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Title: CLINICAL APPLICATION OF TRANSPERINEAL DOPPLER ULTRASOUND VIDEOURODYNAMICS: EVALUATION OF MICROWAVE THERAPY FOR BENIGN PROSTATIC ENLARGEMENT

Aims Of Study:

We have measured velocity in the urethra noninvasively using a transperineal Doppler ultrasound video urodynamic study[1]. With this technique, we evaluated the efficacy of transurethral microwave thermotherapy(TUMT: Targis^{TM}) in the treatment of benign prostatic enlargement(BPE).

Methods:

Six men with symptomatic BPE underwent transperineal Doppler ultrasound urodynamic studies before and after TUMT. The subjects were seated on a uroflow micturition chair. The probe was advanced via remote control robotic manipulator to achieve gentle contact with the perineal skin. During voiding, simultaneous Doppler ultrasound and uroflowmetry information were recorded. The digital uroflow data signals and color Doppler ultrasound image were processed after voiding using custom made software. Two square sample areas(1cm^2) were set to cover the distal prostatic urethra just above the external sphincter and the membranous urethra below it, respectively. Mean signal intensity was calculated every 0.5sec and flow velocity curves were obtained. The maximum flow velocities just above the sphincter(V_1) and below the sphincter(V_2) were obtained and used to derive the velocity ratio($VR=V_1/V_2$). Corresponding functional cross-sectional areas of the urethra(A_1 and A_2) were calculated that maximum flow rate(Qmax) was divided by maximum flow velocity(V_1 and V_2), respectively. All parameters obtained by velocity-flow urodynamics were compared before, two weeks after and two months after TUMT.

Results:

The velocity-flow data are shown in the Table. At two weeks after microwave therapy, although Qmax transiently decreased by 20%, A_1 increased by 93%. These results suggests that post treatment irritability causes insufficient voided volume expelled around two weeks after microwave treatment. After two months, both Qmax and A_1 increased markedly and VR decreased significantly. The efficacy after two months of TUMT would be obtained by resolution of bladder outlet obstruction.

Table: Parameters obtained by transperineal Doppler ultrasound videourodynamics

	Qmax(ml/s)	V_1(cm/s)	V_2(cm/s)	A_1(cm^2)	A_2(cm^2)	VR
Before	7.4	54.6	40.0	0.14	0.19	1.41
2WKS	5.9	22.4	37.4	0.27	0.16	0.61
2MOS	16.3	17.5	36.9	0.93	0.45	0.49

Conclusions:

The transperineal Doppler ultrasound video urodynamic study is not only noninvasive but also powerful tool for analyzing the velocity-flow urodynamic effect of BPE treatment.

Reffrences:

1. J Urol 160,1792-1796,1998.
2. Urology 56,408-412,2000..