

Effect of open- versus closed-glottis pushing on levator hiatal dimensions in nulliparous women before labor

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Objectives

To compare levator hiatal dimensions during pushing with open vs. closed glottis in nulliparous women before labor.

Methods

95 Nulliparous women with singleton cephalic pregnancies between 35 and 41 weeks' gestation were recruited. Four-dimensional transperineal ultrasound volumes were acquired during maternal pushing using both open- and closed-glottis techniques, performed in alternating order. Levator hiatal dimensions were measured at rest and during pushing. Changes from rest to pushing and coactivation rates were compared between the two techniques and between the first and second pushing attempts.

Results

Changes in anteroposterior diameter (APD) and levator hiatal area (LHA) were similar between techniques, whereas the increase in transverse diameter (TD) was greater during closed-glottis pushing ($p=0.011$). Coactivation rates were similar with open- and closed-glottis pushing (11.6% vs. 10.5%). The second pushing attempt was associated with greater increases in APD ($p=0.021$) and LHA ($p=0.012$) compared with the first attempt.

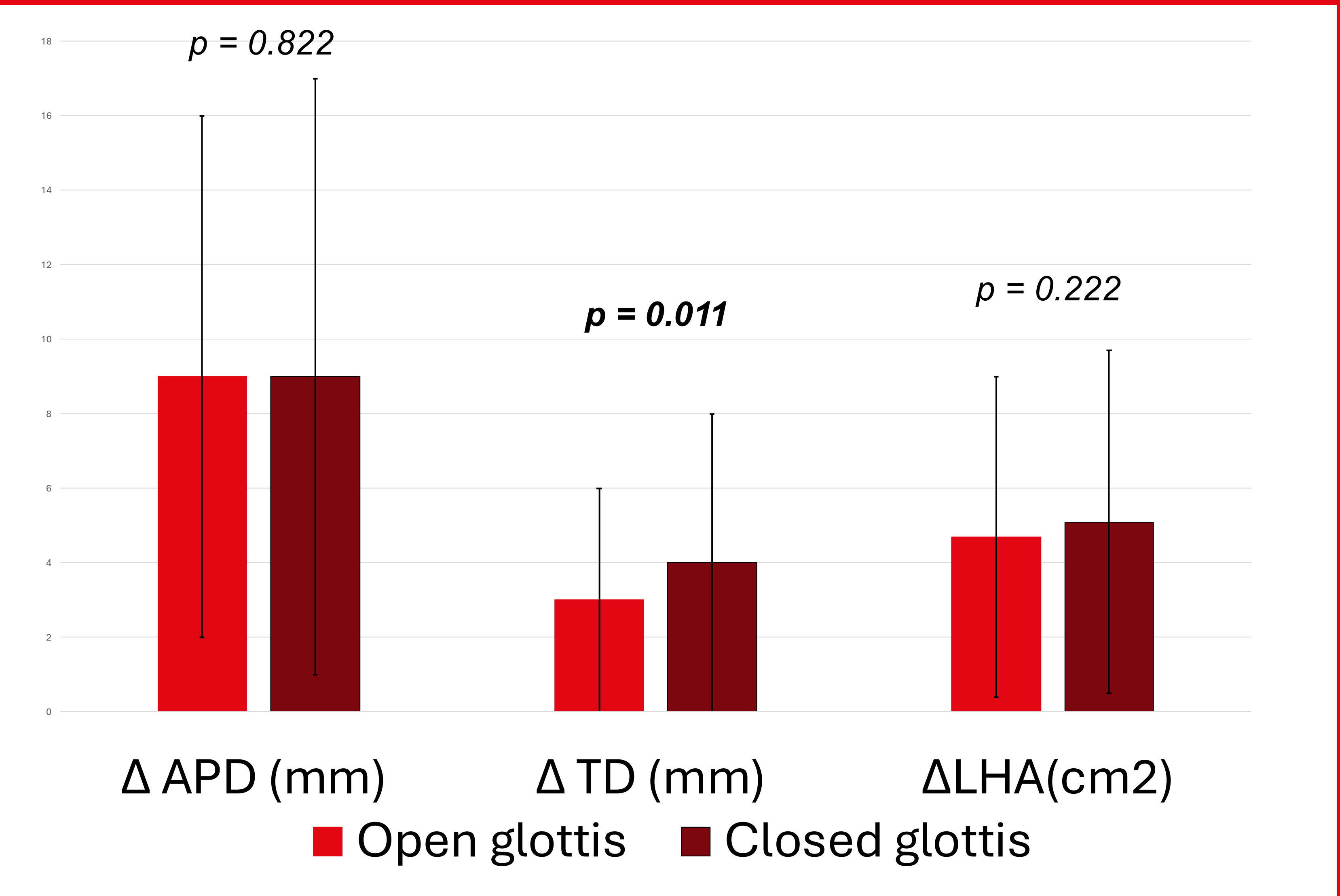
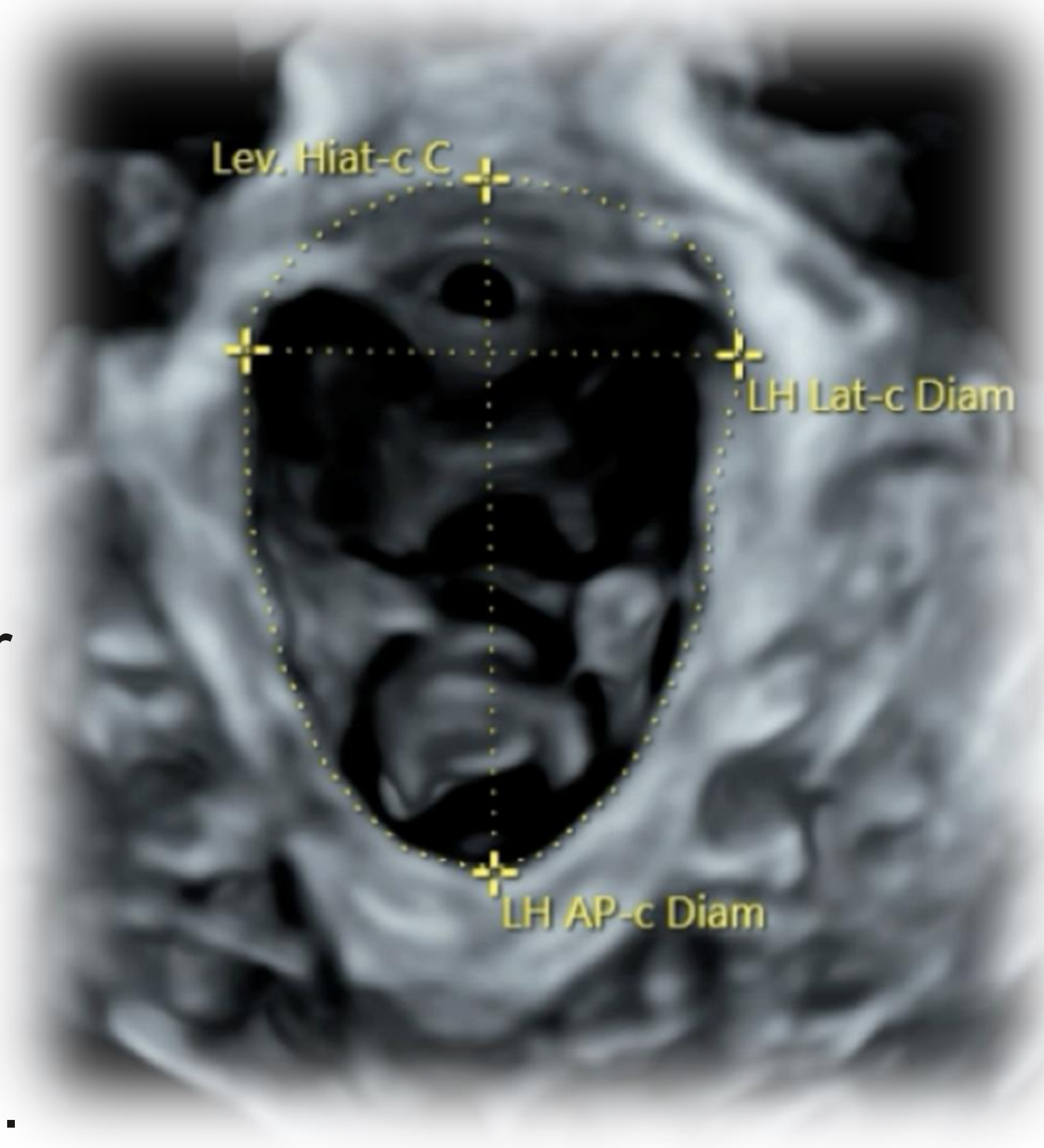


Figure 1. Changes in levator hiatal dimensions during open- and closed-glottis pushing.

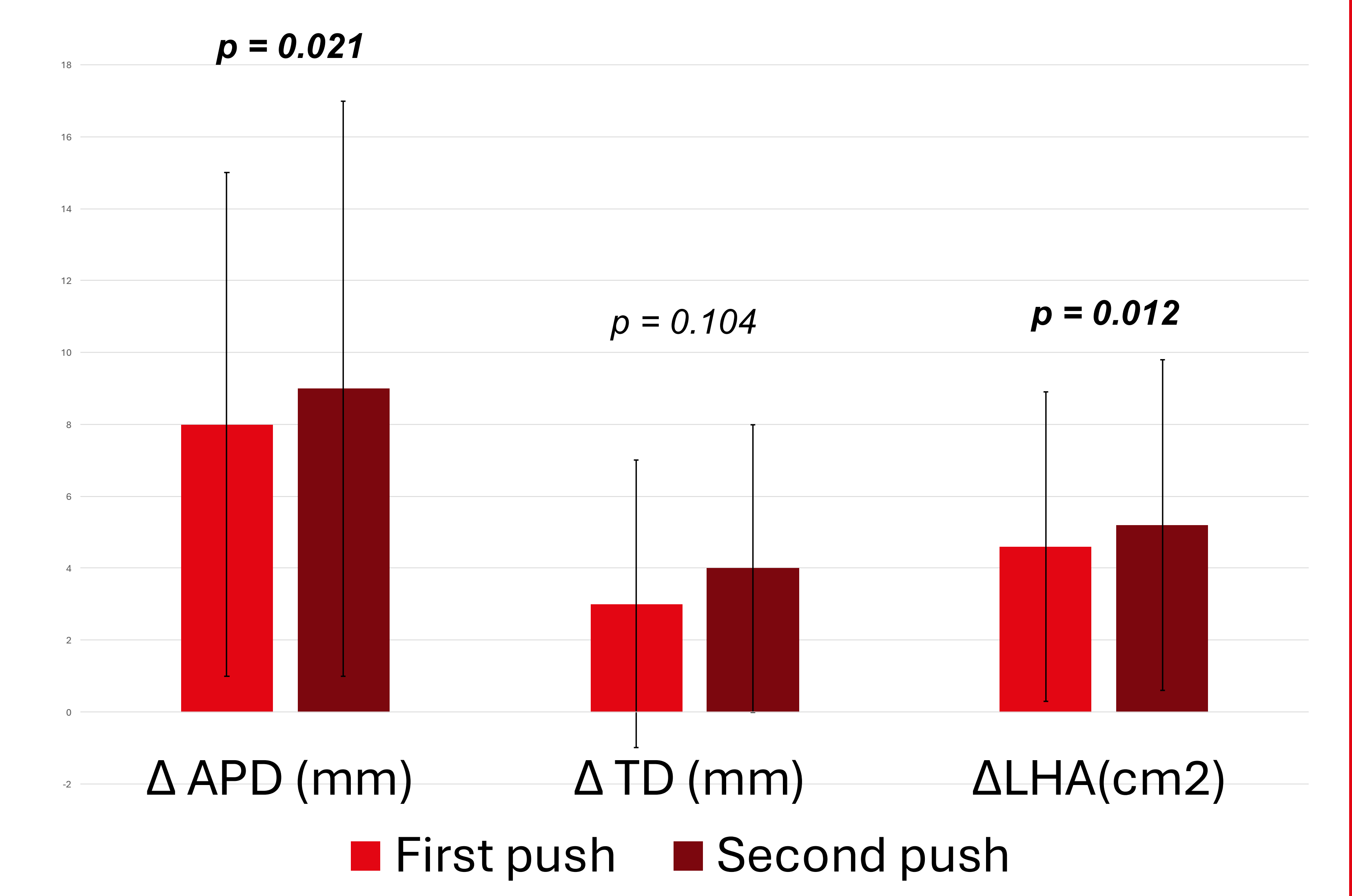


Figure 2. Changes in levator hiatal dimensions during the first and second pushing attempts.

Conclusion

Before labor, open- and closed-glottis pushing resulted in similar changes in levator hiatal dimensions, except for a greater increase in transverse diameter during closed-glottis pushing. After visual feedback training, levator ani coactivation was uncommon with both techniques. The second pushing attempt was associated with greater increases in levator hiatal dimensions, regardless of pushing technique.