

Experimental Study No. 2: A direct test for the role of the pubourethral ligament in anorectal closure

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Abstract: Midurethral anchoring controlled solid feces loss during coughing in a patient with a history of stress fecal and urinary incontinence. This experiment demonstrated the importance of an intact pubourethral ligament when both conditions occur simultaneously.

Key words: Stress fecal incontinence; 'Simulated operation'; Pubourethral ligament; Integral theory.

INTRODUCTION

The series of video X-ray photographs (Study No. 1), appeared to support the Theory's prediction of a major role for the pubourethral ligaments in the control of fecal incontinence. A serendipitous presentation of a patient with a history of stress induced fecal incontinence at Royal Perth Hospital Outpatients Gynaecology Clinic allowed this part of the Theory to be tested directly.

METHODS AND RESULTS

A 54 year old patient, para 3, presented with a long history of leaking solid feces on coughing or straining. She discharged a bolus of feces on being asked to cough. This was replaced in her anus, and a sponge-holding forceps was gently pushed upwards onto the vaginal wall, on one side, at the level of the middle part of the urethra ('simulated operation'). Leakage of solid feces during coughing and strain-

ing was controlled immediately. On removing the forceps, leakage was noted again on straining. This procedure was repeated several times, and the same results reproduced on each occasion. Subsequently the patient had a midurethral sling operation, and reported total cure of this problem.

DISCUSSION

Robert Zacharin¹ described how the pubourethral ligament inserts into midurethra and the anterior portion of m.pubococcygeus, (PCM, Fig. 1). Both PCMs sweep backwards to form the levator plate (LP), Fig. 1; the levator plate 'LP' is attached to the posterior wall of rectum² by fascia which it tensions and stretches backwards. The levator plate has to be well-tensioned before the longitudinal muscle of the anus (LMA) can pull down its anterior border to effect anorectal closure around a firmly contracted puborectalis muscle (PRM) (see X-ray study, this issue). A lax pubourethral ligament (PUL), would not allow LP to contract sufficiently for LMA to rotate it around PRM for closure. A forceps applied to the site of the pubourethral ligament provides the firm anchoring point needed to restore the maximum contraction required for anorectal closure.

CONCLUSION

Only the Integral Theory's hypothesis, that the pubourethral ligament has an important role in continence control, can explain this observed sequence of events.

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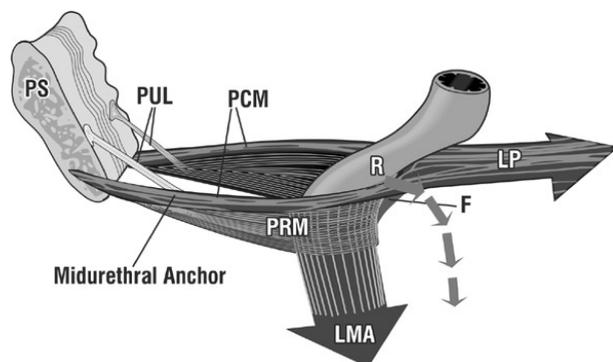


Fig. 1. – Mechanism for restoration of continence with midurethral anchoring. Puborectalis (PRM) stretches the posterior anorectal wall forwards. The pubourethral ligaments (PUL) anchor pubococcygeus muscles (PCM) which fuse posteriorly to form LP (levator plate). PUL laxity will weaken the ability of LP to contract and be tensioned. LP tensioning is a pre-requisite for backward stretching of the rectum (R), and downward rotation around PRM by the longitudinal muscle of the anus (LMA). The small arrows represent the LP/LMA rotational vectors. It is this rotation which assists anorectal closure and forms the anorectal angle. F = fascial attachment of LP to rectal wall.