PARAMETERS OF TWO-DIMENSIONAL PERINEAL ULTRASONOGRAPHY BEFORE AND AFTER MALE SLING PROCEDURE FOR URINARY INCONTINENCE AFTER RADICAL PROSTATECTOMY – Abstract 148

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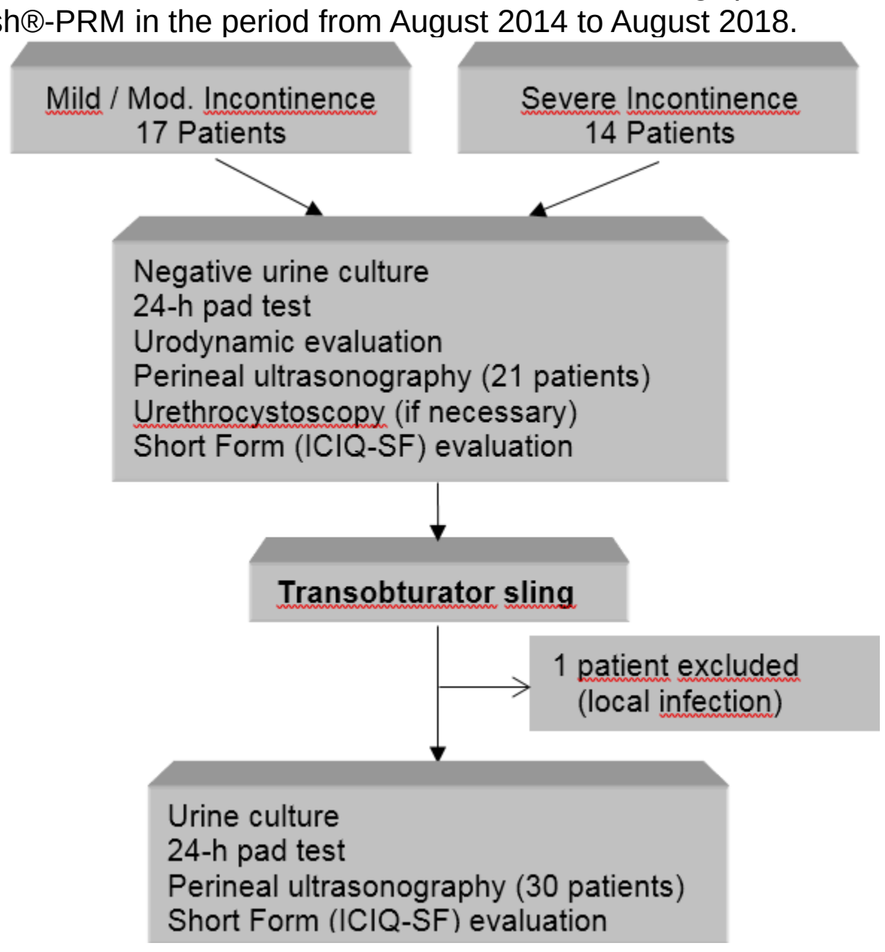
Hypothesis / aims of study

To compare ultrasonographic patterns of two-dimensional perineal ultrasonography in men in the pre and postoperative periods after transobturator sling deployment for the treatment of urinary incontinence after radical prostatectomy.

Study design, materials and methods

It is a prospective, multicenter (2 centers), non-randomized, uncontrolled study. The study involved 31 patients from the outpatient clinic of these two centers, with adequate indication for examination and surgery. These patients were selected according to the inclusion and exclusion criteria, being composed only of incontinent patients and divided into two different groups:
Group 1 - Mild / moderate incontinence (Pad test <400g / 24h);
Group 2 - Severe incontinence (Pad test> 400g / 24h).[1]
These patients were submitted to transobturator sling procedure with DynaMesh®-PRM in the period from August 2014 to August 2018.



The examination was performed with the patient in the supine position, with the legs slightly abducted, similar to the Lithotomy. The transducer was positioned with slight pressure in the perineal region (between the scrotum and the anus), in sagittal orientation, to obtain images of the pubic symphysis, bladder, bladder neck and urethra.[2] Ultrasonography was performed by the same examiner in both research institutions. We used the device SONACE 8000SE Medison, with a 2–5 MHz convex abdominal transducer at one institution. While in the second institution, we used the Toshiba Xario with an abdominal 3–6 MHz convex transducer.

During preoperative and postoperative examination, hypermobility of the proximal urethra, as well as voluntary contraction of the pelvic floor, were evaluated during Valsalva maneuver, perineal contraction and rest. We also evaluated the distance between de the urethra from pubis and the urethral angle.

Positioning of the bladder neck was performed at rest, during Valsalva maneuver and during contraction of the pelvic floor. The measurements were made by means of xy coordinate system, as the reference point the pubis. The X axis was drawn by a line at the upper border of the pubic symphysis. The Y axis was drawn perpendicular to the X axis at the upper border of the pubic symphysis. For exact positioning of the bladder neck, the most proximal and superior point of the urethral wall was used, in the immediate vicinity of the transition with the bladder. The movement of the bladder neck was calculated by the following formula: $\sqrt{(x2 - x1)^2 + (y1 - y2)^2}$, where x1 and y1 represent the coordinates at rest.[3] Statistical analysis was performed using SAS® version 6.11 (SAS Institute, Inc., Cary, North Carolina), with statistical significance defined at $p<0.05$.

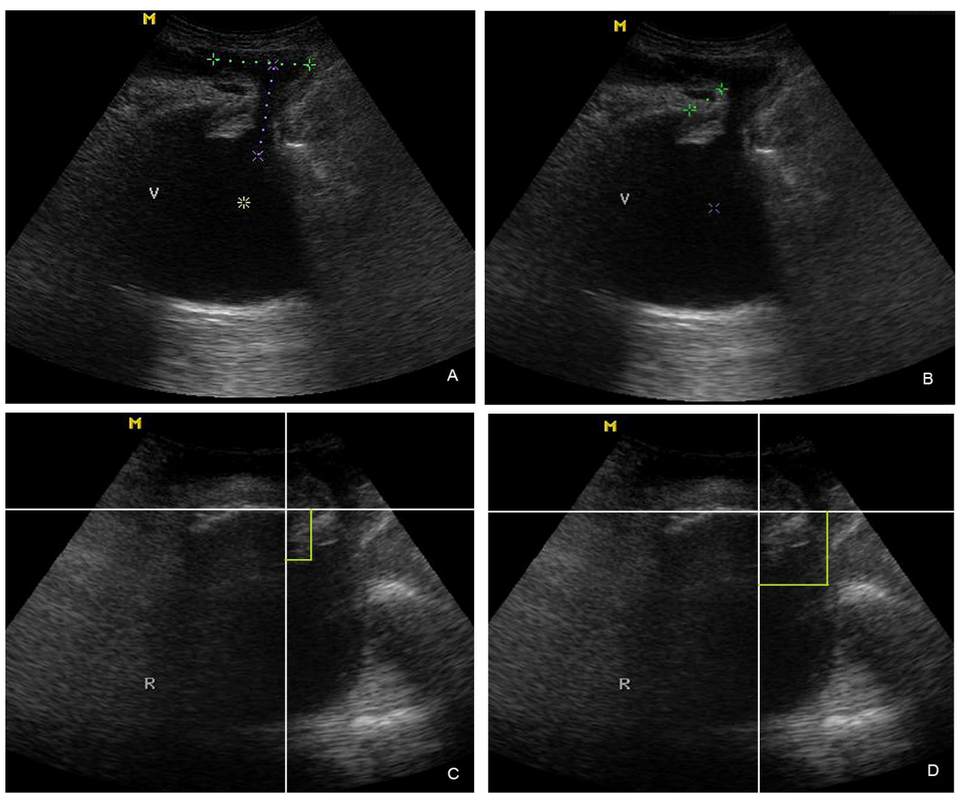


Figure 1 – Urethral angle [A] and pubis distance [B] during the Valsalva maneuver. Coordinates of the positioning of the anterior bladder neck [C] and posterior bladder neck [D] at rest

Results

In this study, the group with mild / moderate incontinence presented a clinical improvement (> 50%) significantly higher than the group with severe incontinence after male sling surgery (81,3% vs 42,9% p = 0.035). (Table 1). There was no statistical difference in relation to the Leak point pressure observed in the preoperative urodynamic evaluation between the two groups (p = 0.12).

Variable	Severe		Mild / Moderate		*p-value*
	n		n		
24-h Pad Test (g) – *n, median (IR)*	14	363 (203 – 565)	16	48 (0 – 108)	**0.008**
Improvement ≥ 50% - *n (%)*	6	(42.9%)	13	(81.3%)	**0.035**
Improvement ≥ 90% - *n (%)*	2	(14.3%)	7	(43.8%)	0.086

The Mann-Whitney test was used for numerical data. IR: Interquartile range

Table 1 - Assessment of clinical improvement in the postoperative period according to the severity of urinary incontinence.

There was no statistical difference in all the ultrasound parameters evaluated from preoperative to postoperative in the twenty one patients. Therefore, we chose to present the results of the thirty patients obtained postoperatively for the final analysis of the results. The incontinent group that evolved with clinical improvement > 50% after the male sling procedure showed the displacement of the posterior portion of the bladder neck during the contraction significantly greater than the incontinent group with clinical improvement <50% (p = 0.024). In the postoperative period, the ICIQ-SF score of the group with clinical improvement > 50% was significantly lower than the group with improvement < 50% (7 vs15 p=0.001). (Table 2)

Variable	Improvement (>50%), n=19		Improvement (<50%), n=11		*p-value*
Clinical variables					
24-h Pad Test (g)	50	(0 - 100)	405	(345 - 790)	**< 0.001**
Ultrasound parameters					
Anterior displacement during contraction (mm)	3.12	(1.67 - 4.32)	3.78	(0.91 - 4.66)	0.68
Posterior displacement during contraction (mm)	7.12	(4.76 - 10.6)	4.41	(2.06 - 8.20)	**0.024**
Anterior displacement during Valsalva (mm)	3.99	(1.66 - 6.28)	3.79	(1.33 - 4.79)	0.56
Posterior displacement during Valsalva (mm)	6.10	(4.36 - 9.6)	7.03	(1.84 - 8.6)	0.45
Pubis distance during rest (mm)	16.3	(12.6 - 18.2)	16.2	(13.5 - 18.1)	0.95
Urethral angle during rest (°)	92.0	(90.0 - 104)	92.0	(90.0 - 119)	0.95
Pubis distance during contraction (mm)	17.9	(14.3 - 20.7)	15.2	(14.8 - 18.9)	0.70
Urethral angle during contraction (°)	95.0	(90.0 - 102)	90.0	(83.0 - 110)	0.56
Pubis distance during Valsalva (mm)	18.5	(14.4 - 21.4)	14.8	(13.8 - 18.0)	0.33
Urethral angle during Valsalva (°)	97	(91 - 110)	93	(90 - 106)	0.53
Quality of life					
ICIQ-SF (points)	7.0	(0 - 12.0)	15.0	(10.0 - 18.0)	**0.001**

All parameters are presented as median (interquartile range) and were compared with the Mann-Whitney test.
ICIQ-SF: International Consultation on Incontinence Questionnaire-Short Form

Table 2 - Ultrasonography and quality of life parameters in the postoperative period according to the improvement in the pad test (50%)

Discussion

Urodynamic evaluation did not prove to be an adequate tool for stratification of groups, since there was no statistical difference in Valsalva Leak Point Pressure between the two groups. In addition, male sling did not promote a significant change in the ultrasound parameters from preoperative to postoperative in the twenty one patients evaluated.

The most important finding of this study was the significant ultrasound difference in the posterior displacement of the bladder neck during the contraction in patients who presented improvement (> 50%) in relation to those who presented improvement (<50%) p = 0.024. This latter data may support a possible use of perineal ultrasonography in the evaluation and selection of patients to undergo male sling. This lower mobility of the bladder neck in the incontinent group, especially in the most severe group, may be related to the degree of fibrosis of the periurethral tissues and partial denervation of the pelvic floor musculature during radical prostatectomy. These ultrasound findings are well-connected and may explain the surgical results of Fischer's study.[1]

Conclusions

Two-dimensional perineal ultrasonography provides more details on the diagnosis of male urinary incontinence after radical prostatectomy, and may help reduce treatment failure and define which method is most appropriate for each patient. Parameters of perineal ultrasonography in men are still not well established and the results obtained in our work may help to guide future studies in this area.

References

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