INACCURACY OF FINGERBREADTH MEASUREMENTS FOR AIRWAY ASSESSMENT

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INTRODUCTION

Many references in the Anesthesia literature suggest that a thyromental distance (TMD) greater than 3 fingerbreadths (FB) or 6-6.5 cm is reassuring for intubation¹⁻⁵. The purpose of this study was to determine the accuracy of FB measurements and the average width of Anesthesiologist's fingers.

METHODS

This study was approved by our institutional ethics review board. Fifty-one Anesthesia staff and residents participated in this study (M/F=39/12). Each subject was asked "when you assess the TMD on a patient and record it as 3 of your own FB, what is that true measured distance". The width of cumulative FB (1 FB = index, 2 FB = index+middle, 3 FB = index+middle+ring, 4 FB = index+middle+ring+little) was measured to the nearest millimeter on the dominant hand using a vernier caliper (resolution 0.05 mm). Measurements were taken perpendicular to the fingers at the DIP joint level. Reproducibility was evaluated by repeating caliper measurements on 10 subjects at a separate occasion.

RESULTS

The absolute error between the reported 3 FB width and measured 3 FB was 8.8 ± 5.8 mm (16.4%) and 8.1 ± 5.7 mm (17.1%) for males and females respectively (NS, $p = 0.71$). Significant differences were observed between male and female finger widths (Table 1, mean fingerbreadths ± 1 sd, ANOVA, M vs. F, $*p < 0.0001$). Test-retest analysis of caliper measurements demonstrated a mean bias of 0.4 mm and a maximal single measurement error of 4 mm.

Table 1	1 FB (mm)	2 FB (mm)	3 FB (mm)	4 FB (mm)
Male	17.9 ± 1.1 *	36.5 ± 2.2 *	55.2 ± 3.1 *	75.2 ± 3.9 *
Female	15.3 ± 1.0	31.3 ± 1.9	47.8 ± 1.7	65.1 ± 2.5

DISCUSSION

There was often a large error in anesthesiologist's perception of what their 3 FB was equal to in comparison to the true measured width. This study demonstrates significant gender differences in FB and that 3 FB is not equivalent to 6-6.5 cm for most Anesthesiologists. Although no single bedside test predicts difficult laryngoscopy, this study demonstrates the variability and inaccuracy associated with fingerbreadths as an airway assessment tool.

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