

Study No. 3: Reflex contraction of the levator plate increases intra-anal pressure, validating its role in continence

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Abstract: Activation of the “vagino-levator reflex” by digital stretching of the vagina, increased intra-anal pressure less in patients with fecal incontinence than those without. This experiment demonstrates that the levator plate has a key role in the fecal continence mechanism.

Key words: Levator plate; Fecal incontinence; Intraanal pressure; Integral theory.

INTRODUCTION

The Musculo-Elastic Theory defines an important role for the levator plate in anorectal closure. The radiological study demonstrated backward movement of the organs on straining. Though this backward movement can only be explained by contraction of the posterior pelvic muscles, this movement may not necessarily be a factor in anorectal closure. The aim of this study was to more precisely define the role of the levator plate (LP) in anorectal closure by measuring the pressure in the anal canal following digital stretching of the distal vagina. The basis for this test was the “vagino-levator reflex” which was previously described by Shafik.¹ Stretching the vagina causes a reflex contraction of the levator plate muscles. As the levator plate is attached to the posterior wall of the rectum, any reflex contraction of the levator muscle should also increase the intra-anal pressure. Furthermore, if this hypothesis were valid, a smaller intra-anal pressure rise would be expected in patients with fecal incontinence, than in those without.

METHODS

Ten women with FI and 10 normal women, matched for age (mean ages 65 and 61.5 yrs), menopause and hormonal status were studied. Two fingers were placed against the anterior wall of vagina at the level of midurethra, and gently stretched upwards towards the pubic bone. Shielded Gaeltec microtransducers placed in the anal canal 3 cm distal from the external anal orifice measured the intra-anal pressure before and after stretching.

RESULTS

This action caused a mean increase in endoanal pressure of 47cm water in the control group, and a mean 30 cm water pressure increase in the FI group. These differences in the

two groups were significant (Student's t test, $p = 0.034$), suggesting less tight anal closure by the directional muscle forces in the FI group.

DISCUSSION

Reflex rise in endoanal pressure following vaginal wall stretching in both the FI and control groups confirms the role of levator plate in anorectal closure, according to the theory. The lower pressure rise in the FI group is consistent with a deficiency in anorectal closure force caused by a weakened muscle contraction. As well as stimulating the “vagino-levator reflex”, pressure at the midurethral point should have caused an equivalent rise in pressure in both groups if the pubourethral ligament was the sole determinant of the incontinence.

The data indicate that a lax pubourethral ligament cannot be the sole determinant of FI.

CONCLUSION

Levator plate action during anorectal closure was confirmed. Other structures besides a firm pubourethral ligament may have an active role in anorectal closure.

REFERENCES

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