

論文名 : New swallowing evaluation using piezoelectricity in normal individuals

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This study aimed to elucidate the relationship between the piezoelectric waveform latency, hyoid bone movement, surface electromyogram (sEMG), and the pharyngeal transit time (PTT) during swallowing. Forty-one healthy subjects were divided into three age groups: younger (20–39 years, n = 8), middle-aged (40–59 years, n = 9), and older (60–79 years, n = 24). Motion analysis of the hyoid bone using videofluorography (VF), waveform analysis of the front neck using piezoelectric films, and sEMG of the suprahyoid muscle group were performed simultaneously. Latencies of the three movement phases were defined as upward (VFS1), forward (VFS2), and returning to starting position (VFS3). The three phases of the piezoelectric waveform—from wave initiation of the negative wave to the start of the second deep negative wave; from the start of the second deep negative wave to the start of the last positive wave (SLPW); and from the SLPW to the end of the last positive wave—were defined as PS1, PS2, and PS3, respectively. VFS1-3 and PS1-3 were significantly correlated. VFS1 and PS1 latencies were significantly longer with thick liquid than with thin liquid. VFS2, PS1, and PS2 latencies were longer in the older group than in the other two groups. The start of PS1 was nearly equal to those of sEMG and VFS1. Bolus arrival time in the valleculae was statistically equal to the end of the PS1 with both thin and thick liquids. To establish the swallowing screening using Piezoelectric film, further investigation is necessary in the dysphagia patients.