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# Bipolar TURIS Resection of Large Prostates: The Experience of our Team

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## 1. Abstract

Bi polar TURIS resection of the prostate is a well-established method, used over the past two decades for the surgical therapy of benign prostate hyperplasia. According to the EAU guidelines it is best to be applied to prostate volumes from 30 to 80 cc and it is second choice for prostate volumes over 80cc. A retrospective study was conducted on 114 patients that underwent B-TURIS in a period of 5 years, with a prostate gland volume from 80 to 170 cc, performed by our team. Our objective was to evaluate the efficacy and safety of bipolar TUR is in patients with high-volume prostates. Herein, we present the results of our review. The procedure was successful as far as both the prostate volume reduction and the symptom score (IPSS) improvement as well. Besides, we have not marked any complications, apart from 1 patient that suffered from urinary tract infection after the operation.

## 2. Introduction

Benign prostatic hyperplasia (BPH) is a prevalent condition among aging males, often leading to lower urinary tract symptoms (LUTS). It is the leading cause of lower urinary tract symptoms (LUTS), even if these symptoms vary greatly from one individual to another. Large BPH is defined as having a volume ≥ 80 ml [1, 2]. Transurethral Resection of the Prostate (TURP) is a surgical procedure which consists of resecting the prostate in chips through urethra, using an endoscope and under visual control. Monopolar TURP (M-TURP) has long been considered as the reference technique for the surgical management of LUTS/BPO. However, in recent years various techniques have been developed with the aim of providing a safe and effective alternative to M-TURP. Bipolar TURP is the most widely investigated alternative to M-TURP [3, 4]. Bipolar TURP differs from traditional monopolar TURP by the use of a double electrode allowing electricity output to the generator and, therefore, the use of 0.9% physiological saline instead of glycocol. There is no risk of TURP syndrome [5]. Through a wide range of metanalysis performed it was concluded that TURis was of equivalent efficacy to M-TURP [4]. A quite recent systematic review and meta-analysis by Omar et al. [5] compared outcomes of monopolar versus bipolar TURP in moderate to large prostate volumes. The study found no significant difference in clinical efficacy between the two techniques at 3, 6, and 12 months postoperatively. However, bipolar TURP was associated with shorter hospital stays and catheterization durations, and a significantly lower incidence of TUR syndrome [6]. No cut off value about the prostate volume has been clearly proposed but the EAU guidelines consensus, suggested that the upper limit for M-B -TURP to be 80 mL (under the assumption that this limit depends on the surgeon's experience, choice of resectoscope size and resection speed) [4]. Our study aims to assess our team's experience with bipolar TUR is in managing high-volume prostates, focusing on functional outcomes and complication rates.

## 3. Methods

A retrospective cohort study was conducted. The study included 114 male patients with prostate volumes exceeding 80 cc who underwent bipolar TUR is between 2019 and 2024. The pre operation and the post operation prostate volume was measured by ultrasound. IPSS questionnaire tool was filled in before and 6 months after the operation by the patients to express the improvement of the symptoms and the QoL. We also examined the need for blood transfusion and whether there was a post operation urinary tract infection or any other complication reported via the Clavien – Dindo complication referral score. Exclusion criteria were a prior prostate surgery, prostate cancer diagnosis and neurogenic bladder disorders. All procedures were performed using the bipolar TUR is system under spinal or general anaesthesia. Resection was carried out until an adequate prostatic cavity was achieved. Paired t-tests assessed changes in Volume and IPSS. Chi-square tests evaluated associations between

categorical variables. A p-value < 0.05 was considered statistically significant. The database of our study is noted in Table 1. The aim of our study was to demonstrate the efficiency and safety of bipolar TUR is resection of the prostate in large volume prostates, over 80cc.

**Table 1**

| A/A | PRO V | POST V | PRO IPSS | POST IPSS | AGE | C/D | .TRANSF |
|---|---|---|---|---|---|---|---|
| 1 | 90 | 20 | 18 | 7 | 67 | 0 | 0 |
| 2 | 85 | 30 | 19 | 8 | 75 | 0 | 0 |
| 3 | 115 | 35 | 22 | 11 | 63 | 0 | 0 |
| 4 | 120 | 25 | 16 | 6 | 61 | 0 | 0 |
| 5 | 95 | 20 | 22 | 9 | 72 | 0 | 0 |
| 6 | 130 | 30 | 21 | 10 | 68 | 0 | 0 |
| 7 | 100 | 24 | 17 | 5 | 61 | 0 | 0 |
| 8 | 110 | 32 | 16 | 9 | 63 | 0 | 0 |
| 9 | 85 | 20 | 17 | 3 | 59 | 0 | 0 |
| 10 | 140 | 40 | 22 | 9 | 69 | 0 | 0 |
| 11 | 105 | 30 | 18 | 7 | 71 | 0 | 0 |
| 12 | 98 | 21 | 15 | 6 | 61 | 0 | 0 |
| 13 | 85 | 20 | 17 | 8 | 63 | 0 | 0 |
| 14 | 130 | 35 | 24 | 10 | 67 | 0 | 0 |
| 15 | 120 | 27 | 21 | 9 | 70 | 0 | 0 |
| 16 | 145 | 40 | 25 | 10 | 66 | 0 | 0 |
| 17 | 95 | 22 | 18 | 6 | 63 | 0 | 0 |
| 18 | 86 | 21 | 16 | 4 | 67 | 0 | 0 |
| 19 | 114 | 27 | 18 | 7 | 80 | 0 | 0 |
| 20 | 105 | 29 | 22 | 9 | 76 | 0 | 0 |
| 21 | 112 | 32 | 17 | 8 | 73 | 0 | 0 |
| 22 | 105 | 31 | 21 | 7 | 69 | 0 | 0 |
| 23 | 95 | 26 | 19 | 8 | 64 | 0 | 0 |
| 24 | 110 | 28 | 23 | 6 | 60 | 0 | 0 |
| 25 | 102 | 34 | 20 | 7 | 78 | 2 | 0 |
| 26 | 86 | 22 | 17 | 3 | 64 | 0 | 0 |
| 27 | 97 | 27 | 21 | 5 | 73 | 0 | 0 |
| 28 | 100 | 25 | 20 | 7 | 71 | 0 | 0 |
| 29 | 119 | 31 | 26 | 8 | 75 | 0 | 0 |
| 30 | 130 | 36 | 24 | 5 | 72 | 0 | 0 |
| 31 | 103 | 28 | 20 | 7 | 65 | 0 | 0 |
| 32 | 87 | 26 | 17 | 5 | 61 | 0 | 0 |
| 33 | 92 | 21 | 21 | 3 | 59 | 0 | 0 |
| 34 | 125 | 26 | 24 | 8 | 71 | 0 | 0 |
| 35 | 140 | 37 | 20 | 10 | 70 | 0 | 0 |
| 36 | 82 | 14 | 17 | 0 | 62 | 0 | 0 |
| 37 | 95 | 22 | 18 | 3 | 60 | 0 | 0 |
| 38 | 100 | 27 | 19 | 7 | 76 | 0 | 0 |
| 39 | 108 | 30 | 21 | 9 | 71 | 0 | 0 |
| 40 | 97 | 26 | 19 | 6 | 82 | 0 | 0 |
| 41 | 128 | 32 | 25 | 10 | 57 | 0 | 0 |
| 42 | 88 | 22 | 16 | 6 | 74 | 0 | 0 |
| 43 | 96 | 28 | 17 | 8 | 83 | 0 | 0 |
| 44 | 127 | 31 | 22 | 3 | 63 | 0 | 0 |
| 45 | 122 | 39 | 21 | 10 | 68 | 0 | 0 |
| 46 | 145 | 40 | 24 | 9 | 71 | 0 | 0 |
| 47 | 120 | 29 | 22 | 7 | 69 | 0 | 0 |
| 48 | 150 | 36 | 20 | 8 | 65 | 0 | 0 |
| 49 | 95 | 30 | 17 | 5 | 74 | 0 | 0 |
| 50 | 82 | 17 | 16 | 3 | 77 | 0 | 0 |
| 51 | 125 | 29 | 19 | 4 | 72 | 0 | 0 |
| 52 | 88 | 20 | 16 | 2 | 60 | 0 | 0 |
| 53 | 82 | 17 | 18 | 0 | 59 | 0 | 0 |
| 54 | 115 | 26 | 24 | 4 | 61 | 0 | 0 |
| 55 | 170 | 40 | 25 | 7 | 64 | 0 | 0 |
| 56 | 96 | 31 | 18 | 6 | 76 | 0 | 0 |
| 57 | 110 | 32 | 20 | 6 | 81 | 0 | 0 |
| 58 | 95 | 23 | 19 | 3 | 78 | 0 | 0 |
| 59 | 81 | 16 | 14 | 1 | 62 | 0 | 0 |
| 60 | 137 | 39 | 22 | 6 | 65 | 0 | 0 |
| 61 | 94 | 29 | 20 | 5 | 63 | 0 | 0 |
| 62 | 89 | 30 | 19 | 5 | 75 | 0 | 0 |
| 63 | 100 | 33 | 21 | 7 | 76 | 0 | 0 |
| 64 | 92 | 27 | 16 | 4 | 79 | 0 | 0 |
| 65 | 127 | 29 | 25 | 7 | 71 | 0 | 0 |
| 66 | 86 | 30 | 16 | 4 | 58 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 67 | 82 | 21 | 15 | 1 | 55 | 0 | 0 |
| 68 | 107 | 32 | 20 | 5 | 63 | 0 | 0 |
| 69 | 112 | 28 | 19 | 7 | 77 | 0 | 0 |
| 70 | 95 | 32 | 15 | 6 | 82 | 0 | 0 |
| 71 | 140 | 40 | 24 | 10 | 71 | 0 | 0 |
| 72 | 105 | 33 | 21 | 7 | 70 | 0 | 0 |
| 73 | 96 | 28 | 18 | 6 | 80 | 0 | 0 |
| 74 | 117 | 32 | 17 | 7 | 73 | 0 | 0 |
| 75 | 89 | 22 | 18 | 4 | 67 | 0 | 0 |
| 76 | 120 | 33 | 23 | 10 | 59 | 0 | 0 |
| 77 | 105 | 28 | 19 | 7 | 63 | 0 | 0 |
| 78 | 100 | 30 | 15 | 6 | 68 | 0 | 0 |
| 79 | 85 | 22 | 16 | 3 | 57 | 0 | 0 |
| 80 | 81 | 16 | 15 | 1 | 64 | 0 | 0 |
| 81 | 80 | 19 | 20 | 3 | 77 | 0 | 0 |
| 82 | 95 | 32 | 16 | 6 | 84 | 0 | 0 |
| 83 | 110 | 28 | 22 | 8 | 79 | 0 | 0 |
| 84 | 132 | 38 | 23 | 10 | 72 | 0 | 0 |
| 85 | 105 | 27 | 18 | 8 | 68 | 0 | 0 |
| 86 | 93 | 24 | 17 | 4 | 63 | 0 | 0 |
| 87 | 88 | 26 | 17 | 5 | 81 | 0 | 0 |
| 88 | 101 | 32 | 20 | 8 | 75 | 0 | 0 |
| 89 | 107 | 28 | 23 | 7 | 70 | 0 | 0 |
| 90 | 87 | 26 | 18 | 5 | 63 | 0 | 0 |
| 91 | 120 | 32 | 25 | 4 | 64 | 0 | 0 |
| 92 | 117 | 26 | 20 | 3 | 68 | 0 | 0 |
| 93 | 104 | 21 | 23 | 6 | 76 | 0 | 0 |
| 94 | 100 | 25 | 22 | 5 | 77 | 0 | 0 |
| 95 | 90 | 17 | 17 | 2 | 79 | 0 | 0 |
| 96 | 114 | 30 | 20 | 6 | 68 | 0 | 0 |
| 97 | 122 | 39 | 23 | 9 | 73 | 0 | 0 |
| 98 | 92 | 22 | 18 | 3 | 77 | 0 | 0 |
| 99 | 119 | 23 | 19 | 4 | 78 | 0 | 0 |
| 100 | 103 | 31 | 17 | 5 | 68 | 0 | 0 |
| 101 | 109 | 33 | 22 | 7 | 74 | 0 | 0 |
| 102 | 94 | 25 | 18 | 5 | 68 | 0 | 0 |
| 103 | 120 | 36 | 23 | 9 | 71 | 0 | 0 |
| 104 | 88 | 21 | 16 | 4 | 65 | 0 | 0 |
| 105 | 135 | 37 | 25 | 10 | 66 | 0 | 0 |
| 106 | 108 | 28 | 20 | 6 | 73 | 0 | 0 |
| 107 | 97 | 24 | 18 | 3 | 60 | 0 | 0 |
| 108 | 125 | 34 | 22 | 8 | 76 | 0 | 0 |
| 109 | 90 | 22 | 17 | 2 | 58 | 0 | 0 |
| 110 | 12 | 29 | 21 | 6 | 70 | 0 | 0 |
| 111 | 100 | 27 | 19 | 5 | 67 | 0 | 0 |
| 112 | 116 | 32 | 24 | 9 | 69 | 0 | 0 |
| 113 | 84 | 20 | 16 | 3 | 78 | 0 | 0 |
| 114 | 108 | 31 | 20 | 6 | 75 | 0 | 0 |

## 4. Results

About the patient demographics, the mean age was 69.28 ± 6.91 years. As far as the functional outcomes are concerned, the gland volume decreased from 105.06 ± 19.90 ml preoperatively to 28.02 ± 6.06 ml postoperatively ($p < 0.001$) and the IPSS score which was used to demonstrate the QoL of the patients was improved from 19.60 ± 2.90 to 6.04 ± 2.50 postoperatively ($p < 0.001$). No cases of TUR syndrome were reported. Minimal intraoperative bleeding observed; none required transfusion. 1 patient suffered from post operation urinary tract infection, requiring intravenous antibiotics, Clavien – Dindo 2 referral system score.

## 5. Discussion

Benign prostatic hypertrophy affects 50% of men aged over 50 years. Its prevalence increases gradually with age; 90% of men over 80 years old are affected. Benign prostatic hyperplasia (BPH) is a leading cause of bladder outlet obstruction (BOO) in men, with transurethral resection of the prostate (TURP) historically regarded as the gold standard for surgical management. While other minimally invasive surgical therapies have emerged and enucleation procedures have advanced, both demonstrating good functional outcomes and fewer complications, TURP remains widely practiced due to its proven efficacy, easy availability, cost effectivity and important part of urological training. However, TURP has limitations, according to the EAU and AUA guidelines including its size dependency and unsuitability for patients treated with anti-platelet agents, mostly because of the reviews and metanalysis samples that were obtained at the researches worldwide [8-11]. Bipolar transurethral resection has been developed in recent years to minimize current flow absorbed by the patient. This method is characterized by the placement of the neutral electrode in the right proximity of the conductive electrode. Since the irrigation solution (saline) produces extremely lower resistance than the one of tissues, a direct flow of current from the active electrode to the neutral electrode would

occur when producing energy [5]. The lack of Tur syndrome in the bipolar TURP is well studied and proved. Although BTURP has proven to be efficient in prostate gland with volumes under 80cc, it is recommended in larger prostate volumes as second choice procedure. The lack of studies in greater volumes is one of the reasons that resulted in this recommendation. In the last 5 years there has been an interest in the use of the Turis technique in large prostates and new studies and are being conducted, confirming the realibility and safety of the procedure [6,7,11,12,13]. Last but not least it should be mentioned that managing benign prostatic hyperplasia (BPH) in patients with prostate volumes exceeding 80 cc presents unique surgical challenges. The purpose our study was to contribute with our experience and the results that arose to direct the use of this method with safety to greater gland volumes.

A study by Mamdoh et al. (2021) focused on prostates larger than 100 grams, reporting that bipolar TURP led to significant improvements in IPSS, Qmax, and post-void residual urine volumes at both 1 and 12 months postoperatively [7]. Also, as abovementioned, Omar et al (2020) conducted a systematic review and meta-analysis that compared outcomes of monopolar versus bipolar TURP in moderate to large prostate volumes. The study found no significant difference in clinical efficacy between the two techniques at 3, 6, and 12 months postoperatively. However, bipolar TURP was associated with shorter hospital stays and catheterization durations, and a significantly lower incidence of TUR syndrome. In our study, between 114 patients with prostate volume over 80cc, significant improvements were observed postoperatively. The postoperative volume decreased from a mean 105.06cc to 28.02 cc. Also, the IPSS score decreased from a mean 19.06 to 6.02. No need of blood transfusion was observed, which is a significant note in large volume prostates being resected and only one postoperative infection was noted. Our findings align with existing literature suggesting that bipolar TUR is is a safe and effective modality for managing large prostate volumes. The significant improvements in urinary parameters and low complication rates underscore its utility in such cases.

## 6. Conclusion

Benign prostate hyperplasia is a leading cause of bladder outlet obstruction worldwide. While novel technology and methods gain role at the surgical treatment, bipolar Turis remains the cornerstone of the surgical therapy. It is more and more applied to larger prostate volumes and our study confirms the existing data and contributes to empowering the opinion that it is a safe and efficient procedure for resecting gland volume over 80cc, along with the surgeon's experience.

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