

Assessment of Complications of Transurethral Resection of the Prostate Using Clavien-Dindo Classification in South Eastern Nigeria

Timothy Uzoma Mbaeri, Joseph Amauzo Abiahu, Emmanuel Ahuizechukwu Obiesie, Chinonso Odo, Kingsley Chidi Oranusi, Alexander Maduaburochukwu Ekwunife Nwofor, Jideofor Chukwuma Orakwe

Department of Surgery,
Nnamdi Azikiwe
University, Nnewi Campus,
Anambra State, Nigeria

Submitted: 02-Mar-2020
Revised : 06-May-2020
Accepted : 04-Jun-2020
Published : 27-Jul-2020

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the most common diseases in aging men. In the 4th decade of life, BPH has a prevalence of 30%–40%, rising to 70%–80% in those older than 80 years.^[1]

Clinically, BPH manifests as lower urinary tract symptoms. These consists of filling phase (urgency, frequency, nocturia, and urgency incontinence) and voiding phase symptoms (hesitancy, weak stream, straining, intermittency, and feeling of incomplete bladder emptying).^[2] Prolonged untreated obstruction may lead to complications such as recurrent urinary tract infections, recurrent hematuria, bladder stones formation, acute urinary retention, chronic urinary retention, and renal impairment.^[3]

ABSTRACT **Background:** Benign prostatic hyperplasia is one of the most common diseases in aging males. For men that need surgical treatment, transurethral resection of the prostate (TURP) is the gold standard. The aim of this article is to retrospectively review the complications of TURP over a 3-year period in Nnamdi Azikiwe University Teaching Hospital Nnewi and a Specialist Urology Center in Awka all in Anambra South-East Nigeria using Clavien-Dindo classification. **Patients and Methods:** The study was a retrospective review of consecutive TURPs done over a 3-year period. Patients' information and complications arising from the procedure were collected and graded using the Clavien-Dindo classification with a pro forma designed for the study and analyzed with the Statistical Package for the Social Sciences software version 20.0. **Results:** Ninety-seven patients had TURP during the period of this study. Twenty-nine complications were noted in 24 patients. The postoperative morbidity rate was 24.74%, and no mortality was recorded. Most of the complications were grade 2 (55%), followed by grade 1 and 3 (20.69%) each. Grade 4a complication accounted for only 3.45%. No grade 5 complication was recorded. **Conclusion:** TURP is safe, with minimal life-threatening morbidity even in a resource-poor economy where TURP is gradually gaining grounds.

KEYWORDS: Clavien-Dindo, complication, transurethral resection of the prostate

Management strategies for symptomatic BPH include watchful waiting with lifestyle modification, medical treatment, and surgery. Surgical therapy is reserved for patients that have failed medical therapy, those with severe symptoms and poor quality of life (QOL) score as well as those who have developed complications. For men who require surgical treatment, transurethral resection of the prostate (TURP) remains the gold standard.^[4] TURP has been linked with a 120% increase in urine flow and is also known to increase the maximal urine flow rate (Qmax) by 9.7 ml/s.^[5,6] International

Address for correspondence: Dr. Timothy Uzoma Mbaeri, Department of Surgery, Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria.
E-mail: Uzomambaeri@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Mbaeri TU, Abiahu JA, Obiesie EA, Odo C, Oranusi KC, Nwofor AME, et al. Assessment of complications of transurethral resection of the prostate using Clavien-Dindo classification in South Eastern Nigeria. Niger J Surg 2020;26:142-6.

Access this article online	
Quick Response Code: 	Website: www.nigerianjsurg.com
	DOI: 10.4103/njs.NJS_20_20

prostate symptoms score and QOL indicators are improved by 70.6% following this procedure.^[6]

With advancing technology in the microprocessor processing unit, video transurethral resection (TUR), bipolar resection in saline and training, the complications of TURP has reduced.^[7] However, as is with most surgical procedures, TURP is not without complications.^[7] A prospective multicenter study showed mortality rate of 0.1% and a perioperative morbidity rate of 11.1%.^[8] This is significant and therefore represent an important concern.

Mitropoulus *et al.*^[9] in a systematic review of reporting and grading of complications after urologic surgical procedures noted that Clavien-Dindo classification system (CDCS) [Table 1] is a simple, reliable, and validated tool for assessing complications and thus recommended this classification system for urological complication among other grading systems considered. With a uniform system of grading, different centers and regions can objectively compare their complications.

The aim of this article is to retrospectively review the complications of TURP done over a 3-year period in our centers in South-East Nigeria using the Clavien-Dindo classification.

PATIENTS AND METHODS

This is a retrospective review of all the complications in all patients subjected to TURP for BPH at 2 facilities,

Table 1: Clavien-Dindo classification system

Grade	Component
1	A any deviation from the normal postoperative course without the need for Pharmacological treatment or surgical, endoscopic, and radiological interventions. Acceptable therapeutic regimens are: drugs as antiemetics, antipyretics, analgesics, diuretics and electrolytes, and physiotherapy This grade also includes wound infections opened at the bedside
2	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions, antibiotics, and total parenteral nutrition are also included
3	Requiring surgical, endoscopic, or radiological intervention
3a	Intervention under regional/local anesthesia
3b	Intervention under general anesthesia
4	Life-threatening complications requiring intensive care/intensive care unit management
4a	Single-organ dysfunction
4b	Multi-organ dysfunction
5	Patient demise

Nnamdi Azikiwe University Teaching Hospital in Nnewi and a Specialist Urology Center in Awka all in Anambra State South-East Nigeria between May 2016 and April 2019. Ethical approval was obtained for the study. Those with an incidentally discovered prostate cancer following the procedure were excluded. Follow-up period ranged from 6 to 36 months.

All operations were performed using a size 26F continuous flow resectoscope and monopolar electrosurgical unit with diathermy settings of 125 and 60 W for Cutting and Coagulation respectively. Resection was preceded by instilling 10 ml of KY-jelly into the urethra and calibrating the urethra with Otis urethrotome to 30 Ch after which another 30 ml was instilled for the procedure. Intraoperative irrigation fluid was 5% dextrose water at a height of 60 ml above the symphysis pubis, whereas normal saline was used postoperatively for bladder irrigation. All operations were performed by a single consultant urologist under spinal anesthesia. At the end of the surgery, a 3-way size 24F all silicone catheter was passed and continuous irrigation with normal saline commenced. Irrigation was stopped when the effluent became clear and catheter removed 24 h later. Patients were discharged when they no longer had hematuria and were deemed fit for discharge.

Patients' data (mean age of patients, prostate-specific antigen, prostate volumes, resected weight, operation time, hospital stay, and number of patients on catheter) and complications were retrieved from the patients' folder detailing the operation note, inpatient note, and follow-up documentations. All complications occurring from the perioperative period to at least 6 months postoperative were retrieved and all data recorded in a pro forma designed for the study.

Two of the authors different from the operating surgeon then graded the complications (independently) using the CDCS as detailed in Table 1 to remove the surgeon's bias. A difference in grading between the two authors was to be resolved by a discussion between them. Simple descriptive statistics was done using the IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.

RESULTS

Ninety-seven patients had TURP for BPH during the period of this study, with a mean age of 69.26 ± 10.46 years. The characteristics of the patients are shown in Table 2.

A total of 29 complications were noted in 24 patients meaning the overall complication rate was 24.74%.

Twenty-seven complications occurred within the 1st month postoperation and 2 complications were recorded at 3 and 9 months of operation. No mortality was recorded during the follow-up period. These complications were classified according to CDCS, as shown in Table 3. The classifications by the two authors who did the grading were the same.

Of the 29 complications, Grade 1 accounted for 6 (20.7%), Grade 2 accounted for 16 (55.2%), Grade 3a accounted for 6 (20.7%), and Grade 4b accounted for 1 (3.4%) [Table 4].

DISCUSSION

The mean age of patients in our study is 69.26 ± 10.46 . This is similar to the mean age in related studies which reported mean ages of 66.1, 65 ± 5.8 , 67.2, 66.1 ± 8.6 , and 67.07 ± 9.38 among patients with benign prostate hyperplasia in Nigeria.^[10-14] It is also similar to the mean ages of similar studies done in the UK (70 years), Greece (68.4 years), India (66.94 years), and Italy (70.1 years).^[5,15-17]

Table 2: Patient Pre and Post-Op Characteristics

Parameter	n
Total number of patients	97
Number of patient with catheter before surgery, n (%)	68 (70.1)
Mean age (years)	69.26±10.46
Median PSA (ng/ml)	6.70
Mean prostate volume (ml)	97.43±43.74
Resected weight (gram)	33.84±20.87
Operation time (min)	69.47±22.29
Hospital stay (days)	3.7629±2.90

PSA: Prostate-specific antigen

The complications that can arise from TURP have been extensively documented in a number of studies.^[7,8,11,18-20] The main aim of this study is to audit the complications arising in men who had TURP in a developing economy where TURP is beginning to gain popularity using a validated classification system, CDCS. This is important for proper planning, patients counseling, and comparing results.

In this study, the overall complication rate was 24.74% which is within the range of the overall complication rate in studies that used same CDCS (9.1%–34.4%).^[5,15-17] Stroma *et al.*^[5] recorded an overall complication rate of 9.1% which is low compared to our work. This could be attributed to under reporting of lower-grade complications (Grade 1 and 2) that might have been managed by the general practitioners to which these patients were referred back to after TURP. Furthermore, they followed up these patients for only 2 months as against our work where we followed them up for a minimum of 6 months. The first stricture was only noticed from the 3rd month postsurgery.

Furthermore, Mamoulakis *et al.*^[15] had an overall complication rate of 15.7% which is still low compared to what we got in our study. Comparing the characteristics of his patient with ours, we noted more of our patients were on urethral catheter before surgery (70.1% vs. 19.7%) and our preoperative mean prostate sizes were higher (97.4 g vs. 54 g). These are the factors that have been shown to affect the complication rates negatively in other studies.^[7,21,22]

Agrawal *et al.*^[16] recorded an overall complication rate of 34.4% which is higher than what we reported. However, looking at his list of complications, we

Table 3: Clavien-Dindo grading of complications as seen in patients who had transurethral resection of the prostate and the treatments given

Grade	Complications, number of patients that developed the complications	Treatment offered
1	Hematuria (secondary hemorrhage) (n=2)	Bedside bladder washout, catheter traction and continuous bladder irrigation with normal saline
	Failed trial without catheter (n=2)	Recatheterization for 1 week
	Stress incontinence (n=2)	Pelvic floor muscle exercise
2	Epididymorchitis (n=5)	Analgesics and antibiotics
	Primary hemorrhage that required blood transfusion (n=11)	Blood transfusion
3a	Hematuria (secondary hemorrhage) (n=2)	Blood transfusion, cystoscopy, and coagulation of bleeding vessels (spinal anesthesia)
	Urethral stricture (n=2)	DVIU done
	Failed trial without catheter (n=2)	Cystoscopy with re-resection of residual apical tissue
3b	Nil	
4a	Nil	
4b	TURP syndrome (n=1)	Diuretics, fluid restrictions, normal saline, diazepam, and intensive care monitoring
5	Nil	

DVIU: Direct visual internal urethrotomy, TURP: Transurethral resection of the prostate

Table 4: Complications, percentages, and Clavian-Dindo classifications

Complication	<i>n</i>	Percentage of total complication	Percentage of total patients	Clavian-Dindo classification
Hematuria requiring washout and irrigation	2	6.9	2.1	1
Failed trial without catheter	2	6.9	2.1	1
Stress urinary incontinence	2	6.9	2.1	1
Epididymorchitis	5	17.2	5.2	2
Primary hemorrhage requiring transfusion	11	37.9	11.3	2
Hematuria requiring operative intervention	2	6.9	2.1	3a
Urethral stricture	2	6.9	2.1	3a
Failed trial without catheter requiring resection of residual apical tissue	2	6.9	2.1	3a
TURP syndrome	1	3.4	1.0	4a
Total	29	100		

TURP: Transurethral resection of the prostate

noted they classified transient postoperative hematuria as a complication. Transient hematuria is normally in TURP patients in the immediate postoperative period and should not be classified as a complication except that which requires blood transfusion or going back to theater for clot evacuation and/or coagulation. If their patients required this intervention, it was not stated. Second, prostate chip blockade of catheter should not be classified as a complication as it could happen post-TURP and is usually resolved by gentle manipulation of the catheter. We think these would have led to the higher complication rate recorded in their study.

In the grade by grade complications, our study showed the most common grade complication was grade 2 as against similar studies which had more of grade 1 complications.^[5,15-17] A closer look at the actual complications under grade 2 in our study will show it is more of perioperative hematuria requiring blood transfusion (which was our most common complication) and epididymorchitis which can be accounted for by the preponderance of people on urethral catheter before surgery, bigger prostate sizes, and the learning curve in a place where TURP is just starting.^[7,21-23] The transfusion rate of 11.34% observed in our study is higher than the transfusion rate ranging from 0.4% to 8.6% observed in developed countries,^[7,20,24] but lower than 40% reported by an earlier study in our region.^[11] Our transfusion rate, however, dropped with increasing experience and confidence with the procedure.

We also noticed a similarity in the array of complications in each grade in all the studies that used the Clavian-Dindo classification of their complications.

Four patients (4.12%) developed hematuria 7 days after the procedure. Two of these patients responded to bladder washout, catheter traction, and irrigation with

normal saline (Clavien-Dindo 1), whereas the other two required cystoscopy for clot evacuation and cauterization of bleeding vessels (Clavien-Dindo 3a).

Four patients (4.12%) failed trial without catheter (TWOC) after the surgery. Two of these patients were successfully managed with only re-catheterization for 1 week (Clavien-Dindo 1). This complication may have arisen from detrusor dysfunction that accompanies BPH.^[7,25] The other two patients still failed TWOC after 1 week of re-catheterization. They had cystoscopy and resection of residual apical tissue and voided successfully afterward (Clavien-Dindo 3a). This retention rate of 4.12% compares favorably with the rates of 1%–4.6% reported by other authors.^[11,12,19]

Two patients (2.06%) developed severe stress urinary incontinence. One of the patient recovered continence after 6 months; however, the second patient improved markedly, but still has some degree of stress incontinent till date (Clavien-Dindo 1). The mechanism of incontinence has been proposed to be due to injury to the proximal part of the voluntary urinary sphincter.^[7] This rate of incontinence is comparable to the rates reported by other authors in our environment (0.6%–2%) and much less than that reported by a systematic review which put incontinence rate at 8.4%.^[11,12,26]

Two patients (2.06%) developed urethral stricture at 3 and 9 months, respectively. Both were short-segment strictures and were located at the bulbar urethra and the bulbo-membranous junction, respectively. They were both treated successfully with direct visual internal urethrotomy. Some authors have reported a stricture rate of 2.2%–9.8%.^[7,19] Our stricture rate may have been low due to our use of continuous flow resectoscope (therefore avoiding frequent withdrawal of the instrument to decompress the bladder), routine calibration by otis urethrotomy to 30FG, as well as generous lubrication of the urethra.^[7]

One patient (1.03%) developed TUR syndrome (Clavien-Dindo 4b). This was noted about 36 h postoperatively (longer than expected from the literature)^[27,28] when the patient developed nausea, vomiting, headache, hypertension, and confusion. Serum sodium concentration was 107.7 mmol/L. TUR syndrome rate of 1.03% compares favorably with rates in developed countries (<1%–2.1%) and is slightly better than 4.6% reported in an earlier study in our region.^[11,19,24,29] Factors that may have led to the development of TURS in this patient include a large prostate volume of 162 ml, capsular perforation, and a relatively long resection time of 82 min.

CONCLUSION

TURP is safe, with minimal life-threatening morbidity which improved as the surgeon gains experience and expertise.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Madersbacher S, Sampson N, Culig Z. Pathophysiology of benign prostatic hyperplasia and benign prostatic enlargement: A mini-review. *Gerontology* 2019;65:458-64.
- Miller J, Tarter TH. Combination therapy with dutasteride and tamsulosin for the treatment of symptomatic enlarged prostate. *Clin Interv Aging* 2009;4:251-8.
- Curtis NJ. BPH: Costs and treatment outcomes. *AMJ Manag Care* 2006;12:141-8.
- Reich O, Gratzke C, Stief CG. Techniques and long-term results of surgical procedures for BPH. *Eur Urol* 2006;49:970-8.
- Stroman L, Ellis D, Toomey R, Mazaris E. An 18-month audit of TURP complications using the Clavien-Dindo classification system. *Austin J Urol* 2014;1:3-6.
- Madersbacher S, Marberger M. Is transurethral resection of the prostate still justified? *BJU Int* 1999;83:227-37.
- Rassweiler J, Teber D, Kuntz R, Hofmann R. Complications of transurethral resection of the prostate (TURP)–incidence, management, and prevention. *Eur Urol* 2006;50:969-79.
- Reich O, Gratzke C, Bachmann A, Seitz M, Schlenker B, Hermanek P, *et al.* Morbidity, mortality and early outcome of transurethral resection of the prostate: A prospective multicenter evaluation of 10,654 patients. *J Urol* 2008;180:246-9.
- Mitropoulos D, Artibani W, Graefen M, Remzi M, Roupret M, Truss M, *et al.* Reporting and grading of complications after urological surgical procedures: An adhoc EAU guidelines Panel assessment and recommendations. *Eur Urol* 2012;612:341-9.
- Dawan D, Rafindadi AH, Kalayi GD. Benign prostate hyperplasia and prostate cancer in native Africans. *BJU Int* 2000;85:1074-7.
- Chukwujama NO, Oguike T, Azike J. Transurethral resection of the prostate: A 3 year experience. *Niger J Surg* 2011;17:15-8.
- Alhasan SU, Aji SA, Mohammed AZ, Malami S. Transurethral resection of the prostate in Northern Nigeria, problems and prospects. *BMC Urol* 2008;8:18.
- Nnabugwu II, Ugwumba FO, Udeh EI, Ozoemena OF. Learning transurethral resection of the prostate: A comparison of the weight of resected specimen to the weight of enucleated specimen in open prostatectomy. *Niger J Clin Pract* 2017;20:1590-5.
- Akpayak IC, Shuaibu SI, Onoma VE, Nabasu LE, Galam ZZ. Monopolar transurethral resection of the prostate for benign prostate hyperplasia: What are the outcomes and complication in our patients? *Niger J Med* 2017;26:173-7.
- Mamoulakis C, Efthimiou I, Kazoulis S, Christoulakis I, Sofra F. The modified Clavien classification system: A standardized platform for reporting complications in transurethral resection of the prostate *World J Urol* 2011;29:205-10.
- Agrawal M, Kumar M, Pandey S, Aggarwal A, Sankhwar S. Changing profiles of patients undergoing transurethral resection of the prostate over a decade: A single-center experience. *Urol Ann* 2019;11:270-5.
- Palmisano F, Boeri L, Fontana M, Gallioli A, De Lorenzis E, Zanetti SP, *et al.* Incidence and predictors of readmission within 30 days of transurethral resection of the prostate: A single center European experience. *Sci Rep* 2018;8:6575.
- Teo JS, Lee YM, Ho HS. An update on transurethral surgery for benign prostatic obstruction. *Asian J Urol* 2017;4:195-8.
- Al- Hammouri F, Abu-Qamar A. Monopolar transurethral resection of the big prostate, experience at Prince Hussein Bin Abdullah Urology Centre. *J Pak Med Assoc* 2011;61:628-31.
- Mebust WK, Holtgrewe HL, Cockett AT, Peters PC. Writing committee, the American Urological Association Transurethral prostatectomy immediate and postoperative complications. Cooperative study of 13 participating institutions evaluation of 3885 patients. *J Urol* 1989;144:243-7.
- Liu CC, Huang SP, Chou YH, Wang CJ, Huang CH. Current indications for transurethral resection of the prostate and associated complications. *Kaohsiung J Med Sci* 2003;19:49-54.
- Uchida T, Otori M, Soh S, Sato T, Iwamura M, Ao T, *et al.* Factors influencing morbidity in patients undergoing transurethral resection of the prostate. *Urology* 1999;53:98-105.
- Cumpanas AA, Botoca M, Bucuras V, Claiici D, Boiborean P, Miclea F, *et al.* The learning curve in transurethral resection of prostate (TURP) – The experience of eight young urologists during a six-years period. *Timisoara Med J* 2004;54:159-63.
- Marszalek M, Ponholzer A, Pusman M, Berger I. Transurethral resection of the prostate. *Eur Urol Suppl* 2009;8:504-5.
- Djavan B, Madersbacher S, Klingler C, Marberger M. Uro-dynamic assessment of patients with acute urinary retention: Is treatment failure after prostatectomy predictable? *J Urol* 1997;158:1829-33.
- Palaniappan S, Kuo TL, Cheng CW, Foo KT. Early outcome of transurethral enucleation and resection of the prostate versus transurethral resection of the prostate. *Singapore Med J* 2016;57:676-80.
- Swaminathan R, Tormey WP. Fluid absorption during transurethral prostatectomy. *Br Med J* 1981;282:317.
- Gravenstein D. Transurethral resection of the prostate (TURP) syndrome: A review of the pathophysiology and management. *Anesth Analg* 1997;84:438-46.
- Lin MS, Wu JC, Hsieh HL, Lin TC, Chen CC, Lin E. Comparison between monopolar and bipolar TURP in treating benign prostatic hyperplasia: 1 year report. *Mid Taiwan J Med* 2006;11:143-8.