

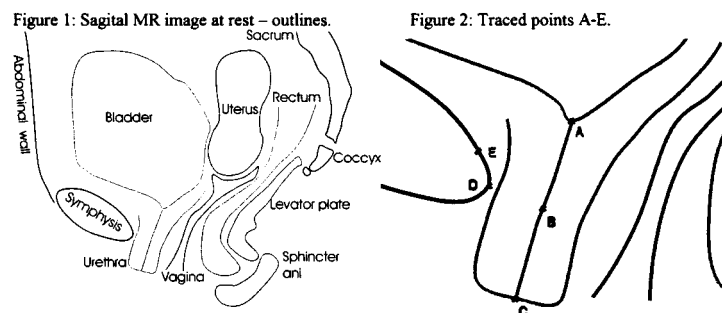
base in GSI patients and its changes after TVT. Dynamic magnetic resonance (MR) with its good tissue resolution clearly shows the situation at rest and during pressure manoeuvres.

Methods

10 women with proved GSI according to International Continence Society (ICS) standards were examined before and 2-4 months after TVT procedure. After emptying, the bladder was filled with 300 cc of sterile saline. In supine position, dynamic MR study of sagittal plane was done with 1.0 Tesla machine equipped with pelvic phased-array coil.

Images at rest, during maximal squeezing and Valsalva manoeuvre were analysed. For better visualisation, the outlines of structures were traced and drawn (Figure 1). Within the urethra, 3 points were marked: A – inner meatus, B – lumen in middle urethra, C – outer meatus (Figure 2). In case of funnelling, point A was placed at the level of bladder base in the middle of the open urethra. The position and mobility of these points, the shape of urethra and presence of funnelling were noted. Distances from lower edge of symphysis (point D) and from the lower one sixth of the posterior aspect of symphysis (point E) to the mentioned urethral points and their changes were measured. Point E should simulate the insertion of PUL, point D is a classical landmark of urogynecological imaging. The results before and after TVT were compared.

With the use of average values, models of pre and post TVT procedure were created and the dynamics of the changes were computer simulated.



Results:

We found statistically significant changes of urethral mobility in its entire course. The movement of the middle and proximal urethra was influenced less than the distal end.

The shape of the urethra during Valsalva manoeuvre has changed, but classical “kinking” was not dominant.

After the procedure funnelling was less pronounced.

Spectacular video presentations were made.

Conclusions

Contemporary dynamic MRI gives clear picture of female pelvic organs at rest and during pressure manoeuvres and produces data suitable for analysis of its mobility and involved forces.

TVT is a clinically successful method, but its precise mode of action is still not clear. We doubt the “kinking” is the only mechanism, our results favour the theory of increased hydrostatic pressure within the loop created by the tape and lower edge of symphysis pubis.

New informations are needed, a study involving intraabdominal pressure monitoring during MRI, 3-dimensional dynamic model and well correlated urodynamics could give definite answers.

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3. Contribution and timing of transmitted and generated pressure components in the female urethra. Female incontinence 113-120, Alan R Liss, New York 1981.

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Title (type in CAPITAL LETTERS, leave one blank line before the text):

TVT AND COLPOSUSPENSION: COMPARISONS AND CONTRASTS OF POSSIBLE MECHANISMS

Aims: Tension free Vaginal Tape (TVT) is believed to correct stress incontinence (SI) by mid-urethral

support(1,2) and the colposuspension (Colpo) by bladder neck elevation. We have already shown that TVT produces some bladder neck elevation at 1month but less than Colpo (3). This paper aims to compare urodynamic and outcome measures to gain insight into mechanisms of continence in the two procedures and assess whether the tape tightens with time.

Methods: Thirty-six women undergoing primary stress incontinence surgery were prospectively studied and non-randomised to TVT(n=20) or Colp(n=16). All had urodynamically proven SI without significant prolapse or detrusor instability (DI). Transperineal ultrasound (3.5MHz linear array probe) and microtip Urethral Pressure Profiles (UPP's) were performed pre-operatively then at 1 and 6months post-operatively. Subtraction cystometry (CMG) was performed pre- and 6months post-operatively. Scanning technique, calculations of bladder neck angles, movement on valsalva and post-operative elevation of the resting bladder neck position are described previously (3). The Mann-Whitney test was used for analysis between TVT and Colpo groups and Wilcoxon Matched Pair's test for analysis between pre and post-operative values. Correlation between bladder neck elevation (BNE) and other parameters was assessed by Pearson Correlation and Linear Regression.

Results: The average age and weight were 51years(SD10.7) and 73Kg(SD19.1); median parity 2(range 0-11), with no difference between TVT and Colpo groups(p> 0.44). The objective SI cure rate (CMG and 1hour pad test) at 6months for TVT was 74% with 26% improvement; and for Colpo was 88% cure with 12% improvement. Overall the post-op urge incontinence (UI) rate was 10.5% for TVT & 12.5% for Colpo. Sixty% had pre-op UI; 73% improved post TVT and 60% post Colpo. In each group, 2 patients needed to double void but none required long term catheters. There were no differences between groups for any pre-operative parameter (p>0.111).

There was a significant decrease in bladder neck movement and angles for both TVT and Colpo at 1and 6months compared with pre-op, except for resting angle at 6months for TVT. At both 1 and 6months post-operatively, movement and angles were significantly less for Colpo than TVT (p=0.00) and BNE significantly greater for Colpo than TVT (p<.02) i.e. elevation of 4.7mm(SD6.69) for TVT vs. 17.5mm (SD17.41) for Colpo at 1month and 2.1mm(SD4.92) for TVT vs 11.5mm(SD5.27) for Colpo at 6months. Elevation significantly decreased between 1 and 6months post-op (p< 0.037); the amount decreased was similar for both groups (p=0.197).

The following table compares pre-op and 6months post-op UPP and CMG values. Analyses were performed between pre- and post-operative values for each group and the post-op changes between groups.

	FULcough(SD)	MUCPcough(SD)	PTRquad1(SD)	PTRquad2(SD)	PeakFlowRate(SD)
TVT pre-op	15.1mm (6.63)	38.9cm(41.00)	105.7%(29.32)	93.6%(20.53)	32.8ml/s(17.35)
TVT post-op	19.2mm(4.48)	54.3cm(35.26)	106.7%(13.53)	118.6%(27.75)	23.5ml/s(10.82)
p(post vs. pre)	0.052	0.214	0.623	* 0.020	*0.035
Colpo pre-op	11.5mm(7.09)	35.5cm(34.05)	101.1%(7.63)	102.1%(18.56)	27.6ml/s(14.95)
Colpo post-op	19.9mm(8.43)	63.9cm(34.81)	111.2%(11.24)	122.1%(12.29)	24.3ml/s(11.91)
p(post vs. pre)	* 0.008	* 0.009	0.068	*0.020	0.187
p(TVT vs Colpo)	NS	NS	NS	NS	NS

FUL=functional urethral length, MUCP =maximal urethral closure pressure, PTR=pressure transmission ratio.

There was a similar significant improvement in PTRquad-3 as for PTRquad-2 but no improvement in PTRquad-4 for either group. Maximal void pressure did not change. There was a statistically but not clinically significant increase in urinary residual in both groups (25-31mls). The only UPP parameter that decreased over time between 1 and 6months post-op was FULcough, by 4.1cm water (SD 6.27), p=0.028. The level of bladder neck elevation correlated with improvement of MUCPrest at 6months for TVT (regression coefficient:1.70; 95%CI= 0.32-3.07 p=0.028) and showed a trend toward correlation with improvement PTR quad-1 for Colpo (regression coeff:1.94; 95%CI= 0.09-3.78 p=0.064).

Conclusions: Bladder neck elevation is greater with the Colpo than the TVT, and both decrease equally by 6months so there is no indication that the TVT is tightening over this time. The TVT produces a mid-urethral increase in pressure transmission (quad2&3); the site of continence for the TVT is likely to be

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mid-urethral. The Colpo produces a tendency toward an increased pressure transmission at the bladder neck (quad1) and an increase at the mid-urethra; the site of continence for the Colpo is likely to be the bladder neck but mid-urethral pressure changes may also play a part. The TVT decreases peak flow rate. Urge incontinence and voiding difficulties may not be avoided by the TVT despite its mid-urethral site of action. Longer and larger studies are required to fully assess TVT's mechanism of action and impact on bladder function.

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CONNECTIVE TISSUE CHANGES IN PATIENTS WITH GENUINE STRESS INCONTINENCE AND PELVIC FLOOR PROLAPSE

Aim of the study. Special interest has been given to changes in the quantity and quality of the periurethral collagen (1,2) in relation to the development of genuine stress incontinence(GSI) in women. It has been reported that total collagen reduction of the pubocervical fascia is associated with the development of G.S.I(1) and collagen production from the fibroblasts is reduced by 30% in women with GSI (3), but there is very limited information about changes in specific types of collagen in relation to the development of G.S.I. Objective of this study was to determine possible changes in the quantity of type III collagen and changes in the distribution and structure of collagen fibers for the formation of fascial network in women with G.S.I and with pelvic relaxation or not.

Methods. Eighty-six women participated in the study and they were divided in to three groups as follow : 34 patients with G.S.I and pelvic relaxation (group 1), 32 patients with pelvic relaxation but without G.S.I (group 2) and 20 patients with neither pelvic relaxation nor G.S.I (group 3). All the women underwent a complete preoperative urodynamic evaluation. Biopsies were obtained during surgery from the pubocervical fascia. The presence of collagen type III was determined by immunohistochemical technique and the structure and organization of collagen fibers was examined under the microscope using a magnification of 20X. The specimens were examined by two independent histopathologists. Specimens with disagreement between the examiners about the findings were excluded from the study. The Student's test was used for statistical analysis. A $p < 0.05$ was considered statistically significant.

Results. All groups of patients were comparable in respect to age, parity and body mass index. Groups 1 and 2 were also comparable in respect to the degree of pelvic relaxation. Urodynamic studies confirmed the diagnosis of G.S.I.

Collagen type III was significantly reduced ($p < 0.05$) in patients with G.S.I and pelvic relaxation (group 1), compared to patients in groups 2 and 3. Specimens from women without G.S.I (group 2 and group 3) had a similar density of collagen type III (Table I). Also, was noted a breaking of collagen fiber's bundles in association with a more abnormal distribution of collagen fiber's bundles, leaving gaps in the continuity of fascial network of the pubocervical fascia in women with significant prolapse.

Conclusion. In this study, we found that women with G.S.I had less collagen type III around the urethra regardless of the degree of pelvic relaxation. It appears that collagen content of the pubocervical fascia has a significant role in the maintenance of urinary continence but the mechanism by which collagen metabolism is altered remains unknown. Also, it appears that the development of genital prolapse is probably associated with breaking of collagen fibers bundles, but further studies are needed for safe conclusions to be made.

References.

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