The Effect of Initial Tracheoesophageal Voice Prosthesis Size on Postoperative Complications and Voice Outcomes

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ABSTRACT

Objectives:
The optimal initial size of tracheoesophageal voice prosthesis (TEVP) for tracheoesophageal voice restoration (TEVR) remains unclear, as large prostheses may predispose patients to a widening fistula, leakage around the prosthesis, and poor voicing. This study compares complications and voice results after primary placement of 16 and 20 French (F) prostheses.

Methods:
All cases of immediate TEVP placement at the time of tracheoesophageal puncture at a large academic medical center were retrospectively reviewed (2007-2013). Prosthesis-related complications (including dislodgement, leakage around or through the prosthesis, infection, and granulation tissue formation) were compared. Outcomes including frequency of prosthesis change, acquisition of fluent speech, and time to fluent speech were similarly compared.

Results:
Of 47 patients included, 25 received 20F prostheses and 22 received 16F. Postoperative complication rates were similar between groups, including leakage around the prosthesis (p=0.373) and aspiration pneumonia (p=0.670). After controlling for the timing of puncture in relation to time of laryngectomy, there were no significant differences in either timing of voicing or ability to achieve fluency. Patients in the 20F group underwent fewer prosthesis changes per year (3.0 vs. 5.3), with a longer time until first prosthesis change (76 vs. 43 days).

Conclusion:
Voice restoration was successfully achieved using both 16F and 20F prostheses. Prosthesis diameter was not associated with a difference in either complications or voice outcomes. Therefore, initial primary placement of a smaller diameter prosthesis can be safely and effectively undertaken with potential benefits of smaller physical presence, less trauma to the tracheal wall, and ability to upsize if necessary.

RESULTS

There were 25 patients with 20F prostheses, and 22 with 16F. All were placed successfully. Comorbidities and demographics were similar between the two groups.

Complications occurred at similar rates between groups (Table 1). Voice was achieved faster in the 16F group (Table 2), although this trend diminished when controlled for timing of tracheoesophageal puncture (at time of laryngectomy, vs. at later date). Patients in the 20F group underwent fewer prosthesis changes per year (3.0 vs. 5.3), with a longer time until first change (76 vs. 43 days).

DISCUSSION

Our cohort showed no significant difference in complications when comparing the 16F and 20F groups. Our findings corroborate the conclusions from several other studies reporting no increased risk for fistula widening and leakage from larger prostheses.

Similarly, our cohort’s voicing outcomes were similar between groups. Fluency was achieved in 92% of the 20F and 86.4% of the 16F group (p=0.543), for an aggregate 89.4% fluency during the study period. This is commensurate with published rates of 74-95%. There was a trend towards earlier voicing in the 16F group compared to the 20F group, though this trend was not apparent once timing of prosthesis placement (during laryngectomy vs. at a later date) was factored in. Timing of the prosthesis placement may also account for the difference in time to first prosthesis change between the two groups (76 days for 20F; 43 days for 16F), as 16F users were using their prostheses earlier and followed up at an earlier date. Therefore, differences in time to phonation may be more related to timing of the TEVR relative to laryngectomy than prosthesis size.

CONCLUSIONS

Complications and voicing outcomes of 16F and 20F prosthesis placement are similar. We prefer placement of a 16F prosthesis given its smaller physical presence, reduced trauma to the tracheal wall, and ability to upsize if necessary.