A new proposal for evaluation of the pharyngoesophageal segment and its relation with the narrow-band spectrogram in tracheoesophageal speakers

**Purpose:** The primary purpose of this study was to assess the relationship between pharyngoesophageal segment (PES) configuration and narrow-band spectrogram of tracheoesophageal voices.

**Methods:** This study included 30 total laryngectomees tracheoesophageal speakers. Patients were assessed by videofluoroscopy (VF), during deglutition and voicing, and the vowel /a/ was recorded for spectrographic analysis. The evaluation of VF recording consisted of visual perceptual rating of degree of contact between the prominence of PES and its anterior wall, defined as absent/mild (hypo contact), moderate (normo contact) and intense (hyper contact); and quantitative measures of PES: anteroposterior distance (APD) and length of the PES (lenPES); PES surface area in swallowing (areaSw), and phonation (areaPh), and the area of the air reservoir (areaAir). Visual inspection of a narrow-band spectrogram was made and four different acoustic signal typing were defined as Type I, II, III or IV.

**Results:** Type I-II is correlated with moderate contact; Type III, with intense and Type IV, with absent/mild contact. Type I-II has bigger APD and PES with lower length than Type IV. There is a correlation between bigger APD and shorter PES.

**Conclusion:** The group with I-II signal typing has PES with normo contact; Type III with hyper contact and Type IV has PES with hypo contact. The best tracheoesophageal voices are achieved by PES with moderate contact of the prominence and with shorter and larger anteroposterior PES distances. What differentiates the PES with hyper contact from PES with normal one is only the degree of contact between the prominence of the PES and its anterior wall.

**Keywords:** Voice, Tracheoesophageal fistula, Spectrography, Acoustics, Laryngectomy/rehabilitation, Fluoroscopy/methods

**Author:**
Marina Lang Fouquet
Mara Behlau
Antônio José Gonçalves