VOICE PROSTHESIS - OUR EXPERIENCE

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Abstract: Malignancy of the larynx is a large group of malignancies in our country. The advanced stage of laryngeal carcinoma requires total laryngectomy which results in loss of speech along with other psychological and functional damages. Following total laryngectomy, tracheo-oesophageal voice prosthesis offers the most reliable form of voice rehabilitation. At S.M.S. Medical College and Hospital, Jaipur 25 patient underwent speech rehabilitation with voice prosthesis between Dec. 2001 to Dec. 2003. Speech rehabilitation was successful in all patients with few problem associated with indwelling prosthesis.

Keywords: Provox voice prosthesis, speech rehabilitation, tracheo-Oesophageal puncture

INTRODUCTION

Total laryngectomy profoundly alters voice, respiration and to varying degree deglutition, but inability to speak usually imposes the most significant problem. Voice restoration using a tracheo-oesophageal puncture has become the current treatment of choice for post laryngectomy speech rehabilitation. Various voice prosthesis have been evolved to restore speech. Currently the most commonly used type of voice prosthesis (V.P) are Blom Singer (B.S.) and Provox (Px).

The indwelling B.S.V.P. is a variant of the initial B.S. prosthesis that was developed by Blom and Singer in 1979. The PxVP was developed by Hilgres and Schouweberg in 1990. Both prostheses are inserted differently. The B.S. is inserted antegrade into the tracheo-oesophageal puncture by a gelcap system. Provox-1 is inserted retrograde from the oropharynx in the tracheo-oesophageal fistula by a guide wire while Px₂ can be inserted antegrade with the help of applicator.

All patients who underwent total laryngectomy or laryngectomy combined with partial pharyngectomy from Dec 2001 to Dec 2003 are included. Tracheo-oesophageal puncture was performed at the time of laryngectomy in the primary placement group, since this has become the standard voice rehabilitation technique. In addition all sec. prosthesis placement during that period are also included.

A total of 29 prosthesis were placed in 25 patients at the department of Otolaryngology. Head and Neck surgery, SMS Medical College, Jaipur Rajasthan. Placements were randomly assigned to Blom Singer and Provox. Overall assessment of V.P. was based on the patient's subjective assessment, own perception of voice quality and ease of prosthesis cleaning and management of various problems associated with prosthesis. Subgroup analysis was performed for primary versus secondary placement.

RESULTS

A total of 29 devices were placed in 25 patients, 26 devices were provox and 3 were blom singer. 6 were placed by sec. puncture and rest all were placed primarily.

All the patients after surgery were subjected to post op. Radiotherapy. Voice rehabilitation was started 2 to 3 weeks after Laryngectomy depending upon the healing and continued during Radiotherapy. Acceptable voice quality was achieved in all patients.

ASSOCIATED PROBLEMS

1. Granulation around TEP developed in one (Px patient after radiotherapy which were cauterised by AgNo₃. Patient could use the prosthesis for 1 year. After that there was leakage from the TEP which required change of prosthesis this prosthesis again lasted for 1 year and due to leakage patient required again change of Provox II.
2. One of the patient developed candidiasis around the TEP which was controlled by applying antifungal. (Illustration No. 1 - Endoscopic view)
3. Sudden loss of voice was complained by the only female patient of our series which was due to crust blocking the prosthesis and after removal of crust patient regained her voice.
4. Spontaneous extrusion were observed in 4 patients, two of them complained of loss of voice 10 to 15 days prior to expulsion of the prosthesis (probably their T.E.P. would have been healed before extrusion of the prosthesis because on examination there was no patent TEP). In these two patients spontaneous extrusion was seen after 7 and 8 months after placement of prosthesis. In 2 patient extrusion was seen after 2 years but the T.E.P. was still patent in one so Provox-II was again inserted as OPD procedure and other patient was not willing for replacement of prosthesis due to its cost.
5. One patient could not gain voice even after 6 weeks of prosthesis application due to apprehension so I.M. calmpose was given and speech therapy was tried. As result of this he started using his prosthesis probably this delay in speech was due to depression associated with laryngectomy.

DISCUSSION

TEP is a superior method of speech rehabilitation after

laryngectomy compared to other method such as electrolarygeal and oesophageal speech. Unlike other methods the possibility of producing an effective voice is reached much earlier with less voice training.⁽¹⁾

The voice quality for both type of prosthesis is over all good and comparable in both the groups. We were able to achieve good voice in all the cases as compared to earlier reports⁽³⁾. Training and speech therapy have important effect. Another important parameter in the evaluation is the life of the prosthesis. Prostheses were replaced when there was salivary leakage through the prosthesis. In this study mean life time of prosthesis is 1 year but spontaneous extrusion was seen in 4 cases after 7 & 8 months and 2 years respectively. It is better than what has been reported in the literature in smaller series⁽⁴⁾

The quality of life of V.P. is an essential part of the study when we asked our patient about the ease of maintenance. The Px is better accepted by the patients. This is due to difference in clearing management between both VPs. Bs is cleaned by flushing water through the valve. Proper insertion of the flushing pipette on the prosthesis is required to avoid aspiration into the trachea where as the Px. is maintained with a dry brush^(1,2). Another factor that should be taken into account is the anatomic configuration of the tracheostoma. If the tracheostoma is small and the fistula situated some what deeper it is easier to place a V.P. in retrograde fashion. Moreover in these cases cleaning with the brush is certainly easier. Since it can be very hard to lock the flushing pipette securely on the BSVP.

A second generation of Px (Px₂) has been developed allowing antegrade replacement as on OPD procedure. On comparing placement of Px₁ and Px₂ it is easier to use Px₁ doing pri TEP and sec TEP but Px₂ is used for changing the prosthesis as an office procedure when there is a patent TEP.

Problems associated with prosthesis

Candida Infection	1
Salivary Leakage	2
Blockage due to crust	1
Spontaneous Extrusion	4
Granulation around TEP	1

Sex distribution

No. of patients	Male	Female
25	24	1

Prosthesis Placement

Total Placement	Primary	Secondary
29	23	6

Types of Prosthesis

Provox	Blom Singer
Px1 20	Px2 6 3

CONCLUSION

Tracheo-oesophageal voice has evolved world wide as a viable option for laryngeal voice restoration following total laryngectomy. Prosthetic advances, most particularly the introduction of an indwelling style of voice prosthesis have eliminated previous contraindication to voice prosthesis placement. They can be used primarily or secondarily. With the introduction of Px₂ it has become very easy to change the prosthesis in office setup. The only factor which is limiting the use of voice prosthesis is its cost. It is very difficult for the patients of developing country like India to bear recurrent cost of the prosthesis which costs about Rs. 15,000 per placement⁽⁵⁾.

Unlike other method, the possibility of producing an effective voice is reached much earlier with less voice training. Further effort in voice rehabilitation should focus on why V.P. leakage occurs, obviating the need for frequent replacement.

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