

Post-laryngectomy Speech Rehabilitation in Southern Africa:

Challenges and solutions

Introduction

Tracheoesophageal speech is currently the best method of alaryngeal communication. A successful speech outcome requires a consolidated team approach. Surgical Prosthetic Voice Restoration has been our preferred treatment for speech rehabilitation since 1993. Over the past five years, 162 laryngectomies were performed in the Otolaryngology Unit at Groote Schuur Hospital in Cape Town (almost all had a primary Tracheoesophageal 'Puncture') predominantly for T3 and T4 cancers of the larynx and hypopharynx, but also for post-radiation recurrence, and occasionally in combination with total glossectomy. As Blom has stated, "successful treatment cannot be measured by survival rate alone".¹ Effective restoration of voice and speech is essential to psychological well-being and positive social adjustment. Oesophageal speech has had a history of limited success, often takes a long time to learn and is labour intensive. In our country, the use of the electro-larynx has never been a viable option due to the extremely high cost.

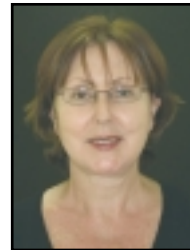
The average African lives on less than the European Economic Community's agricultural subsidy per head of cattle. Groote Schuur Hospital in Cape Town serves predominantly a lower socioeconomic population with a catchment area extending 800km from Cape Town. Many of our patients live at or below the breadline, are illiterate and unemployed, live in unserviced shacks in informal settlements (Fig 1) or low-income homes, and travel great distances to obtain specialist medical services. Some do not speak the language of the health professionals. All these factors create special challenges for speech rehabilitation of our laryngectomees.

Speech rehabilitation program

Our speech rehabilitation program comprises pre-operative speech counselling (family members are encouraged to attend), Primary Tracheoesophageal Puncture and Pharyngoesophageal Myotomy. Open-tract Voicing is attempted about 10 days post surgery once the patient is drinking and eating. If fluent voice is demonstrated, the speech therapist sizes, selects and inserts a voice prosthesis, followed by short-term intensive speech therapy with a focus on maintenance and use of the prosthesis. Patients are encouraged to return should any complications arise.

Surgical technique

Following laryngectomy, a Pharyngeal Myotomy is done down to the level of the Tracheoesophageal Puncture. We do not do a Pharyngeal Neurectomy. A Tracheoesophageal Puncture is done 1cm below the tracheal margin. A size 12 Foley catheter is inserted into the puncture, and serves both as a stent and as a feeding tube. The pharynx is closed in a horizontal or T-shaped configuration in order to maximise the capacity of the pharyngo-esophageal segment. Should the residual mucosa be insufficient, the pharynx is augmented with a pectoralis major flap.



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Selection criteria for tracheoesophageal speech

Tracheoesophageal speech outcome is always unpredictable. Our experience concurs with that of other studies that have shown that there is no single psychosocial factor that predicts successful speech rehabilitation.^{2,3} We previously reported that factors such as whether a patient lives in a shack, is illiterate, is unemployed, or lives hundreds of kilometres from the hospital, should not disqualify him/her from the opportunity of fistula speech.³ Consequently all patients who undergo laryngectomy that have adequate manual dexterity and are mentally alert, regardless of social and educational status and proximity to specialist care, are afforded a trial of primary tracheoesophageal speech.

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Fig 1: Informal settlement in Cape Town.

Speech Results

We previously reported that 81% of our patients, followed up for four to 38 months, acquired fluent, intelligible speech, used habitually as a primary means of communication.³ This means that the results in a Developing World Community such as ours equate those in the Developed World. We attribute this favourable outcome to attention to surgical detail and a committed speech therapy service.

Challenges and solutions

Severe budgetary constraints impact on the purchase and supply of voice prostheses. This is our approach to some of the problems we encounter in a Third World setting.

Choice of prosthesis

Our choice of prosthesis has been determined principally by budgetary constraints. We use removable Duckbill and Low-pressure Blom-Singer prostheses. Despite the benefits of indwelling prostheses such as reduced extrusion, the cost of indwelling prostheses has precluded its routine use. Consequently we reserve indwelling prostheses for the elderly or for those that live far from specialist services.

Valve extrusion and tract closure

In the past, our speech failures were attributable primarily to valve extrusion, failure to successfully re-insert the prosthesis timeously, and hence tract closure. Therefore, our current practice, prior to initial prosthesis placement, is to teach the patient to manipulate and insert a Foley

catheter into the fistula tract to maintain patency of the fistula should the prosthesis become dislodged. This is an easier and less traumatic practice than trying to reinsert the valve (since the gel-gap insertion system is not available to the patient), and is preferred by many that opt for prosthesis reinsertion by the speech therapist. Independent valve placement is taught only once the tract is stable, the 'puncture' is well visualized and easily accessible, and the patient's level of confidence has increased. In addition, removable prostheses are employed as 'indwelling' prostheses – the prosthesis is cleaned in situ with a cytobrush, and is removed only when it malfunctions. These practices have greatly reduced the rate of closure of the fistula tract and need for secondary Tracheoesophageal Puncture.

Device life and leakage

Our experience with approximately 700 prostheses over the past five years has demonstrated an average device life of four months for removable prostheses (range 1-18 months), and an average of seven months for indwelling valves (range 3-15 months). Due to the limited supply of new prostheses, leaking valves in indigent patients are not replaced before a four month (removable type) or seven month (indwelling type) period has elapsed. The valve insertion stick is employed as a 'plug' to prevent leakage when drinking fluids (Fig 2). This is considered a minor inconvenience by the patient, since he/she continues to speak and usually eat well. We have also devised other plugs at a minimal

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Fig 2: Plug to prevent leakage.

cost. Extending the device life by use of the plug reduces the personal costs of transport to the hospital, attendance billing and cost of a new prosthesis. Premature leakage is mostly attributable to presence of *Candida*. Antifungal Prophylaxis is however seldom employed because of the expense; however, patients are encouraged to eat natural antifungals such as yogurt, buttermilk and garlic.

Tracheal crusting and lack of humidification

Patients are very susceptible to crusting in our hot, dry climate. Patients are encouraged to wear stoma covers at all times and to keep them moist to promote humidification. The imported laryngectomy protectors are extremely costly. A sheltered employment work centre was approached and now sews stoma covers for the hospital at a nominal cost. The fabric is cheap, eyelet polyester cotton, doubled to avoid retraction into the stoma during inspiration and is washable. The total cost per stoma cover is approximately 10 pence! Crusting is usually adequately managed by steam inhalations with apple cider vinegar (if available), followed by inhalation of 1ml of lukewarm water.

Post-operative radiotherapy

Many of our patients require post-operative Radiotherapy. This does not preclude primary Tracheoesophageal Puncture and placement of voice prosthesis. The prosthesis is fitted and patients are encouraged to speak before commencement of Radiotherapy. This has a very positive psychological effect. Voice quality may deteriorate during Radiotherapy and digital occlusion may be avoided due to skin desquamation but improvement is noted soon after completion of Radiotherapy.

Multi-lingual, cross-cultural environment

We do not consider language barriers or cultural factors to be a contra-indication to tracheoesophageal speech. The use of translators (including friends, family members and rehabilitated laryngectomees) and a sensitive, committed and insightful approach generally overcomes these perceived obstacles.

Long-term speech success and complications

At initial fitting, fluent voice is almost always achieved, but long-term fluent and intelligible speech is the true indicator of success. Both the ENT surgeons and speech therapists have an

'open-door' policy to deal with problems such as granulation tissue and valve extrusion. These complications are usually handled quite easily and successfully in the majority of cases. Patients are encouraged to visit the speech therapist whenever they attend their follow-up Oncology appointments. This provides an opportunity to socialise with other laryngectomees, increases motivation and morale, and reinforces education regarding care, maintenance and use of voice prostheses.

Speech failures

Patients are reassured of our commitment to address speech failures. Initial voice failures are assessed by Videofluoroscopy to exclude the presence of pharyngoesophageal segment stricture or spasm. A 'pharyngeal bar' or spasm is addressed by a Secondary Pharyngeal Myotomy, at least three months following Radiotherapy or surgery. Over the past five years, 8/13 speech failures had a Secondary Pharyngeal Myotomy with subsequent successful speech outcome. The remaining five failed to return for follow-up.

Personal resource kit

On discharge from hospital, every patient is equipped with a 'survival kit' (aptly named by one laryngectomee). It contains five stoma covers, a pocket-size mirror, a Foley catheter corresponding to the size of the fistula and a 5ml syringe to inflate the bulb, an insertion stick or other plug, three cytobrushes, educational diagrams and the name and contact telephone number of the speech therapist. An application form for a 'Medic Alert' bracelet is submitted (Laryngectomy – neck breather). All of this is supplied free of charge to indigent patients. This practice facilitates good prosthetic management and social acceptance.

In conclusion

Regardless of poverty, lack of adequate housing, sanitation, and electricity, great distances from the hospital, language and cultural barriers, and poor education, all laryngectomees deserve to be given the opportunity to acquire tracheoesophageal speech. By following standard surgical technique, and with a dedicated speech therapy service, wonderful results can be achieved, and laryngectomees can be given the opportunity to participate fully in society.

References

1. Blom ED. *Current status of voice restoration following total laryngectomy*. *Oncology (Huntingt)* 2000;14(6):915-22.
2. Lentin R, Williams G, Sellars SL. *Postlaryngectomy voice restoration – a two year review*. *S Afr J Surg* 1995;33(4):183-5.
3. Fagan JJ, Lentin R, Oyarzabal MF, Iaacs S, Sellars SL. *Tracheo-oesophageal speech in a Developing World Community*. *Arch Otolaryngol* 2002;128(1):50-53.

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