

INTRAVESICAL PROTRUSION OF THE PROSTATE AS A PREDICTING METHOD OF BLADDER OUTLET OBSTRUCTION

Hypothesis / aims of study

The objective of this study was to define how the intravesical prostatic protrusion (IPP) and prostate volume, measured through abdominal ultrasound, may alter the vesical's voiding and determine the accuracy of this measurement compared to conventional urodynamics in diagnosing bladder outlet obstruction (BOO).

Study design, materials and methods

A prospective study was carried out with forty-two men presenting with Lower Urinary Tract Symptoms (LUTS), in the period ranging from June to August/2005, these patients were evaluated through anamnesis, International Prostatic Symptoms Score (IPSS) and Quality of Life (QoL) questionnaires; physical, neurological and digital rectum examination.

They were all submitted to conventional urodynamic evaluation and classified according to the Abrams-Griffiths Nomogram.

After one week the patients were submitted to ultrasound study performed by the same physician blind of the urodynamic results. Abdominal ultrasound was performed and IPP along with the prostatic volume were measured. According to some studies, the bladder was filled with at least 100mL of urine in order to consider the IPP determination; this was achieved through the ingestion of one liter of water in a two hour period after voiding. IPP was defined by the distance from the tip of the prostate's protrusion into the vesical lumen to the bottom of the prostate measured in millimeters. Measures were divided into three degrees: grade I < 5mm, grade II 5-10mm, grade III >10mm.

Results

The mean age of the 42 men was 64.8 ± 8.5 years, mean IPSS was 13 ± 6.9 and mean IPSS QoL was 1.9 ± 1.5 . Digital rectum examination determined a mean prostatic volume of 39 ± 8.1 g, while ultrasound measures had mean of 45 ± 3.2 g.

The pressure/flow study showed mean Qmax of 8.5 ± 4.3 , Pdet.qmax of 58.1 ± 26 , and urinary post voiding residue of 70 ± 177 . Based on Abrams-Griffiths, 20 (47.6%) patients presented obstruction, 12 (28.5%) were inconclusive and 10 (23.9%) did not present obstruction.

IPP's values obtained were as follows: grade I – 12 (28.5%), grade II – 5 (12%) and grade III – 25 (59.5%). There was a positive significant correlation between the prostatic volumes and IPP measured by ultrasound compared to the obstruction defined by the number of Abrams-Griffiths ($p = 0,03$ and $p = 0,016$, respectively).

Table 1 demonstrates that IPP's grade III reaches up to 80% sensibility and 78.9% specificity for diagnosing infravesical obstruction. Positive predictive value was of 69% and the negative predictive value, 78,9%.

Interpretation of results

Clinical data such as IPSS, post voiding residue and flowmetry have been previously demonstrated to correlate mostly to a lower urinary tract functional status rather than mechanical obstruction itself. Therefore, noninvasive measures of the prostate intend to delineate a morpho-functional correlation in order to orient conduct towards LUTS secondary to benign prostate obstruction.

Recently, other study demonstrated the possibility of using the intravesical prostatic protrusion measurements for diagnosing infravesical obstruction. The study achieved 76% sensibility and 92% specificity for IPP's grade III in relation to obstructed patients with Abrams-Griffiths's number over 40. In this present study values were of 80% and 78.9% respectively. IPP was also a predictor of the capacity for spontaneous void after acute urinary retention.

Many other noninvasive parameters were also tested in order to classify BOO such as bladder vesical wall width and PSA values, but specificity and sensibility was low.

Intravesical protrusion seems to corroborate to urinary obstruction through a "valve ball" mechanism, in which the prostate's lateral and medium lobes interfere on the complete opening of the vesical neck while the patient urinates. According to this mechanism and based on the present study, it was demonstrated that the intravesical protrusion of the prostate relates not only to the urinary obstruction itself, but it also provides information concerning the severity of obstruction. It has been demonstrated that the greater the IPP, the higher the Abrams-Griffiths's number. Still significant, but to a lesser extent, results of prostatic volume obtained through ultrasound also related to the degree of obstruction.

Concluding message

IPP and prostatic volume measured through abdominal ultrasound are simple, cheap, reproducible, quick, noninvasive and accessible methods that significantly correlate to urinary infravesical obstruction, and diagnose male urinary obstructive problems.

Table 1

	AG number			
	> 40	< 40	total	
IPP				
G I - II	4	15	19	Specif. 78,9%
G III	16	7	23	
total	20	22	42	
	Sens.80%			

Specify source of funding or grant	None
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Comitê de Ética em Pesquisa UNICAMP / Sistema Nacional de

Ética em Pesquisa

Was the Declaration of Helsinki followed?**Yes**

Was informed consent obtained from the patients?**Yes**
