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Research Article

## OUTCOME AND SAFETY OF BIPOLAR TRANSURETHRAL RESECTION IN SALINE (TURIS) IN B.P.H PATIENTS WITH RETENTION OF URINE

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**Abstract:**

**Background and aim:** Transurethral resection of prostate is the gold standard for the treatment of benign prostatic hyperplasia. To reduce the risks of the monopolar circuit, resectoscopes are today commercially available, which by behaving like electric dipoles, allow the patient to be excluded from the circuit. This allows the use of physiologic saline as irrigation solution annulling the risk of a TUR syndrome and intoxication by glycine. In the literature many papers confirm the equivalence in clinical outcome between mono and bipolar resection (5) but there is currently little available data on the more effective safety of bipolar devices. This study was done to asses outcome and safety of TURIS in B.P.H patients with retention of urine

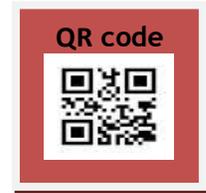
**Objective:** This study was addressed to asses outcome and safety of TURIS in B.P.H patients with retention of urine at our institute.

**Patient and methods:** Between (January 2014 and August 2018), 285 patients of B.P.H with retention of urine underwent TURIS at our institute. All the procedures were carried out on bipolar device equipment Autocon® 400 ESU in normal saline (0.9%). The resectoscope used was 26 FR (Karl Storz) loop = 24 FR size with continuous irrigation system.

**Results:** Age of the patients ranged from 50 to 85 years and volume of prostate ranged from 40 – 100 gm. The postoperative follow up ranged from 3 months to 20 months. None of the patients developed TURP syndrome or skin burns. Post operatively 7 patients (2.4%) developed haematuria necessitating blood transfusion and 3(1.05%) needed redo fulguration. Two (0.7%) developed orchitis, none of the patients developed renal failure and TURP syndrome. Out of 285 patients 270 (94.7%) were catheter free. In long term follow up two (0.70%) patient developed stricture urethra and none bladder neck contracture during follow up.

**Conclusion:** Our results demonstrates that TURIS is safe and efficacious in B.P.H patients with retention of urine with minimum morbidity and no mortality it avoids the risk of TURP syndrome but with more episodes of bleeding.

**Keywords:** TURP, TURIS, Monopolar, Bipolar

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**INTRODUCTION:**

Transurethral resection of prostate is the gold standard for the treatment of benign prostatic hyperplasia which is the most common non-malignant disorder of the prostate, affecting over 50% of the elderly male population.(1) Notwithstanding the continuous amelioration of the surgical equipment and the progress made in anesthesiology, the intervention still has a certain morbidity.(2,3) Transurethral resection (TUR) syndrome, for example, is a rare (4) but serious clinical complication of a monopolar resection carried out with a electrolyte-free irrigation solution (e.g., glycine). The latter irrigation solution is further toxic in particular concentrations and can aggravate the clinical picture. To reduce the risks of the monopolar circuit, resectoscopes are today commercially available, which by behaving like electric dipoles, allow the patient to be excluded from the circuit. This allows the use of physiologic saline as irrigation solution annulling the risk of a TUR syndrome and intoxication by glycine. These bipolar electrosurgical units are available from different manufacturers. The benefits of bipolar, high-frequency current has been realized by different manufacturers on the basis of the improvements in high-frequency generators, and the standard monopolar TURP is now being challenged by bipolar resection. (5)

Since its introduction, bipolar TURP has gained much popularity and has become available worldwide and, currently, challenges monopolar TURP as being the gold standard in treating BPH. The proposed advantages of bipolar resection are improved hemostasis, better intraoperative visualization, and the use of saline as an irrigant, which reduces the risk for TUR syndrome. (6) Some studies also reported shorter catheterization time and reduced hospital stay. (7) In the literature many papers confirm the equivalence in clinical outcome

between mono and bipolar resection (8) but there is currently little available data on the more effective safety of bipolar devices.

**OBJECTIVE:**

To asses outcome and safety of TURIS in B.P.H patients with retention of urine at our institute.

**PATIENT AND METHODS:**

Between (January 2014 and August 2018), 285 patients of B.P.H with retention of urine underwent TURIS at our institute. All the procedures were carried out on bipolar device equipment Autocon® 400 ESU in normal saline (0.9%). The resectoscope used was 26 FR (Karl Storz) loop = 24 FR size with continuous irrigation system.

In the postoperative period, episodes of haematuria, TURP syndrome, blood transfusion, thermal skin lesions, operation time, hospital stay, and fever were noted during admission. After discharge these patients were followed in prostate clinic for episode of retention, stricture urethra and bladder neck contracture; UFM was routinely done in all patients post operatively after removal of catheter.

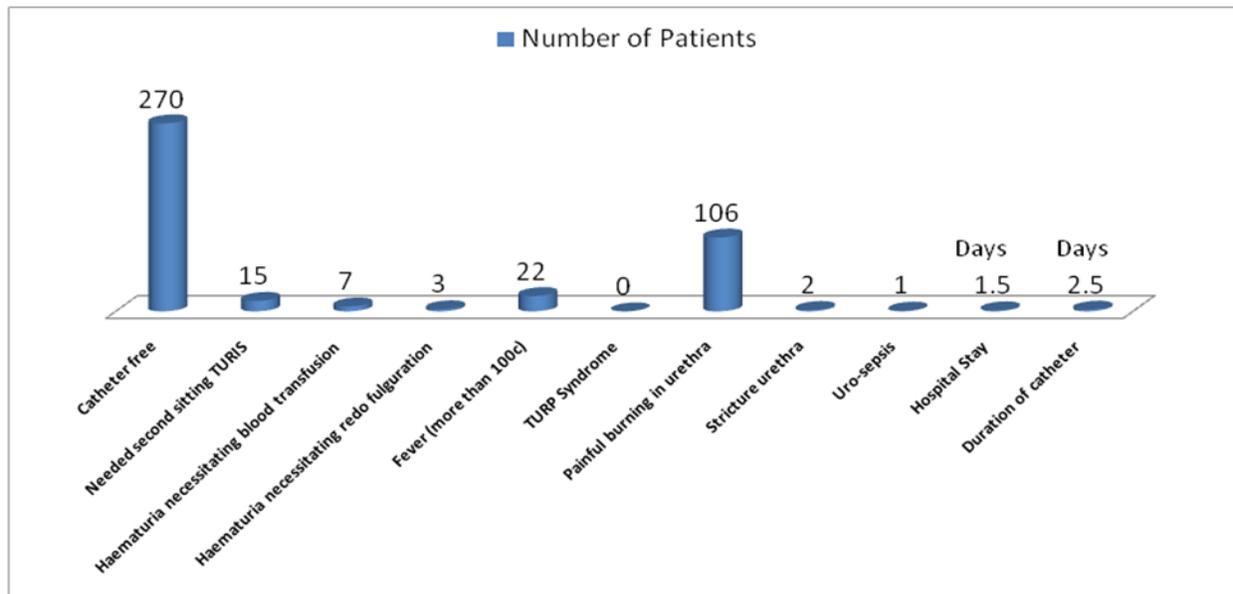
**RESULTS:**

Age of the patients ranged from 50 to 85 years and volume of prostate ranged from 40 – 100 gm. The postoperative follow up ranged from 3 months to 20 months. None of the patients developed TURP syndrome or skin burns. Post operatively 7 patients (2.4%) developed haematuria necessitating blood transfusion and 3(1.05%) needed redo fulguration. Two (0.7%) developed orchitis, none of the patients developed renal failure and TURP syndrome. Out of 285 patients 270 (94.7%) were catheter free. In long term follow up two (0.70%) patient developed stricture urethra and none bladder neck contracture during follow up.

**Table-I Showing****Complications and success rate of trans-urethral resection of prostate in saline (TURIS).**

Outcome	No.	(%)
1. Catheter free	270	(94.7%)
2. Needed second sitting TURIS	15	(5.3%)
3. Haematuria necessitating blood transfusion	7	(2.4%)
4. Haematuria necessitating redo fulguration	3	(1.05%)
5. Fever (more than 100°c)	22	(7.71%)
6. TURP Syndrome	Nil	
7. Painful burning in urethra	106	(37.19%)
8. Stricture urethra	2	(0.70%)
9. Uro-sepsis	1	(0.35%)
10. Hospital Stay	1-4 days (mean 1.5 days)	
11. Duration of catheter	2-3 days (mean 2.5 days)	

**Complications and success rate of trans-urethral resection of prostate  
in saline (TURIS)  
(n=285)**

**DISCUSSION:**

The clinical efficiency and safety profile of monopolar TUR has notably improved over the years. Any technique that today aspires to become an alternative to TUR must be able to offer the patient the same results by reducing the risks associated with the use of the monopolar device (thermal lesions and faradic effect) and equally with the use of electrolyte-free irrigation solution (TUR syndrome). Starting

from these assumptions, several resectoscopes equipped with a bipolar resection technology were developed. Bipolar resection is theoretically safer because it excludes the patient from the electrical circuit and uses a physiological solution as an irrigant. The phase III comparative studies (monopolar vs. bipolar) demonstrated that both technologies have similar clinical results (8) but the bipolar device showed to have less intra and

postoperative complications resulting in a greater safety of use as, for example, the absence of TUR syndrome.

In a recent review of the literature Ho and Cheng (11) observed that in the majority of published papers the patients were treated with the PK system by Gyrus. Ho reports that this technology is capable of supplying identical clinical results to monopolar TUR in terms of resection time, bleeding, duration of catheterization, and hospital stay but with a greater rate of urethral strictures (6%). The author concludes by defining bipolar resection as being safer compared to monopolar (absence of TUR syndrome, slightly less blood loss, and absence of thermal lesions), and burdened with a greater incidence of urethral strictures (6%). These findings are little different from our study, we found more episodes of haematuria with this equipment and less stricture as compared to the study referred above. More important is the non-occurrence of TUR syndrome after bipolar resection in our study and other studies. (8) In 747 patients operated conventionally with the monopolar technique, 15 cases of TUR syndrome were reported (2%), which is acceptable when compared with the < 1 to 3% reported by Rassweiler et al. (9) In the bipolar study arms there were no cases after 760 resections. This observation is supported by Issa (10), who reviewed the literature on 468 bipolar resections and stated that the risk of TUR syndrome is thereby eliminated. There is no report of TUR syndrome with B-TURP in the literature. (12,13) These results are similar to our study.

Two the best of our knowledge this study represents the only currently available published data using the bipolar device equipment Autocon® 400 ESU in normal saline (0.9%). The resectoscope used was 26 FR (Karl Storz) loop = 24 FR size with continuous irrigation system.

If monopolar energy will be used, it is recommended to take precautions to prevent TUR syndrome such as avoiding extension of resection time (60 min), minimizing fluid pressure, and keeping the height of the fluid bag below 50 cm. A lot of work has reported that the bipolar system is reliable in terms of dilutional hyponatremia. (14,15)

In our series bipolar resection appears to be a safe procedure. In none of the 285 cases there was any TUR syndrome. Moreover, bipolar resection provides unremarkable clinical results in terms of duration of intervention, catheterization, and hospital stay time. Despite reduction in TUR syndrome with the use of bipolar techniques, one of the TURP complications is

bleeding, which is seen in 5% of cases. (14) Post operatively 7 patients (2.4%) developed haematuria necessitating blood transfusion and 3 patients (1.05%) needed redo fulguration. Two (0.7%) developed orchitis, none of the patients developed renal failure and TURP syndrome. Out of 285 patients 270 (94.7%) were catheter free. In long term follow up 2 (0.70%) patients developed stricture urethra and only 1 (0.35%) patient developed urosepsis whose urine culture was positive and procedure was done under antibiotic cover, he had chronic renal insufficiency and none patient developed bladder neck contracture during follow up.

#### CONCLUSION:

Our results demonstrate that TURIS is safe and efficacious in B.P.H patients with retention of urine with minimum morbidity and no mortality it avoids the risk of TURP syndrome but with more episodes of bleeding.

#### CONFLICT OF INTEREST:

None declared.

#### DISCLOSURE STATEMENT:

No competing financial interests exist.

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