

volume at first sensation of filling, cystometric capacity, detrusor pressure rise on filling or provocation for either procedure. Twelve patients (7%) in the TVT group and 13 (9%) in the colposuspension group were recorded as having DI at 6 months post-operatively which was not present pre-operatively.

Overall there was a small reduction in both free flow and catheterised flow, and a small increase in voiding pressure; this was not significantly different between procedures. Voiding difficulty was defined as 2 out of 3 of the following: peak flow <15ml/s; maximum voiding pressure >50cmH₂O; residual volume >100ml. On this basis 6 patients (7%) in each group had voiding difficulty at 6 months post-operatively (complete data on all these variables was available for only 91 patients in each group). Genuine stress incontinence was recorded during cystometry in 17 (10%) patients following TVT and 20 (15%) following colposuspension.

Urethral pressure measurements were available on 48 patients (25 TVT and 23 colposuspension). There no significant changes in resting maximum urethral closure pressure (MUCP) or functional urethral length (FUL) for either procedure. MUCP (stress) and FUL (stress) increased for both procedures; this reflects an increase in pressure transmission ratio (PTR) seen maximally in the second and third quartiles of the functional urethral length following both operations.

	TVT		Colposuspension	
	Pre-op	Post-op	Pre-op	Post-op
MUCP (rest)	45.4	39.2	45.8	48.4
FUL (rest)	30.6	29.7	30.3	32.7
MUCP (stress)	14.2	50.2	9.3	65.6
FUL (stress)	9.4	21.7	6.4	24.3
PTR Q1	86.6	98.0	89.9	106.6
PTR Q2	82.1	109.5	78.2	124.8
PTR Q3	57.0	87.4	63.9	88.6
PTR Q4	19.5	33.2	27.5	36.7

Conclusions

There is a small incidence of both detrusor instability and voiding difficulty at 6 months following both procedures; this is somewhat lower than previously reported in respect of colposuspension. Although patients experience less delay in voiding in the post-operative period following TVT, this is not reflected in subsequent urodynamic variables. The mechanism of cure following these procedures appears to be similar; neither is consistently associated with outflow obstruction. Although the surgical approach in the one case is to the bladder neck, and in the other to the mid-urethra, the enhancement in PTR is in both cases seen across the 2nd and 3rd quartiles of the functional urethral length.

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TITLE: LAPAROSCOPIC VERSUS OPEN COLPOSUSPENSION: A PROSPECTIVE MULTICENTRE RANDOMISED SINGLE-BLIND COMPARISON

Aims: Burch Colposuspension is an effective operation for the treatment of stress incontinence with long-term objective cure rates exceeding 80% (1). Laparoscopic Burch Colposuspension was described in 1990 and has gained wide popularity in recent years (2,3). With the exception of two small series the introduction of this procedure has proceeded without appropriate randomised controlled trials (4,5). The aims of this study were to evaluate the short-

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term benefits and long-term success of the Laparoscopic Burch (LB) compared to the Open Burch (OB) Colposuspension.

Methods: This study was performed at nine hospitals by six surgeons of different expertise levels. The two senior authors together performed 70 Laparoscopic Colposuspensions before commencing the study. Two-hundred consecutive women with urodynamic evidence of genuine stress incontinence and no previous history of retropubic surgery were prospectively recruited. All women were randomised to either conventional OB or LB. The surgeon was unaware of which procedure was to be performed until surgery. Abdominal wounds were dressed in theatre in an identical fashion so that both patients and ward-staff were blinded to the procedure performed until removal of dressings prior to discharge. Details including duration of surgery, intra-operative blood loss, visual assessment scores for post-operative pain, voiding difficulties and duration of stay were recorded. Urinary continence scores, symptom questionnaire, urodynamics, evaluation of urogenital prolapse and quality of life (QOL) assessment using the SF36, SUDI and SIQ were performed pre-operatively and 6 months post-operatively. Return to normal activities was assessed at the six-week follow-up visit. Subjective and objective cure rates were determined using continence scores, visual analogue scores and urodynamics. A cost analysis was performed for both the OB and LB procedures.

Results: There were 96 women in the LB and 104 in the OB groups. There were no significant differences in the preoperative demographics and the subjective and objective outcomes at six months for both the OB and LB groups were comparable (Table 1). Significant improvement in QOL was observed following both procedures at six months. There was one bladder perforation in the OB requiring blood transfusion and five in the LB group. In the LB group the perforating suture was removed and resited in three cases and the remaining two were converted to OB. In all of these cases a catheter was left *in-situ* for five days. In one LB case laceration to the obturator vein occurred and was repaired laparoscopically. There were no other significant intra-operative complications.

Table 1:

Variable	OB (n=104)	LB (n=96)	p-value
Age (years)	52.3	50.7	0.2
Parity	2.6	2.8	0.2
BMI	29.7	29.6	0.45
Operating time(min)	44	85	0.0001 *
Estimated blood loss (mls)	171	125	0.04 *
Pain score on coughing	6.1	4.4	0.0001 *
Duration catheter (days)	4.9	4.4	0.8
Hospital stay (days)	3.9	3.7	0.32
Voiding difficulty	7	7	1.0
De Novo detrusor instability	6	7	0.9
Postoperative rectocele	11	15	0.4
Return to normal activity (days)	21.8	17.3	0.02 *
High satisfaction (%)	94	89	0.4
Subjective success (%)	95	100	0.12
Urodynamic cure (%)	80	69	0.1

Conclusion: This study demonstrates that LB is as effective as the traditional OB procedure. The laparoscopic procedure was associated with less post-operative pain and an earlier return to normal activity but hospital stay was the same for both procedures. The operating time for the open colposuspension was less but was associated with greater blood loss. In this study success rates based on patient satisfaction were higher than urodynamic cure rate.

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BIOCHEMICAL CHANGES ASSOCIATED WITH STRESS URINARY INCONTINENCE AND THE EFFECT OF MENOPAUSE AND HORMONE REPLACEMENT THERAPY: A CONTROLLED STUDY

Aims of study

Genuine stress incontinence (GSI), a common gynaecological condition, is frequently due to bladder neck hypermobility caused by a weakness in the supporting structures of the pelvic floor. Its aetiology is almost certainly multifactorial. Collagen, a fibrous protein, forms the major structural component of vaginal epithelium and imparts tensile strength to the tissue. A significant reduction in total collagen, of vaginal tissue, has been demonstrated in nulliparous premenopausal women when compared to controls. There was an associated reduction in intermolecular collagen cross-linking, suggesting that the underlying defect within this population may be congenital rather than acquired (1). A similar reduction in collagen has not been clearly demonstrated in post menopausal women with GSI when compared to controls however, oestrogen therapy has been shown to produce a reduction in collagen content (2). The increased incidence of GSI around the menopause would suggest an alteration in collagen metabolism occurs at this time. We set out to further clarify the pathophysiological changes seen in women with bladder neck hypermobility: investigating the effect of menopause and additional hormone replacement therapy (HRT) on the supporting tissue on the pelvic floor.

Methods

Women recruited into this controlled study were placed in three groups: pre menopausal, postmenopausal without HRT and postmenopausal with at least 1 year of standard HRT. These were matched with continent controls in similar groups. All those with stress urinary incontinence symptoms had the diagnosis of GSI confirmed by conventional cystometric testing. The validated Bristol Female Lower urinary tract symptom questionnaire was used to exclude urinary incontinence in the control groups. The International Continence Society's female pelvic organ prolapse grading system was used to assess genitourinary prolapse and women were withdrawn with a score greater than 1. Tissue samples were taken peri-urethrally from the anterior vaginal wall using Eppendorfer punch biopsy forceps. The tissue was stored at -80 °C before undergoing biochemical analysis. Total collagen content was determined by hydroxyproline analysis and sulphated proteoglycan assay using dimethylmethylene blue. The protein content was assayed by microkjeldahl analysis. The data underwent analysis of variance using. Further analysis of glycation end products and proteinase activity is taking place.

Results

There were 116 women recruited into this study, 58 women in the incontinence group and 58 in the control group. In the incontinence group: 28 were premenopausal with a mean age 43 years (range 26-53), 14 were post menopausal without HRT with mean age 59 years (range 48-77) and the 14 in the postmenopausal group with HRT had a mean age of 56 years (range 46-63). In the control group: 28 were premenopausal with a mean age 41 years (range 28-56), 14 were post menopausal without HRT with mean age 61 years (range 52-73) and the 14 in the postmenopausal group with HRT had a mean age of 60 years (range 53-68).

	Control		GSI	
	Collagen (%)	Proteoglycans (µg/g)	Collagen (%)	Proteoglycans (µg/g)
Premenopausal	51.2 (± 14)	8.6 (± 0.3)	38.4 (± 11) *	9.6 (± 0.6) †
Postmenopausal No HRT	68.8 (± 18)	8.3 (± 0.5)	60.2 (± 13) *	10.4 (± 0.6) †
Postmenopausal with HRT	61.38 (± 23)	8.7 (± 0.3)	48.1 (± 13) *	9.6 (± 0.4) †

* Collagen in the GSI groups was lower than controls ($p < 0.001$), postmenopausal women had higher collagen concentration ($p < 0.001$) and HRT caused a reduction in collagen content ($p = 0.017$).

† Proteoglycan levels were higher in the GSI group throughout ($p < 0.001$). Both groups reacted differently to the menopause ($p = 0.004$) and to additional HRT ($p = 0.007$).

The protein content of the tissue was lower in the GSI group except in the postmenopausal group when the GSI group fell and control group increased however, this difference was significant ($p = 0.02$).