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## ORIGINAL RESEARCH

# Retrospective evaluation of the outcome of initial trial without catheter in benign prostatic hyperplasia patients with intravesical prostatic protrusion of different grades presented with acute urinary retention

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## ABSTRACT

**Introduction: Intravesical prostatic protrusion (IPP), a unique anatomical configuration has recently become a very significant component in the evaluation of BPH patients. Hence the present study aimed to evaluate the outcome of initial trial without catheter in Benign prostatic hyperplasia patients with IPP of different grades presented with acute urinary retention.**

**Materials & methods: The retrospective study conducted at Urology unit, Department of General Surgery, Agartala Government Medical College, Agartala from September 2018 to January 2022. Patient fulfilling the inclusion criteria were included in the study. Data sheet was completed where the patient's demographics, IPSS, PSA, total prostate volume, IPP and its grade, peak flow rate of voided patients, PVRU was recorded and analyzed.**

**Results: Mean patient age was 69.76±9.54 years (range 52 to 87) in group A, 67.80±7.70 years (range 54-82) in group B and 66.23±8.84 years (range 51-81) in group C. Mean value of IPP was greater in group C with statistically significant result with p value <0.01 comparing group A and C. Correlation between IPP with other pre-treatment parameters show significant results with TPV, TZV, TZI, QoL, PUFR & PVRU.**

**Conclusion- IPP is a helpful indicator for determining whether a voiding trial after ARU was successful. A trial without a catheter may be advantageous for BPH patients with grade 1 IPP. Patients with grade III IPP, on the other hand, are less likely to do so and would need a more thorough surgical intervention.**

**Keywords: catheterization, prostate, prostatic hyperplasia, ultrasonography, urination**.

## INTRODUCTION

Benign prostatic hyperplasia (BPH), an all-time tragedy of an aging male is estimated to produce symptoms in 50% of cases in their 60s and almost 90% in their 90s [1]. Therefore, it is not surprising for a male seeking frequent medical advice for lower urinary tract symptoms (LUTS) secondary to BPH. Since 1980s, medical treatment for BPH has evolved significantly and currently regarded as an option in its own right for those individuals who lack absolute

indications for surgery. The preferred candidate for medical treatment includes patients without bothersome LUTS, without obstructive complications, small sized prostate and unwilling or surgically unfit patients**.** Acute urinary retention (AUR) is the most important event in the natural history of benign prostatic hyperplasia (BPH) that calls for urinary catheterization. Trial without catheter (TWOC) is an ambulatory care protocol, failure of which requires re-catheterization, a follow-up visit, subsequent evaluation, and surgical intervention [2]. Intravesical prostatic protrusion (IPP), a unique anatomical configuration has recently become a very significant component in the evaluation of BPH patients. Intravesical prostatic protrusion predicts the outcome of a trial without catheter following acute urine retention (AUR) [3]. However, its technical consideration in BPH patients presented with AUR is not well known to the community of the urologists, physicians and general practitioners. This is mostly because of poor emphasized and limited knowledge on this topic. The present study aimed to evaluate the outcome of initial trial without catheter in Benign prostatic hyperplasia patients with IPP of different grades presented with acute urinary retention.

## MATERIAL AND METHODS

The retrospective study conducted at Urology unit, Department of General Surgery, Agartala Government Medical College (AGMC), Agartala from September 2018 to January 2022. Study population consist of patients with a first episode of AUR secondary to clinical benign prostatic enlargement with trans-abdominal ultrasound (TAUS) findings of intravesical prostatic protrusion.Patients who were admitted to the urology ward of AGMC during the study period (September 2018 to January 2022) with first episodes of acute urinary retention secondary to clinical BPH with documented trans-abdominal ultrasound findings of IPP and its grading and who has undergone a voiding trial without catheter on day three or more of catheterization in the urology ward after initiation of alpha-1 adrenergic receptor antagonist were included in the study. Excluded subjects were those with suspected/confirmed case of prostate cancer, chronic urinary retention, urinary tract infection, renal impairment, bladder or urethral stones, bilateral hydronephrosis or those with neurological disorders affecting continence, such as cerebral vascular accident.Data was retrieved from the treatment register of the Urology ward of AGMC & GBPH between September 2018 to January 2022. Data sheet was completed where the patient's demographics, international prostate symptom score (IPSS),serum prostate specific antigen (PSA),total prostate volume, IPP and its grade, peak flow rate of voided patients, post-void residual urine volume (PVRU) was recorded.

## STATISTICAL ANALYSIS

Data entry and analysis was performed on a computer using Statistical Package for the Social Sciences (SPSS) for Windows. Data was presented in the form of text, tables, charts, etc. Fisher's exact and independent T-test was used to evaluate the outcome of TWOC where a p-value $<0.05$ will be considered statistically significant. Correlation between intravesical prostatic protrusions with other pre-treatment parameters was carried out by Pearson's rank correlation coefficient.

## RESULTS

Pre-treatment characteristics of the patients among groups is shown in table 1. Mean patient age was 69.76±9.54 years (range 52 to 87) in group A, 67.80±7.70 years (range 54-82) in group B and 66.23±8.84 years ( range 51-81) in group C. Mean serum PSA was 5.49±4.00ng/ml in group A, 5.05±3.18ng/ml in group B &4.95±2.69ng/ml in group C. The average intravesical prostatic protrusion was 2.61±0.64mm in group A, 6.78±1.05mm in

group B and 15.41±1.82mm in group C. the results were statistically significant when comparison was between group A and C with p value <0.001.

| TableI:Pre-treatment characteristics of the patients among groups | | | | | | |
|---|---|---|---|---|---|---|
| **Parameters** | **Group-A(N-25) Mean±SD(range)** | **Group-8 (N-29) Mean±SD (range)** | **Group-C(N-13) Mean±SD (range)** | **p-value** | | |
| | | | | **A vs. B** | **B vs. C** | **A vs. C** |
| Age(year) | 69.76±9.54 (52-87) | 67.80±7.70 (54-82) | 66.23±8.84 (51-81) | 0.182 | 0.553 | 0.628 |
| PSA(ng/ml) | 5.49±4.00 (1.20-16.39) | 5.05±3.18 (0.8-14.23) | 4.95±2.69 (1.63-9.87) | 0.540 | 0.125 | 0.382 |
| TPV(ml) | 43.42±7.59 (32.76-60.70) | 48.50±7.86 (30.53-63.72) | 55.40±11.64 (38.17-68.43) | 0.947 | 0.012 | 0.008 |
| TZV(ml) | 11.09±4.68 (4.82-19.70) | 20.37±4.59 (12.50-27.02) | 30.18±7.14 (16.63-39.58) | 0.876 | 0.020 | 0.031 |
| TZI | 0.32±0.05 (0.21-0.44) | 0.37±0.10 (0.14-0.56) | 0.51±0.05 (0.39-0.61) | 0.038 | 0.089 | 0.820 |
| IPP(mm) | 2.61±0.64 (1.54-4.12) | 6.78±1.05 (5.12-9.01) | 15.41±1.82 (11.75-17.46) | 0.018 | 0.032 | <0.001 |

Group-A (IPP of <5mm); Group-B(IPP of 5-1Omm);Group-C (IPP of >1Omm);N-number; PSA-prostate specific antigen; TPA-total prostate volume, TZV-transition zone volume; TZl-transition zone index ;IPP-intravesical prostatic protrusion Statistical evaluation of the baseline and endpoint characteristics is shown in Table 2. All the three groups A,B& C were tested on the basis of IPSS score, QoL, Qmax and PVR. None of the results were statistically significant with p value greater than 0.05.

| Table II : Statistical evaluation of the baseline and endpoint characteristics | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameters** | | **IPSS score Mean±SD(range)** | | | **QoL** | **Qmax( ml/sec)** | **PVR(ml) Mean±SD (range)** |
| | | **Total score** | **Irritatives ubscore** | **Obstructive subscore** | **Mean± SD (range)** | **Mean± SD (range)** | |
| Group A | Baseline | 22.44±14.51 (12-31) | 7.44±12.00 (3-12) | 14.72±4.39 (6-24) | 2.48+0.82 (1-4) | 13.29+2.38 (10.00-17.20) | 75.29±18.20 (49.50-113.85) |
| | Endpoint | 11.32+3.00 (7-17) | 4.04±10.84 (2-5) | 7.23+2.47 (3-14) | 1.76+0.60 (1-3) | 15.69+1.62 (13.50-20.70) | 43.19±13.76 (21.64-90.16) |
| | p-value | 0.027 | 0.050 | 0.019 | 0.047 | 0.033 | 0.046 |
| Group B | Baseline | 24.83±5.29 (15-34) | 7.86±11.43 (4-10) | 16.97±5.63 (6-31) | 3.14±0.68 (2-5) | 11.90±1.38 (9.60-15.40) | 83.47±23.66 (56.70-145.23) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Endpoint | 13.69±13.40 (8-21) | 4.72+0.96 (3-7) | 9.00+3.75 (2-17) | 2.34+0.48 (2-3) | 13.08± 1.82 (10.30-18.60) | 63.25±18.18 (30.00-87.20) |
| | p-value | 0.037 | 0.036 | 0.052 | 0.726 | 0.251 | 0.080 |
| Group C | Baseline | 25.76±4411 (21-35) | 8.76±1.74 (4-12) | 19.15±14.10 (14-30) | 4.46±10.97 (2-6) | 6.86±11.02 (5.30-8.50) | 156.09+36.07 (73.28-212.05) |
| | Endpoint | 24.84+3.80 (19-35) | 5.69+0.85 (5-8) | 17.00±5.46 (11-31) | 4.53+0.78 (3-6) | 6.40±1.64 (3.10-9.00) | 179.16. ±62.48 (53.28-280.34) |
| | P value | 0.487 | 0.438 | 0.399 | 0.675 | 0.137 | 0.214 |

Correlation between IPP with other pre-treatment parameters is shown in table 3. Statistically significant results with p value <0.001 was seen wrt total prostate value , transition zone volume, , transition zone index, quality of life, Peak urinary flow rate, Post-void residual urine with value of r as 0.481, 0.755 ,0.645, 0.869, 0.758 &0.682 respectively.

**Table-III: Correlation between IPP with other pre-treatment parameters**

| Parameters | Correlation coefficient (r) | p-value |
|---|---|---|
| Age | 0.134 | 0.279 |
| Prostate specific antigen | 0.105 | 0.400 |
| Total prostate volume | 0.481 | <0.001 |
| Transition zone volume | 0.755 | <0.001 |
| Transition zone index | 0.645 | <0.001 |
| Total IPSS score | 0.191 | 0.121 |
| Irritativesubscore | 0.101 | 0.414 |
| Obstructive subscore | 0.295 | 0.015 |
| Quality of life | 0.869 | <0.001 |
| Peak urinary flow rate | 0.758 | <0.001 |
| Post-void residual urine | 0.682 | <0.001 |

IPP-lntravesical prostatic protrusion;IPSS- international prostate symptom score

## DISCUSSION

Intravesical prostatic protrusion can be defined as a protuberance of enlarged median and or lateral lobes into the bladder secondary to morphological changes within the prostate. It produces significant impact on the storage and voiding function of the bladder because of a ball-valve type of outlet, and irritation of the bladder neck or trigone respectively (Fig. 1). [4-5] One of the most severe complications of BPH is ARU. On how to treat ARU caused by BPH, there is no agreement, though. While TWOC is performed at certain circumstances to evaluate spontaneous voiding ability, at others an episode of ARU serves as a direct signal for surgical intervention without the requirement for TWOC. Up to 23% of patients, it has been discovered, did not require surgery. [6] According to earlier research, between 23% and 55% of patients in ARU had successful TWOC. [7-9]IPP was a strong predictor of TWOC failure in the current investigation. Although a prior study indicated that prostate size was a significant predictor of the outcome of TWOC, [9] this was not supported by the current study or a subsequent one. [10] In our investigation, the group with an IPP value larger than 10 mm showed greater values for TZV, TPV, and TZI in comparison to groups with an IPP

value less than 5 mm. According to this finding, individuals with grade IIIIPP in ARU should receive more intensive treatment. They are more prone to experience recurrent retention even when TWOC is successful. However, in a 2003 study by Chia S.J. et al., 23 patients (64%) with a grade 1 prostate underwent effective TWOC at a follow-up of up to 6 months. [4]Despite the fact that numerous other variables have been researched, none have consistently been demonstrated to be important for predicting the result of TWOC. Patient age did not assist in identifying those who might benefit from successful TWOC. [6,7] The mean patient age in our study was 69.769.54 years, which was comparable to research conducted by Tan HY [3] in 2003, which demonstrates the prevalence of this condition in those older than 60. Additionally, it was claimed that patients who had lower post void residual urine had a higher chance of regaining satisfying voiding. Nevertheless, it failed to show promise in both the current and other studies. [4] Patients with failed larger IPP had higher serum PSA levels, which was statistically significant. This result supported our earlier research. [5] High PSA levels were likely caused by a prostatic infection or prostatic infarction that was connected to or the cause of the acute episode of urinary incontinence brought on by BPH. But it has to be supported by more thorough research.

## CONCLUSION

IPP is an easy-to-use clinical predictor that can be used to assess the success of a voiding trial after an ARU. The grades of IPP affects the result. TWOC may be helpful for patients with grade IIPP. Patients with grade IIIIPP, on the other hand, have a lower likelihood of doing so and would need a more conclusive surgical technique, like transurethral resection. A useful clinical parameter for assessing patients in ARU isultrasonographic measurement of IPP.

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