



Pharyngoesophageal Segment Behavior in Esophageal and Tracheoesophageal Speech: A Review of Determining Aspects of Vocal Outcome

Ana Carolina Ghirardi | carolina.ghirardi@ufsc.br
Andrey Ricardo da Silva | andrey.rs@ufsc.br

The Pharyngoesophageal Segment (PES) provides the voice source for totally laryngectomized patients. Variations in the PES' structure and mechanical properties account for the difficulty in understanding its behavior during speech, crucial in providing clinical guidelines in voice rehabilitation, predict therapeutic success and and improve overall vocal outcome. The fibers of the PES vibrate during both esophageal (ES) and tracheoesophageal speech (TES). Studies often consider PES vibration occurring in a similar manner in ES and in TES. Given that the air source for voicing is different in both types of speech, it is reasonable to assume that the PES behaves differently in ES and TES. Understanding this behavior may aid in understanding the reasons causing vocal failure even in tracheoesophageal speakers. Our **aim** is to discuss the characteristics of the PES that, according to literature, directly influence vocal quality in esophageal and tracheoesophageal speech.

Methods

Critical literature review, based on the guideline question: *“How do the shape, position, pressure, tone, number of vibrating segments and symmetry of the mucosal wave of the PES during speech influence vocal outcome in esophageal and tracheoesophageal speakers?”*

24 studies

Voice Specialists (SLP) classify subjects as “good” or “poor” speakers based on perceptual criteria

Esophageal manometry and/ or different imaging techniques were used to asses: PES shape, position, muscle tone, fiber vibration, pressure, mucosal wave

PHARYNGOESOPHAGEAL SEGMENT (PES)	ESOPHAGEAL SPEECH (ES)	TRACHEOESOPHAGEAL SPEECH (TES)
POSITION	Moves (upward) during speech	Moves (upward) during speech
SHAPE	May change with different voicing tasks but not related to vocal outcome	circular or oval shaped PES tend to yield “better” voice qualities
MUSCLE TONE	Important for voicing onset	Influences voice quality and phonation times
MUCOSAL WAVE	Symmetric waves yield less hoarse and/or breathy voice quality	Symmetric waves yield less hoarse and/or breathy voice quality
PRESSURE	Pressure at rest at the upper esophageal sphincter more important for voicing onset	Pressure distribution along the esophagus more important for voice onset/quality

Conclusions

There was little differentiation between overall speech performance and/or intelligibility and voice quality which, frequently, prevented more detailed analyses on voice.

There is need for more specific criteria in assessing vocal quality in ES and TES so that surgeons, doctors and voice clinicians can better predict vocal outcomes, manage eventual setbacks and improve overall voice quality for laryngectomized patients.

Acknowledgements

FINEP/Brazil for grant number 01.16.0044.00(0346/15) and the National Council for Scientific and Technological Development (CNPq) – Brazil.