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VOIDING FUNCTION FOLLOWING COLPOSUSPENSION AND TVT. A COMPARISON OF PRE AND POST-OPERATIVE PRESSURE-FLOW STUDIES

Aims of Study

To compare voiding function pre and post-operatively by means of uroflowmetry and pressure-flow studies in women undergoing colposuspension and tension-free vaginal tape (TVT) procedure as a primary surgical treatment for urodynamic stress incontinence (USI). Previous studies have demonstrated lower pre-operative voiding pressures in women with USI than in asymptomatic normal controls [1,2]. There is a deficit of published data comparing the effects of contemporary surgical techniques to treat USI, on urodynamic voiding parameters.

Methods

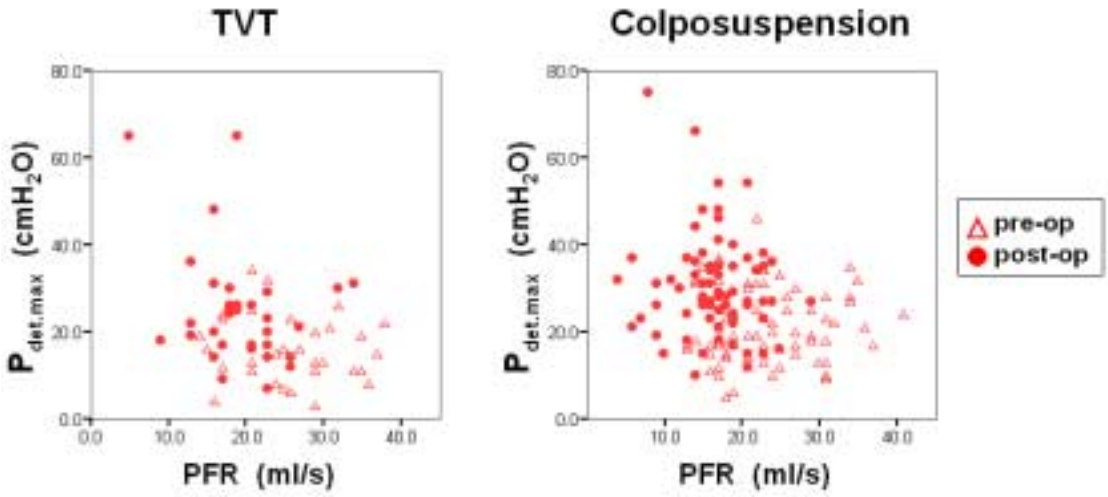
A cohort of 117 women who underwent primary surgery for urodynamic stress incontinence in a tertiary referral teaching hospital over a 3 year period, were identified. Only those women who were shown on pre-operative urodynamic assessment to have a normal capacity, stable bladder were included for analysis. 81 of these women underwent a modified Burch colposuspension using four PDS sutures on each side to achieve bladder neck elevation. 36 underwent a TVT procedure under general or regional anaesthesia for similar indications, using a standard technique. Complete pre-operative and 6-9 month post-operative urodynamic assessment records were available for 77/81 and 32/36 of these women respectively. The voiding phase was assessed by (*a*) measurement of peak flow rate (PFR) using a gravimetric flow meter. (*b*) categorisation of the uroflowmetry trace into one of 3 flow patterns: (i) a normal continuous arc-shaped curve, (ii) a prolonged, fluctuating but continuous flow pattern, (iii) intermittent 'strain pattern' voiding.(*c*) Pressure-flow studies as part of videocystourethrography, using a Laborie Aquarius 120, external pressure transducers and 4Fg fluid-filled pressure lines. The opening detrusor pressure ($P_{det,\ open}$), maximum flow rate (Q_{max}), detrusor pressure at Q_{max} ($P_{det,\ Qmax}$) and maximum voiding detrusor pressure ($P_{det,\ max}$) were analysed. Pre and post-op values were compared using the Wilcoxon signed-rank test for non-parametric data.

Results

The mean age in the colposuspension group was 57.3 with a range of 37 to 81 years. The mean age in the TVT group was 61.7 with a range of 41 to 84 years.

	Urodynamic parameter	Mean values +/- 1sd		P value *(Wilcoxon signed-rank)*
		pre-op	6-9mth post-op	
TVT (n=32)	PFR *ml/s*	24.9 +/- 6.9	19.6 +/- 6.0	0.001
	Q_{max} *ml/s*	19.0 +/- 5.1	16.5 +/- 5.3	0.045
	$P_{det,\ Qmax}$ cmH_2O	15.8 +/- 7.7	24.8 +/- 13.4	<0.001
	$P_{det,\ open}$ cmH_2O	14.2 +/- 8.1	20.4 +/- 11.7	0.003
Colpo (n=77)	PFR *ml/s*	23.1 +/- 6.5	16.9 +/- 5.0	<0.001
	Q_{max} *ml/s*	20.5 +/- 5.7	15.9 +/- 4.6	<0.001
	$P_{det,\ Qmax}$ cmH_2O	21.0 +/- 8.3	29.8 +/- 11.6	<0.001
	$P_{det,\ open}$ cmH_2O	17.5 +/- 8.6	27.5 +/- 10.5	<0.001

Graph 1: maximum voiding detrusor pressure plotted against peak flow rate for pre and post-operative urodynamic voiding assessment in patients undergoing TVT and colposuspension



Significant changes were seen following surgery in all the measured urodynamic parameters. Pressure-flow plots of $P_{det.max}$ against PFR and $P_{det,\ Qmax}$ against Q_{max} for both surgical procedures show a shift towards increased 'urethral resistance' and there was a significant alteration in the visually assessed flow patterns towards more prolonged but continuous flow. However, intermittent 'strain pattern' voiding was rare in both groups at 6-9 months post-op. When classified using published urodynamic criteria for defining obstructed voiding in women [3] (peak flow rate less than 15ml/s with a maximum voiding detrusor pressure greater than 60 cmH_2O), less than 3% of patients undergoing both procedures were categorised as 'obstructed' at 6-9 months post-op. Only two patients had significant clinical voiding dysfunction, with post void residuals consistently >100ml, requiring the use of clean intermittent self-catheterisation at 9 months post-op. Both of these women had pre-operative voiding pressures in the top quartile of the measured range, but did not show pre-operative obstruction as judged by the above criteria. Their pre-operative peak flow rates were greater than 15ml/s and maximum voiding detrusor pressures less than 40 cmH_2O.

Conclusions

The pre-operative voiding pressures in this cohort of women are consistent with those published in previous studies showing low voiding pressures in women with urodynamic stress incontinence [1,2]. Post-operative urodynamic voiding parameters show a significant increase in urethral resistance after both TVT and colposuspension, but a low incidence of urodynamically or clinically relevant obstruction. These data suggest that in the majority of women undergoing both TVT and colposuspension, the pressure-flow relationship is restored to near normal conditions rather than causing frank outflow obstruction.

References

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