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THE INFLUENCE OF TUR OR OPEN PROSTATECTOMY ON ULTRASOUND ESTIMATED BLADDER WEIGHT (UEBW): A PROSPECTIVE STUDY ON 26 PATIENTS.

Aims of Study

As reported in different papers by Kojima and Tubaro (1,2,3), a non invasive quantitative estimation of infravesical obstruction using ultrasonic measurement of bladder weight seems to be able to predict objectively and quantitatively the measurement of bladder hypertrophy. The objective of the study is to evaluate the effect of surgery or endoscopy on the detrusor hypertrophy in urinary obstructed patients using a non invasive method as ultrasound estimated bladder weight (UEBW).

Methods

Between November 2002 and March 2003 a group of 26 patients already candidate for endoscopical or open prostatectomy were evaluated using ultrasound estimated bladder weight (UEBW), ultrasound bladder wall thickness (BWT), flowmetry and ultrasonic post-void residual (PVR). The estimated bladder weight was measured preoperatively, 4 weeks and 12 weeks postoperatively using transabdominal ultrasonography with a 7.5Mhz probe. A longitudinal scan was obtained on the midline of the lower abdomen above the distended bladder before an uroflowmetry. The thickness of the anterior bladder wall was measured at 3 points approximately 1 cm apart and the average value was recorded as BWT. Following ultrasonic measurement, infravesical volume was calculated by adding uroflowmetry voided volume and post-void residual urine volume estimated by ultrasound. Assuming the bladder as a sphere, UEBW was calculated from bladder wall thickness and infravesical volume as described by Kojima (1). The uroflow data reported were obtained by the same uroflowmetry for the bladder weight evaluation. All patients signed a preoperative informed consent also to permit a sample of the bladder wall and then underwent an already established operation: TUR or Open Prostatectomy. The ultrasound estimated bladder weight, BWT, uroflowmetry and PVR were performed 4 and 12 weeks postoperatively. It was also scheduled to complete the control at 24 weeks. Values are expressed as a mean plus or minus standard deviation. Statistical evaluation was performed comparing postoperatively data with baseline using Student's t-test and <0.05 was defined as statistical significant. A statistical correlation between the results of two operations is calculated at 4 and 12 weeks controls.

Results

Twentysix men with a mean age of 70,88yrs (±8,01SD) were included. Fourteen (mean age 71,79yrs ± 6,97 SD) underwent open prostatectomy and 12 patients (mean age 69,83yrs ± 9.29 SD) transurethral resection. The two groups did not statistically differ for age. On Table 1 are reported all data obtained in the two groups of treatment at baseline and at each control. The comparison with baseline demonstrates that BWT decreases at each timing controls, with statistical significativity for TUR. The UEBW has a significant reduction after 4 weeks for TUR, and a numerical decrease after open surgery. Flowmetry demonstrates a no significant increase of the Qmax, instead of a contrastant evaluation of PVR after 12 weeks post TUR. No significant differencies are obtained comparing the results between the two groups at 4 and 12 weeks. No statistical correlation is obtained between BWT and the measurements of detrusor thickness specimens.

Conclusions

The results obtained seem to confirm the correlation between bladder hypertrophy and infravesical obstruction and the decrease of bladder wall thickness after surgical relief of obstruction: the uroflow improves as time passes, the postvoid residual volume decrease as ultrasonic estimated bladder wall thickness and bladder weight tend to decrease. In this study data obtained by ultrasound could be comparable with data reported in literature. The statistical analysis is influenced by the low number of patients at each control especially at 12 weeks, but a trend of the influence of TUR or open prostatectomy on the detrusor wall could

be estimated. Ultrasound evaluation of the bladder hypertrophy would be, in a not far future, a non-invasive easy to use tool to support the diagnosis of the infravesical obstruction.
All results are summarize in Table 1.
Table 1

TUR	**Baseline**	**4weeks**	**12weeks**
Patients	12	10	7
Age	69,83 ± 9,29ys	-	-
BWT	0,37 ± 0.13cm	0,27 ± 0,07*	0.22 ± 0.07**
UEBW	75,95± 23,71gr	58.36 ± 10.48*	66.91± 29.6
BWSpecimen	0.21 ± 0.06cm	-	-
Q max	9.25 ± 3.89ml/sec	17.26 ± 6.77^	21.96± 7.52^^
PVR	75.58ml	46.4	58.4
Prostatectomy			
Patients	14	8	4
Age	71,79 ± 6.97ys	-	-
BWT	0.33 ± 0.12cm	0,24 ± 0.04	0,21± 0.05
UEBW	62,35 ± 19.07gr	44,86 ± 21.1	44,44± 18.9°
BWSpecimen	0.45 ± 0.20cm	-	-
Q max	3,62 ± 4.6ml/sec	15,23 ± 3,86	21,13 ± 4.1
PVR	92,2ml	17.48	9.41

* $p < 0.005$ on Student's t-test vs Baseline ** $p < 0.005$ vs Baseline ^ $p = 0.005$ vs Baseline ^^$p = 0.005$ vs Baseline ° $p = 0.05$ vs Baseline

References

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