

Where is the bladder neck following needle suspension operations?

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Summary: Bladder neck suspension operations are commonly performed for stress incontinence. Cure is achieved by increasing proximal urethral pressure by repositioning the bladder neck in a supported retropubic position. A prospective study of 25 consecutive cases assessed the position of the bladder neck radiologically pre- and postoperatively and correlated this with the symptomatic cure or failure of surgery. The final position of the bladder neck relative to the inferior border of the symphysis pubis showed *no* correlation with the symptomatic outcome.

Three cases of "failed" surgery showed *greater* elevation of the bladder neck than that achieved in women enjoying symptomatic cure, suggesting that the absolute amount of elevation achieved may not be of paramount importance. This report suggests that continence after surgery is not solely related to the anatomical position of the bladder neck relative to the sacral plane, but is more likely due to increased proximal urethral pressure during stress.

Key words: Urinary Stress Incontinence; Surgical cure; Bladder neck suspension operations; Elevation of bladder neck.

INTRODUCTION

More than one hundred operations have been described for the management of genuine stress incontinence in women (¹). Although a variety of techniques have been described (²⁻⁶) many workers consider needle suspension of the bladder neck the procedure of choice with an acceptable cure rate at review five years postopera-

tively (⁷⁻¹²). Pereyra described bladder neck elevation more than thirty years ago and in recent years variations of his technique have become popular (¹³).

Recently workers discussed the mechanism of continence after surgery (^{6, 9, 14}) and findings of pre- and postoperative urodynamic assessment of patients have been presented (¹⁵⁻¹⁹). Evidence suggests continence after surgery is due to increased proximal urethral pressure transmission, accomplished by repositioning the bladder neck in a supported retropubic position. Although pre- and postoperative urodynamic studies confirm increased proximal urethral pressures in successful cases, work has yet to show that "repositioning" the proximal urethra and bladder neck in a high retropubic position is essential for symptomatic cure.

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In an important study Stamey performed pre- and postoperative lateral view cystograms which showed that after operation there was substantial upward and forward elevation of the urethrovessical junction. In his 3 cases of operative failure the final position of the bladder neck was *higher* relative to the pubosacral plane than in 41 successful cases. Although the importance of a lateral view cystogram was emphasised in that report, later work suggested that preoperative lateral chain cystograms are not required in uncomplicated cases.

Asymptomatic women may have the resting position of the bladder neck below the lower symphysis pubis border ⁽²⁰⁾ and women with stress incontinence may have a urethrovessical junction positioned well above that point ⁽²¹⁾.

Consequently attention has focussed on the position and movement of the bladder neck in both continent and incontinent women ^(20, 22, 23).

Previous workers postulated that failure of the pubocervical and endopelvic fascia to support the bladder neck upward and forward, resulted in operative failures ⁽⁹⁾.

This report suggests that continence after surgery is not solely related to the anatomical position of the bladder neck relative to the pubosacral plane, but is due to increased proximal urethral pressure during stress.

SUBJECTS AND METHODS

Bladder neck suspension procedures were performed for genuine stress incontinence after assessment at the urodynamics unit, using a modified Pereyra technique ⁽²⁴⁾. Women were reviewed six months after surgery and in this prospective study of 25 consecutive cases, urodynamic evaluation included radiographic imaging which was repeated at the six monthly visit. Two lateral films of the contrast-filled bladder were taken with the patient erect whilst at rest, and then straining. Radiology was scheduled so as to avoid exposure of fertile women to radiation during the luteal phase of their cycle.

Ages of patients ranged from 35 to 74 years, with a mean of 51 years. Age, success rates, length of hospitalization and other parameters of this cohort of 25 women matched those of cases not in the study who underwent evaluation and treatment by the Urodynamics Service.

Women were classified as "cured" (no leakage on coughing) "improved" (no more than a few drops when coughing with a full bladder whilst erect) or "failed" (urinary leakage demonstrated). The position of the bladder neck relative to the inferior border of the symphysis pubis pre- and postoperatively was compared with the outcome of surgery.

Subjects were reviewed at 6 months then annually after operation. There were no exclusions from the study group.

Results were analysed using the Student's "t" test.

Ethical approval for the study was obtained from the University of Cape Town Ethics Committee, and informed consent obtained from all participants.

RESULTS

Table 1 summarises the findings and results in the 25 patients. Eighteen (72%) were cured, four (16%) were improved and 3 cases (12%) were considered failures. Two of the three "failures" had had previous procedures elsewhere and have subsequently undergone successful reoperations.

Table 1 shows that elevation of the urethrovessical junction as a result of sur-

Table 1. — Summary of results *n.* = 25.

	Position of bladder neck below symphysis during staining		Bladder neck elevation achieved
	Post-Op.	Pre-Op.	
Patients cured <i>n</i> = 18	38 mm	23 mm	15 mm*
(range)	(32, 46)	(18, 29)	
Patients improved <i>n</i> = 4	48 mm	43 mm	5 mm*
(range)	(35, 54)	(30, 55)	
Failed surgery <i>n</i> = 3	43 mm	22 mm	21 mm*
(range)	(31, 48)	(14, 35)	

* Not significant, Student's *t* - test.

gery in the 3 cases that failed was *greater* than that achieved in the 18 women who were cured.

Patients in this study were followed-up for a mean of 32 months (range 16-40 months) and all failed cases were apparent by their six-month follow-up visit.

DISCUSSION

The pathophysiology of stress incontinence has been debated ⁽²⁵⁾ and the mechanism of continence proposed ⁽³⁾. Pre- and postoperative urodynamic assessment suggests an increase in proximal urethral pressure as an important factor ^(15, 17, 19).

Elevation of the bladder neck to replace the urethrovessical junction in a high retropubic position remains the goal of surgical management. One would anticipate surgical failures having a poorly supported bladder neck with recurrent prolapse and women enjoying symptomatic improvement having the urethrovessical junction in a well-supported retropubic position. Our assessment is that some women when seen postoperatively have descent of the bladder neck but are nevertheless cured of their stress incontinence. Conversely, cases of surgical failure may exhibit a well-supported bladder neck with "funnelling" of the proximal urethra or bladder neck. The two women with "failed" surgery had funnelling of the bladder neck which was subsequently successfully corrected. Follow-up radiology demonstrated well-supported proximal urethrae, in both cases 22 mm above the pre-operative position.

These data confirm that symptomatic outcome is independent of the degree of elevation achieved, or the final position of the bladder neck. The successful operation increases the proximal urethral pressure sufficiently beyond the intravesical pressure during stress ^(19, 26). Operative failure is probably a failure of this mechanism with urethral funnelling or the creation of a "frozen urethra" ⁽³⁾

rather than due to recurring prolapse of the bladder neck. In a paper published in 1978, Stanton and co-workers examined clinical and urodynamic features of failed incontinence surgery ⁽²⁷⁾, but did not address the issue of the position of the bladder neck postoperatively. Their impression was that more cases of recurrent incontinence would have occurred had bladder neck elevation not been almost universally achieved. Although numbers in the present study are small, the patients with "failed" operations had *greater* elevation of the bladder neck than those enjoying a cure, a finding similar to that of Stamey in 1975.

This suggests that continence following surgery is not solely related to the position of the bladder neck relative to the sacral plane, but is more likely due to increase proximal urethral pressure during stress.

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