การศึกษาตามรุ่นย้อนหลังเปรียบเทียบความรุนแรงของภาวะเลือดออกภายหลังการผ่าตัดต่อมลูกหมากด้วยวิธีส่องกล้อง ระหว่างการดึงคอกระเพาะปัสสาวะผ่านสายสวนปัสสาวะโดยใช้ลูกโป่งน้ำสะอาดปริมาณ 30 และ 50 มิลลิลิตร

ณวัฒน์ โอฬารสกุลชัย [1], วัฒนชัย อึ้งเจริญวัฒนา [1]

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บทคัดย่อ

บทนำ: ภาวะเลือดออกภายหลังการผ่าตัดต่อมลูกหมากด้วยวิธีการส่องกล้อง เป็นภาวะแทรกซ้อนที่พบได้บ่อยและอาจรุนแรงถึงขั้นให้สารเลือด การดึงคอกระเพาะปัสสาวะด้วยสายสวนปัสสาวะโดยใช้บอลลูนน้ำสะอาดเป็นหนึ่งในวิธีการช่วยลดภาวะดังกล่าวแต่ยังไม่มีงานวิจัยใดศึกษาถึงปริมาตรของบอลลูนน้ำสะอาดที่เหมาะสม งานวิจัยนี้ทำเพื่อศึกษาเปรียบเทียบระหว่างการดึงคอกระเพาะปัสสาวะด้วยปริมาตร 30 และ 50 มิลลิลิตร

วัตถุประสงค์: เพื่อเปรียบเทียบความรุนแรงของภาวะเลือดออกภายหลังการผ่าตัดต่อมลูกหมากด้วยวิธีการส่องกล้อง ระหว่างการดึงคอกระเพาะปัสสาวะผ่านสายสวนปัสสาวะขนาด 24 Fr ด้วยลูกโป่งน้ำสะอาดขนาด 30 และ 50 มิลลิลิตร ในโรงพยาบาลสรรพสิทธิประสงค์ จังหวัดอุบลราชธานี

วัสดุและวิธีการ: ศึกษาตามรุ่นย้อนหลัง (retrospective cohort study) โดยเก็บข้อมูลด้านประชากร เช่น ยาโรคต่อมลูกหมากโตที่คนไข้ได้รับและข้อมูลเกี่ยวกับการผ่าตัดจากกลุ่มประชากรผู้ป่วยต่อมลูกหมากโตที่เข้ารับการผ่าตัดต่อมลูกหมากด้วยวิธีส่องกล้องและได้รับการดึงคอกระเพาะปัสสาวะผ่านสายสวนปัสสาวะด้วยปริมาณ 30 หรือ 50 มิลลิลิตร ที่โรงพยาบาลสรรพสิทธิประสงค์ระหว่าง เดือนมกราคม พ.ศ. 2560 ถึง 2563

ผลการศึกษา: จากผู้ป่วย 211 รายที่เข้ารับการผ่าตัดต่อมลูกหมากด้วยวิธีส่องกล้อง มี 189 รายที่เข้าได้กับเกณฑ์คัดเข้า เมื่อหักกลุ่มที่เข้าได้กับเกณฑ์คัดออก 23 รายเหลือ 166 รายที่สามารถเข้าสู่วิจัยได้ กลุ่มตัวอย่างประกอบด้วยคนไข้ 141 รายที่ได้รับการดึงคอกระเพาะปัสสาวะด้วยปริมาณ 30 มิลลิลิตร และ 25 รายที่ขนาด 50 มิลลิลิตร ไม่พบความแตกต่างอย่างมีนัยสำคัญทางสถิติในด้านประชากรศาสตร์ การได้รับยารักษาต่อมลูกหมากโตก่อนผ่าตัด ชนิดขั้วไฟฟ้าที่ใช้ และระยะเวลาในการผ่าตัดระหว่างสองกลุ่ม นอกจากนี้อัตราการล้างกระเพาะปัสสาวะ (p-value = 0.64) และการให้เลือด (p-value = 0.22) ภายหลังจากผ่าตัดก็ไม่แตกต่างอย่างมีนัยสำคัญ

สรุป: การใช้ขนาดของลูกโป่งน้ำสะอาดที่ใหญ่ขึ้นจาก 30 เป็น 50 มิลลิลิตร ในการดึงคอกระเพาะปัสสาวะภายหลังการผ่าตัดต่อมลูกหมากด้วยวิธีส่องกล้อง ไม่ส่งผลต่อภาวะเลือดออกหลังผ่าตัดอย่างมีนัยสำคัญทางสถิติ

คำสำคัญ: ต่อมลูกหมากโต, ดึงคอกระเพาะปัสสาวะ, ผ่าตัดต่อมลูกหมากด้วยวิธีส่องกล้อง, เลือดออกหลังผ่าตัด

[1] หน่วยศัลยกรรมทางเดินปัสสาวะ กลุ่มงานศัลยกรรม โรงพยาบาลสรรพสิทธิประสงค์ จ.อุบลราชธานี

ผู้นิพนธ์ที่รับผิดชอบบทความ: นพ.ณวัฒน์ โอฬารสกุลชัย กลุ่มงานศัลยกรรม โรงพยาบาลสรรพสิทธิประสงค์ อ.เมือง จ.อุบลราชธานี 34000
อีเมล: tam19734@docchula.com

Introduction

Benign prostatic hyperplasia (BPH), defined as obstruction of urinary passage by prostate enlargement causing bothersome lower urinary tract symptoms, is a common disease in aging men with world-wide prevalence of 50-75% among men over the age of 50 years and aforementioned prevalence would reach 80% by the age of 70 years.[1] BPH is the leading cause of lower urinary tract symptoms (LUTS) in male of all ages.[2] Despite vast invention and robust application of newer minimal invasive surgery for BPH,[3] transurethral resection of prostate (TURP) remains the gold standard for BPH surgery due to lower rate of complications and excellent voiding outcomes.[4] Postoperative hemorrhage is among the most common complications after TURP owing to its rich vascular supply, found at 0.4-7%.[5] Several factors ameliorate postoperative hemorrhage such as premedication with 5-alpha reductase inhibitors (5-ARIs) such as finasteride or dutasteride prior to surgery,[6–8] type of anesthesia,[9] absence of urinary tract infection before surgery,[10] foregoing antiplatelet before surgery,[11] type of resectoscope polarity[12] and volume of prostate resected.[13] Despite meticulously coagulation is usually performed at the end of surgery to minimize bleeding, TURP still results in significant postoperative hemorrhage which is sometimes life-threatening.[14] Though most of which severity is trivial, and could be stopped with bladder neck compression by Foley's catheter traction,[15] and only small percentage of patients bleed profusely and failed conservative management so that they require re-operation or angioembolization of prostate.[16]

Balloon tamponade of bladder neck after TURP is a standard practice in many institution, however, no consensus on standardized procedure of traction or balloon volume has been described.[17] At division of Urology in Sunpasitthiprasong hospital, balloon tamponade would be applied by insertion of Foley's catheter passing urethra into bladder, inflation of its balloon by sterile water to a certain volume, manually pull the catheter and strapping its distal end to patient's right thigh. (Figure 1) The traction was applied to almost all patient, but the volume differed between patients depending on operating surgeon, commonly between 30-50 ml. Most believed the bigger balloon would result in the larger area of pressure on resected prostate leading to the question of this study. The primary objective of this study is to clarify if different volume of Foley's balloon used for traction would significantly alter hemorrhage after resection define approximately by the need for blood transfusion and incident of bladder irrigation from clot retention in bladder within 24 hours after surgery. We theorize that larger balloon of 50 ml would result in lower incident of significant hemorrhage.

Figure 1: Demonstration of balloon tamponade by foley's catheter traction traction and strapping 3-way catheter to patient's right thigh

Material and methods

study design

A retrospective cohort study, approved by Sunpasitthiprasong hospital ethics committee protocol no. 025/63 R was undertaken at Sunpasitthiprasong hospital, collecting data extracted from medical record program named Opserve from January 2017 to January 2020. List of possibly eligible patients was manually chosen from record book of all cases admitted to urology ward by author. Gathering of data was started after ethical committee approval.

Collected data includes 1) demographic information such as age, comorbidity, medication taken prior to surgery and surgical history. 2) Surgery-related parameters such as resectoscope polarity, type of anesthesia, duration of surgery, intraoperative blood loss, need for bladder irrigation after surgery, need for blood transfusion and pathological results of resected prostate.

statistical analysis

Statistical analyses were performed using SPSS version 21th. P-value of less than 0.05 was considered statistically significant. Categorical, normally and non-normally distributed continuous variables were described as number (%) and mean (standard deviation, SD). On the contrary median (interquartile range, IQR) was used in the abnormally distributed data. Chi-square test was used for the comparison of categorical variables of baseline characteristic and postoperative complications.

Results

As of the specified period of study, there were 211 patients under went TURP and 189 patients met the inclusion criteria. With 23 met the exclusion criteria, 166 patients were included in the study. Data as described were extracted from electronic medical record for statistical analysis.

demographic data

There was no significant difference in demographic data (Table 1) between the two groups.

Table 1 baseline characteristics and surgical factors

characteristic	Total	30 ml balloon (n=141)	50 ml balloon (n=25)	P value
Age, years	166	71 (52-87)	70.2 (53-89)	0.65
5-ARI	62	55 (39%)	7 (4%)	0.29
PSA, ng/mL	166	5.72 (3.2-11.6)	5.43 (3.8-11.4)	0.403
Mean resection time		70 (55-85)	65 (50-90)	0.47
Spinal anesthesia		150 (97.5%)	11 (91.6%)	

data are n (%) or median (IQR). PSA = prostate-specific antigen

surgical factors

Mean duration of resection was 70 minutes (IQR 55-85) and 65 minutes (IQR 50-90) in group of balloon traction at 30 ml and 50 ml respectively, of which showed no statistical difference (p-value = 0.47, Mann-Whitney U test). Of the 154 patients with 30 ml balloon traction, 150 (97.5%) reported receiving spinal anesthesia and 4 (2.5%) reported receiving general anesthesia. From 12 patients with 50 ml balloon traction, 11 (91.6%) reported receiving spinal anesthesia while 1 (8.4%) received general anesthesia. Off all 23 cases recorded polarity of resectoscope, 8 cases were monopolar (33.3%) and 16 were bipolar (66.6%).

Relation between traction balloon volume and postoperative hemorrhage

Among 10 patients with significant postoperative hemorrhage needing bladder irrigation, 9 (6.4%) were in 30 ml balloon group and 1 (4%) were in 50 ml group. Of 6 patients bleeding were severe enough that required blood transfusion, 4 (2.8%) were in 30 ml group and 2 (8%) were in 50 ml group. (Table 2)

Table 2 bladder irrigation and blood transfusion incidence after TURP (n=166)

	Total (n=166)	Balloon 30 ml (n=141)	Balloon 50 ml (n=25)	P value
Bladder irrigation	10 (6)	9 (6.4)	1 (4)	0.64
Blood transfusion	6 (3.6)	4 (2.8)	2 (8)	0.22

Data are n (%)

Discussion

The analysis of this trial has not shown any benefit regarding hemorrhage from increasing traction balloon volume from 30 ml to 50 ml. Advantage regarding reduction in bleeding was inferred from the need of blood transfusion and bladder irrigation in 24 after surgery. Although the low significant bleeding rate observed suggested poor scope for improvement in this patient group.

From study of Walker et al, postoperative bladder neck traction with catheter tamponade for 30 minutes reduces postoperative hemorrhage. Rate of blood transfusion need in cited paper was roughly 11% while in this study is approximately 6%. The difference could be due to improvement in instrumentation.[15] Further improvement of the technique were made by several urologists. One popularized method was by creating pressure on prostatic fossa via strapping of catheter to patient's right thigh or anterior abdomen. Duration of traction ranged from couple of hours to overnight depend of surgeon preference.[18] Nowadays many publication focused on method of balloon tamponade and it's duration,[19] none devoted on the volume of balloon.[20]

Possibly most entertained complication was hemorrhage and numerous studies shed light on various method to prevent such event, many focus on drug administrated perioperatively and others on traction method. None focus on amount of balloon size used for traction. According to this study which compared two groups of patients; tamponade balloon of 30 ml and 50 ml, both showed no statistical significance difference regarding severity of postoperative hemorrhage measured by need for blood transfusion and bladder irrigation. Of note, from all 6 patients requiring blood transfusion, neither the exact indication for blood transfusion nor confounding underlying disease such as anemia were recorded which further disfigure the reliability of using transfusion as a representative for prostatic hemorrhage severity.

The study has several limitations owning to its nature of retrospective study. Although various parameters were recorded, many which that would affect hemorrhagic outcome were missing from medical record such as resected prostate weight or duration of Foley's catheter traction and even perioperative blood loss making information from this study could barely be used clinically. However, this study marked first study regarding Foley's catheter balloon size and would yield statistically meaningful data for further study. As long as data are concerned now, using larger balloon size was only applied according to expert opinion and has no strong evidence-based recommendation. Practically, a standard 30 ml balloon should be used. Further randomized controlled trial comparing 30 ml and 50 ml balloon traction would be highly efficient in supplementing robust data regarding blood loss between the two.

Conclusion

Increasing the volume of balloon used for bladder neck tamponade after TURP from 30 ml to 50 ml does not decrease incidence of significant postoperative prostatic hemorrhage defined by need for bladder irrigation-from blood clot accumulation in bladder-and blood transfusion. The authors discourage such increment because the larger the balloon, the higher risk of traction complication such as bladder neck necrosis, abdominal pain, catheter leakage, urethrocutaneous fistula and penile necrosis, would occur.[21]

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Potential conflict of interest

The authors declared no conflict of interest.

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Comparison of balloon tamponade after transurethral resection of the prostate using Foley's catheter filled with 30- and 50-ml sterile water - A retrospective cohort study

Nawat Oulansakoonchai [1], Wattanachai Ungjaroenwathana [1]

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ABSTRACT

Background: Venous hemorrhage in resected area is a common complication after transurethral resection of prostate (TURP) which could lead to significant blood loss resulting in blood transfusion. The temporary traction using balloon tamponade is a widely used technique to stop such bleeding but no definite balloon volume has been proposed.

Objective: To compare incident of significant post-TURP hemorrhage defined by the need for bladder irrigation and need for blood transfusion between 24-Fr Foley's catheter traction at bladder neck with 30 ml and 50 ml balloon of sterile water.

Material and method: Data of all participants underwent TURP procedure from January 2017 to January 2020 were retrospectively reviewed. Inclusion criteria are patient who underwent TURP which received Foley's catheter traction with 30 ml and 50 ml. balloon of sterile water, and age of 50-90. Exclusion criteria are pathologic result of malignancy and cases which resected prostate were less than 10 g. Demographic data such as age, comorbidity and current benign prostatic hyperplasia (BPH) medication were recorded. Perioperative parameters such as type of polarity of resectoscope, type of anesthesia, operative time, need for bladder irrigation, need for blood transfusion and pathological reports were collected and analyzed.

Results: Of all 211 patients underwent TURP, 189 patients met the inclusion criteria, 23 patients were excluded according to exclusion criteria and 166 patients were eligible for analysis. No statistically significant different in age, rate of receiving alpha blocker or 5-ARI, polarity of resectoscope and operative time are founded. Need for bladder irrigation (p-value 0.64) and blood transfusion (p-value 0.22) are also not significantly different between traction with 30 and 50ml volume of balloon.

Conclusion: In case of benign prostatic BPH, the 50 ml-balloon traction of bladder neck post TURP has no benefit to prevent hemorrhage more than 30 ml balloon traction.

Keywords: benign prostatic hyperplasia (BPH), balloon tamponade at bladder neck, transurethral resection of prostate (TURP), postoperative hemorrhage.

[1] Division of Urology, Department of Surgery, Sunpasitthiprasong hospital, Ubon Ratchathani

Corresponding author: Nawat Oulansakoonchai, Division of Urology, Department of Surgery, Sunpasitthiprasong hospital, Ubon Ratchathani 34000 Email: tam19734@docchula.com