3-7 d</td>
<td>Intermittent then increased yesterday; knew a problem so rang for appointment</td>
</tr>
<tr>
<td>A021</td>
<td>Gagging (E)</td>
<td>3-7 d</td>
<td>Weekend, came to see ENT on call but problem not rectified; SLT review on Monday morning</td>
</tr>
<tr>
<td>A022</td>
<td>Leaking valve (E)</td>
<td>More than 2 wk</td>
<td>I waited for an appointment because sometimes it rights itself; I find crisps, peanuts, etc. get caught behind the valve and release themselves after a time; I personally feel looking into the camera it can see and find foreign bodies that should not be there</td>
</tr>
<tr>
<td>A023</td>
<td>Leaking (E)</td>
<td>More than 2 wk</td>
<td>Only intermittent to begin with and managed by cleaning, then was away on holiday; since returning from holiday, leaking got worse, so rang for appointment today</td>
</tr>
<tr>
<td>A038</td>
<td>Tissue noticed on scope (E)</td>
<td>3-7 d</td>
<td>Booked in for review by SLT; told to bring forward if any problems noticed before then, but no concerns</td>
</tr>
<tr>
<td>A041</td>
<td>Leaking (E)</td>
<td>3-7 d</td>
<td>Weekend; happy to wait as leaking intermittent</td>
</tr>
</tbody>
</table>

Abbreviations: OOH, out of hours; SLT, speech and language therapist; SVR, surgical voice restoration.
gain a greater sample size and to maximize the information found in these developing trends.

Comparability was found between the clinical assessment and nasendoscopy findings, but the addition of nasendoscopy succeeded in providing a more thorough picture of TEP and TEF difficulties. The combination of both assessments—drawing upon the clinician’s skills and clinical knowledge along with the objective nasendoscopy assessment—should be encouraged at each laryngectomy review to enhance the quality of care.

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Author Contributions
Sarah Pilsworth, chief investigator and author.

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Supplemental Material
Additional supporting information may be found at http://oto.sagepub.com/content/by/supplemental-data

References