

COMPARISON OF BLEEDING COMPLICATIONS BETWEEN TURP AND OPEN PROSTATECTOMY IN PATIENT WITH BPH

¹Ancelia Limantara, ²Doddy M. Soebadi, ³MPBudyandini D. Pramesti, ²Fikri Rizaldi.

¹Faculty of Medicine/Universitas Airlangga, Surabaya.

¹Department of Urology, Faculty of Medicine/Universitas Airlangga, Soetomo General Hospital, Surabaya.

³Department of Biomedic, Faculty of Medicine/Universitas Airlangga, Soetomo General Hospital, Surabaya.

ABSTRACT

Objective: Benign prostatic hyperplasia (BPH) is the enlargement of prostate glands. Two commonly used methods of BPH surgery in Indonesia are transurethral resection of prostate (TURP) and open prostatectomy. International studies have shown both methods have bleeding complications, occurring in 7% in TURP and 22% in open prostatectomy. But, only few researches for bleeding during BPH surgery are done in Indonesia. This study aimed to analyze the difference in bleeding complications between TURP and open prostatectomy in Indonesia. **Material & Methods:** An observational study with cross-sectional design, using consecutive sampling from medical records of patients above 21 years old with BPH who came to Poli Urologi Soetomo Hospital in 2015–2016 for TURP or open prostatectomy. Data were analyzed using Fischer and Mann-Whitney. **Results:** Information was obtained from 62 patients, TURP was done in 49 patients (79.03%) and 13 patients (26.53%) in which had bleeding complication. Open prostatectomy was done in 13 patients (20.97%) and 6 patients (46.15%) in which had bleeding complications. Fischer test showed no significant difference in bleeding complications between TURP and open prostatectomy in patients with BPH ($p=0.192$), including patients with urine retention ($p=0.451$), without urine retention ($p=0.249$), age below 70 ($p=0.140$) and above 70 ($p=1$). Mann-Whitney test showed significant difference in bleeding complications volume between TURP and open prostatectomy ($p=0.012$). **Conclusion:** There was no significant difference in bleeding complications between TURP and open prostatectomy in patients with BPH. But, between TURP and open prostatectomy significant difference in bleeding volume was found.

Keywords: Benign prostatic hyperplasia, transurethral resection of prostate, open prostatectomy, bleeding complications, cross-sectional.

ABSTRAK

Tujuan: Benign prostatic hyperplasia (BPH) adalah pembesaran kelenjar prostat. Di Indonesia, terdapat dua metode pembedahan BPH yang sering dilakukan, yaitu transurethral resection of prostate (TURP) dan open prostatectomy. Studi internasional menunjukkan kedua metode tersebut mempunyai komplikasi perdarahan, 7% pada TURP dan 22% pada open prostatectomy. Namun, hanya beberapa studi di Indonesia yang meneliti komplikasi perdarahan akibat pembedahan BPH. Studi ini bertujuan untuk menganalisis perbedaan komplikasi perdarahan pada TURP dan open prostatectomy pada pasien dengan BPH di Indonesia. **Bahan & Cara:** Studi ini merupakan studi observasional dengan desain cross-sectional, menggunakan teknik sampling consecutive dari rekam medis pasien BPH berusia minimal 21 tahun yang datang ke Poli Urologi RSUD Dr. Soetomo pada 2015-2016 untuk TURP atau open prostatectomy. Data dianalisis menggunakan uji Fischer dan Mann-Whitney. **Hasil:** Dari 62 pasien, 49 pasien (79.03%) menjalani TURP dan 13 pasien (26.53%) diantaranya mengalami komplikasi perdarahan. Open prostatectomy dijalani oleh 13 pasien (20.97%) dan 6 pasien (46.15%) diantaranya mengalami komplikasi perdarahan. Uji Fischer menunjukkan tidak ada perbedaan signifikan pada TURP dan open prostatectomy ($p=0.192$), termasuk pada kelompok pasien dengan retensi urin ($p=0.451$), tanpa retensi urin ($p=0.249$), usia di bawah 70 tahun ($p=0.140$) dan di atas 70 tahun ($p=1$). Uji Mann-Whitney menunjukkan ada perbedaan volume perdarahan yang signifikan antara TURP dan open prostatectomy ($p=0.012$). **Simpulan:** Tidak ada perbedaan komplikasi perdarahan yang signifikan pada TURP dan open prostatectomy. Namun, antara TURP dan open prostatectomy, terdapat perbedaan volume perdarahan yang signifikan.

Kata Kunci: Benign prostatic hyperplasia, transurethral resection of prostate, open prostatectomy, komplikasi perdarahan, cross-sectional.

Correspondence: Ancelia Limantara; c/o: Faculty of Medicine/Universitas Airlangga, Surabaya. Jl. Mayjen. Prof. Dr. Moestopo 47 Surabaya 60131. Phone: +62315030252-3; Fax: +62315022472. Mobile phone: +6281938045328. Email: ancelia.limantara@hotmail.co.id.

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) is the enlargement of prostate gland, which is common among elderly. The risk of BPH is increasing with age. The prevalence of BPH is 40% in age 60, 80% in age 80 and almost everyone in age 90. As the life expectancy has increased, BPH becomes one of the most significant diseases in elderly and the right treatment for BPH is needed.^{1,2} The methods of treatments for BPH are conservative or watchful waiting, drugs, and surgery. The methods are chosen by considering patients' signs and symptoms, clinical history and available facilities in hospital. One of definitive treatment for BPH is surgery. Two commonly used method of BPH surgery in Indonesia are Transurethral Resection of Prostate (TURP) and open prostatectomy. TURP is gold standard for treating BPH with prostate volume 30-80 ml, open prostatectomy is indicated for prostate volume more than 80 ml or BPH with complications. Both have surgical complications. In TURP, the complications are bleeding, clot retention, TUR syndrome, and UTI. In open prostatectomy, the complications are bleeding and urine incontinence. Bleeding is one of the most common surgical complications, which occurs in 7% in TURP and 22% in open prostatectomy.³⁻⁵ Bleeding complication is important because it is one of the determinant factors to evaluate morbidity in surgery.⁶ Only few researches for bleeding during BPH surgery are done in Indonesia.

OBJECTIVE

This study aimed to analyze the difference in bleeding complications between TURP and open prostatectomy in patients with BPH in Indonesia.

MATERIAL & METHODS

This study was an observational study with cross-sectional design. The sampling was done using consecutive technique. A total data of 62 patients were enrolled in this study between January 2015 and December 2016. The data was obtained from medical records of patients. The inclusion criteria: patient with BPH, age above 21 years old, undergone TURP or open prostatectomy in Poli Urologi Soetomo Hospital Surabaya and had complete medical record. Exclusion criteria: patient undergone other method of surgery and incomplete

medical record. Diagnose of BPH and urine retention, age, method of surgery and bleeding incidence was collected from medical record for analyzing. BPH and urine retention were diagnosed by clinicians in Poli Urologi Soetomo Hospital Surabaya. Bleeding incidence was collected from medical record and bleeding volume was measured by estimating the blood loss during surgery. Bleeding volume for TURP was measured by estimating blood loss from color or specific gravity from irrigation fluid. Bleeding volume for open prostatectomy was measured by tampon used in surgery. For analyzing purpose, method of surgery was counted as nominal, TURP or open prostatectomy. Age was counted as nominal, age below 70 or above 70. Urine retention was counted as nominal, with or without urine retention. Bleeding incidence was counted as nominal, bleeding or not. Bleeding volume was counted as numerical. In statistical analyzes, Fischer and Mann-Whitney test were used. Statistical Package for the Social Sciences (SPSS) 16.0 software was used to analyze data and $p < 0.05$ was considered as statistically significant.

RESULTS

A total of 62 patients' medical records were analyzed, including 49 (79.03%) patients from TURP group and 13 (20.97%) patients from open prostatectomy group. The mean age was 66.03 and the age range was 41-93. For TURP group, the mean age was 66.43 and the age range was 41-91. For open prostatectomy group, the mean age was 64.53 and the age range was 51-76. Sample characteristic were noticed based on age, method of surgery, urine retention and bleeding complications. Bleeding incidence was found in 13 (26.53%) patients from TURP group and in 6 (46.15%) patients from open prostatectomy group (Table 1). The Fischer test was not significant ($p=0.192$).

Then, the patients were categorized based on age and urine retention (Table 2). For TURP group, bleeding incidence was found in 24.2% in age below 70 yo, 31.3% in age above 70 yo, 30.3% in group with urine retention and 18.8% in group without urine retention. For open prostatectomy group, bleeding incidence was found in 50.0% in age below 70 yo, 33.3% in age above 70 yo, 44.4% in group with urine retention and 50.0% in group without urine retention. In all group, Fischer test was not significant, age below 70 yo ($p=0.140$), above

Table 1. Comparison of bleeding incidence between TURP and open prostatectomy.

Complication	TURP		Open Prostatectomy		p value
	N (patient)	Percentage (%)	N (patient)	Percentage (%)	
Bleeding incidence	13	26.53	6	46.15	0.192

Table 2. Comparison of bleeding incidence according to age and urine retention.

		Bleeding Incidence		p value
		TURP (%)	Open Prostatectomy (%)	
Age	Below 70	24.2	50.0	0.140
	Above 70	31.3	33.3	1.000
Urine retention	With urine retention	30.3	44.4	0.451
	Without urine retention	18.8	50.0	0.249

Table 3. Comparison of bleeding volume between TURP and open prostatectomy.

	TURP		Open Prostatectomy		p value
	Median (ml)	Range (ml)	Median (ml)	Range (ml)	
Bleeding volume	225	100-800	750	600-1300	0.012

70 yo ($p=1.000$), with urine retention ($p=0.451$) and without urine retention ($p=0.249$).

From 62 patients' medical record, bleeding volume was recorded in 13 patients, 7 patients from TURP group and 6 patients from open prostatectomy group (Table 3). For TURP group, the median of bleeding volume was 225 ml and bleeding volume range was 100-800 ml. For open prostatectomy group, the median of bleeding volume was 750 ml and bleeding volume range was 600-1300 ml. Mann-Whitney test was significant ($p=0.012$).

DISCUSSION

The mean age from this study was 66.03 yo for all group, 66.43 yo for TURP group and 64.54 yo for open prostatectomy group. Recent studies also showed similar result with this study. Kiptoon reported 66.71 yo for all group, 66.5 yo for TURP group and 67.78 yo for open prostatectomy group.⁴ Recent studies reported that there was relationship between age and prostate volume. Incidence of prostate enlargement increases with age and more significant in elderly group.^{1,2,7}

In this study, TURP was done in 49 (79.03%) patients and open prostatectomy was done

in 13 (20.97%) patients. The result was similar with study by Kiptoon but different with study from Simforoosh et al. Kiptoon reported TURP was done in 67-90% and open prostatectomy was done in 14-40%.⁴ Simforoosh et al., reported TURP was done in 49% and open prostatectomy was done in 51%.⁸ The difference could be caused by the prostate volume and other complications, such as urinary stone.

Bleeding incidence between TURP and open prostatectomy was not statistically significant ($p=0.129$). But the bleeding incidence for open prostatectomy (46.15%) was higher than TURP group (26.53%). This result was similar with other recent studies. Haddad et al., and Kiptoon reported bleeding incidence for open prostatectomy (22.16% and 22%) was higher than TURP (2.65% and 7%).^{3,4} In this study, the median of bleeding volume for open prostatectomy (750 ml) was higher than for TURP (225 ml). This result was similar with recent studies. Carneiro et al., and Teo et al., reported bleeding volume for TURP and open prostatectomy for 350 ml and 1044 ml.^{6,9} The risk of bleeding was influenced by many factors, including method of surgery, surgeon's experience, instruments used in surgery, and hospital's type. Open surgery and

teaching hospital had higher risk of bleeding.^{10,11} The risk of bleeding for open prostatectomy was higher because the indication for open prostatectomy was prostate volume more than 80 ml, bigger than TURP. Bigger prostate volume required more resection and increased the morbidity of surgery, including bleeding.^{5,12} Another study reported that keeping the hemostatis stable in open surgery, including open prostatectomy was not easy.¹³ In open prostatectomy, not all bleeding could be controlled because there were few method of surgery which had difficulty for accessing the capsule of prostate.¹⁴

Age was related to comorbidities such as hypertension and diabetes mellitus. This comorbidities could increase the risk of bleeding.¹¹ Age was also related to prostate volume. Prostate size was increasing with age. Bigger prostate volume required more resection and increased the morbidity of surgery, including bleeding. Reese reported age increased the risk of bleeding. In this study, there were not significant difference in bleeding incidence between age below 70 yo and above 70 yo, but clinically there were different.¹¹ In TURP, the bleeding incidence were higher in above 70 yo group, suitable with study by Reese. But, in open prostatectomy, bleeding incidence were higher in below 70 yo group. This could happen because the sample size for open prostatectomy was only 13 patients, causing bleeding incidence in one patients could lead to much bigger percentages. Elshal also reported age could increase the morbidity of surgery, but statistical analyzes were not done.¹²

This study also showed there were not significant difference in bleeding incidence between patient with urine retention and without urine retention. But, clinically there were big differences. From 19 patients with bleeding incidences, 14 patients had urine retention and only 5 did not have urine retention. Tzou et al., reported patient with urine retention had higher risk of bleeding.¹⁵ Urine retention was caused by bigger prostate volume or bigger inflammation reaction, increasing resection volume of prostate and risk of surgery morbidity.

CONCLUSION

There was no significant difference in bleeding complications between TURP and open prostatectomy in patients with BPH. But, between TURP and open prostatectomy significant difference in bleeding volume was found. We suggested that both TURP and open prostatectomy still could be

used in treatment for BPH. But, because of bleeding volume in open prostatectomy were significantly bigger than TURP, we suggested that surgeon paid more attention for bleeding prevention in open prostatectomy.

ACKNOWLEDGEMENT

The study material, patients' medical record was provided by Soetomo Hospital Surabaya and the study was done in Universitas Airlangga, Surabaya, East Java, Indonesia.

REFERENCES

1. Dhingra N, Bhagwat D. Benign prostatic hyperplasia: An overview of existing treatment. *Indian Journal of Pharmacology*. 2011; 43(1): 6-12.
2. NG B, Dasan TA, Patil SS. Correlation of sonographic prostate volume with international prostate symptom score in South Indian men. *International Journal of Research in Medical Science*. 2015; 3(11): 3126-30.
3. Haddad D, Krane L, Badlani G, Mirzazadeh M, Winston-Salem. Comparison of Surgical Outcomes in Benign Prostatic Hypertrophy Management Using The National Surgical Quality Improvement Program. *The Journal of Urology*. 2015; 193(22).
4. Kiptoon DK. The Immediate Postoperative Outcome of Patients Undergoing Prostatectomy For Benign Prostatic Hyperplasia at Kenyatta National Hospital. Dissertation, Kenya, University of Nairobi; 2004.
5. Mochtar CA, Umbas R, Soebadi DM, Rasyid N, Noegroho BS, Poernomo BB, et al. Panduan Penatalaksanaan Klinis Pembesaran Prostat Jinak (Benign Prostatic Hyperplasia/BPH), Ikatan Ahli Urologi Indonesia (IAUI); 2015.
6. Carneiro A, Sakuramoto P, Wroclawski M L, Forseto P H, Julio A D, Bautzer C R D, et al. Open suprapubic versus retropubic prostatectomy in the treatment of benign prostatic hyperplasia during resident's learning curve: A randomized controlled trial. *International Brazilian of Journal Urology*. 2016; 42(2): 284-92.
7. Alawad AAM, Elamin SM, Younis FH. Correlation between prostate volume and lower urinary tract symptoms in Sudanese patients with benign prostatic hyperplasia Correlation between prostate volume and lower urinary tract symptoms in Sudanese patients with benign prostatic hyperplasia. *Basic Research Journals*. 2015; 4: 121-4.
8. Simforoosh N, Abdi H, Kashi A H, Zare S, Tabibi A, Danesh A, et al. Open Prostatectomy Versus Transurethral Resection of the Prostate, Where Are We Standing in the New Era. *Urology Journal*. 2010; 7: 262-9.
9. Teo JS, Lee YM, Ho HSS. An Update on Transurethral

- Surgery for Benign Prostatic Obstruction. *Asia Journal of Urology*. 2017; 4: 195-8.
10. Johnson S C, Packiam V T, Golan S, Cohen A J, Nottingham C U, Smith N D. The Effect of Obesity on Perioperative Outcomes for Open and Minimally Invasive Prostatectomy. *Urology*. 2016;100:111-116.
 11. Reese SW. The Incidence of Venous Thromboembolism and Pharmacologic Thromboprophylaxis Following Major Urologic Surgery: A Population-Based Analysis. Thesis, Boston, Boston University; 2013.
 12. Elshal AM, El-Nahas AR, Barakat TS, Elsaadany MM, El-Hefnawy AS. Transvesical open prostatectomy for benign prostatic hyperplasia in the era of minimally invasive surgery: Perioperative outcomes of a contemporary series. *Arab Journal of Urology*. 2011; 11: 362-8.
 13. Loeb S, Catalona WJ. Open radical retropubic prostatectomy. *Urologic Oncology: Seminars and Original Investigations*. 2007; 25: 494-8.
 14. Braeckman J, Denis L. Management of BPH then 2000 and now 2016 - From BPH to BPO. *Asian Journal of Urology*. 2017; 4: 138-47.
 15. Tzou KY, Kao WT, Lan CY, Ho CH, Chiang YT, Chen KC. Management of prostate enlargement with acute urinary retention: Diode laser vaporization in combination with bipolar transurethral resection of the prostate. *Urological Science*. 2016; 27: 31-34.