Original Article

Is the amount of resected prostate tissue from transurethral prostatectomy related to outcome?

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Keywords:
resected prostate tissue, transurethral prostatectomy

Abstract

Objective: To evaluate the amount of resected prostatic tissue from transurethral prostatectomy and the improvement of lower urinary tract symptoms (LUTS) in patients with benign prostatic hyperplasia.

Material and Method: The study includes a prospective analysis of 36 men with benign prostatic hyperplasia. Patients were divided into 2 groups according to the mean percentage of resected tissue: group 1, less than mean percentage, group 2, more than mean percentage. Each patient was evaluated using the International Prostate Symptom Score (IPSS) and Quality of Life (QoL) before surgery, and at 1 and 3 months after surgery.

Result: Mean percentage of resected prostate tissue was 28%. IPSS score had decreased by 17.72 at 1 month and 18.05 at 3 months. Patients in group 2 had an IPSS lower than group 1 by 2.33 (P=0.02). QoL score had decreased by 3.56 at 1 month and 3.47 at 3 months (p<0.001). Patients in group 2 had a QoL lower than group 1 by 0.45 (P=0.03).

Conclusion: The amount of resected prostate tissue had a slight influence on the difference in LUTS and QoL after TURP.

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นิพนธ์ต้นฉบับ

การศึกษาความสัมพันธ์ของปริมาณต่อมลูกหมากที่ได้จากผ่าตัดด้วยวิธีส่องกล้องกับการเปลี่ยนแปลงอาการหลังผ่าตัด

ชวัฒน์ อังสุรักษ์, วชิร คชการ, เจริญ ลีลานุพันธ์, วิสูตร คงเจริญสมบัติ, วิทย์ วิเศษสินธุ์, กิตติณัฐ กิจวิกัย, เปรมสันติ์ สังฆ์คุ้ม, ปกเกศ ศิริศรีตรีรักษ์, พชรพงศ์ เจนจิตรานันท์

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คำสำคัญ:
ปริมาณต่อมลูกหมาก
การผ่าตัดด้วยวิธีส่องกล้อง

บทคัดย่อ

วัตถุประสงค์: เพื่อเปรียบเทียบปริมาณต่อมลูกหมากที่ผ่าตัดด้วยวิธีส่องกล้องกับการเปลี่ยนแปลงของอาการผู้ป่วยต่อมลูกหมากโต

ผู้ป่วยและวิธีการศึกษา: เก็บข้อมูลผู้ป่วยที่ได้รับการผ่าตัดต่อมลูกหมากด้วยการส่องกล้องตั้งแต่เมษายน พ.ศ. 2559 ถึง กรกฎาคม 2560 จำนวน 36 คน แบ่งเป็น 2 กลุ่ม โดยกลุ่มที่ 1 เป็นผู้ป่วยที่ได้ผ่าตัดปริมาณต่อมลูกหมากน้อยกว่าค่าเฉลี่ย และกลุ่มที่ 2 เป็นผู้ป่วยที่ได้ผ่าตัดปริมาณต่อมลูกหมากมากกว่าค่าเฉลี่ย โดยผู้ป่วยจะได้รับการประเมินอาการต่อมลูกหมากโตด้วย IPSS score และ QoL score ทั้งก่อนผ่าตัด หลังผ่าตัด 1 เดือนและ 3 เดือน

ผลการศึกษา: ค่าเฉลี่ยของต่อมลูกหมากที่ผ่าตัดในการวิจัยนี้ คือ ร้อยละ 28 ค่า IPSS ลดลง 17.72 ที่ 1 เดือน และ 18.05 ที่ 3 เดือน โดยที่ผู้ป่วยกลุ่มที่ 2 มีค่า IPSS ลดลงมากกว่ากลุ่มที่หนึ่ง 2.33 (P=0.02) ส่วนค่า QoL ลดลง 3.56 ที่ 1 เดือน และ 3.47 ที่ 3 เดือน โดยที่ผู้ป่วยกลุ่มที่ 2 มีค่า QoL ลดลงมากกว่ากลุ่มที่หนึ่ง 0.45 (P=0.03)

สรุป: ปริมาณของต่อมลูกหมากที่ผ่าตัดมีผลต่ออาการและคุณภาพชีวิตของผู้ป่วยเล็กน้อย

ผู้นิพนธ์หลัก: ชวัฒน์ อังสุรักษ์ หน่วยศัลยศาสตร์ระบบปัสสาวะ ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล กรุงเทพฯ

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Introduction

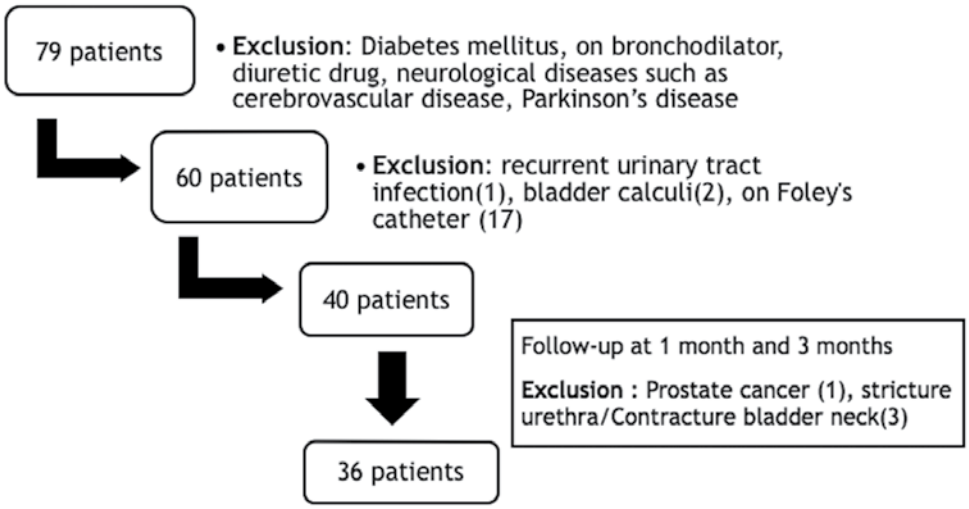
Benign prostatic hyperplasia (BPH) is a pathologic process that is one major cause of lower urinary tract symptoms (LUTS) in aging men; it is characterized by an increased number of epithelial and stromal cells in the periurethral area. BPH is rarely fatal and its effect on quality of life depends on symptom severity. The size of the prostate does not correlate with the degree of obstruction and severity.[6]

Transurethral resection of the prostate (TURP) is accepted as the gold standard in the surgical treatment of BPH. But the amount of tissue that should be resected during TURP is questionable. The recommended TURP technique consists of the complete removal of the entire adenoma inside the surgical capsule for a better clinical outcome.[11] Others, however, have shown that partial resection produces short-term functional results comparable to complete TURP.[1,2] The complication rate seems to be related to resection time and prostate size.

The aim of this study was to evaluate the amount of resected prostate tissue from transurethral prostatectomy and the clinical outcome after surgery.

Material and method

From April 2016 to July 2017, 79 men underwent TURP (bipolar) for treatment of LUTS due to BPH. After excluding patients with risk factors that can cause LUTS other than BPH (diabetes mellitus, on bronchodilator, diuretic drug, and neurological diseases such as cerebrovascular disease, Parkinson's disease), there were 60 patients. In 60 patients, 1 patient had recurrent UTI, 2 patients had bladder calculi and 17 patients with urinary retention had to retain Foley's catheter. These patients were excluded from the study. The final sample comprised 40 patients who had moderate or severe LUTS that were refractory to medical treatment. All these patients were at least dissatisfied with their urinary condition. Patients who had urethral stricture or contracture bladder neck (3 cases) after follow-up or whose pathology was prostatic carcinoma (1 case) were also not considered for analysis.



All patients were accessed LUTS with an IPSS score, and had detailed physical examinations and urinalysis. After anesthesia, prostate volume was measured with transrectal ultrasound and estimated as length x width x height x 0.52. The volume of prostate (cc) was multiplied by 1.05 to estimate the weight of the prostate (gm). The resected tissue was systematically weighed immediately after the surgical procedure.[12]

Mean percentage of resected prostate was 28%. Patients were divided into 2 groups according to the mean percentage of resected prostate tissue (%), group 1 had resected prostate tissue lower than 28% and group 2 had more than 28%. Table 1 shows the baseline demographic characteristics of the 2 study groups. There was a difference in IPSS but similar mean patient age and QoL between the groups.

Patient Name _____ Date _____ Circle the number that best apploes to you.

	Less Not at all in 5	Less than 1 time time	About than 1/2 the	More 1/2 the time time	than 1/2 the	Almost always
1. Incomplete Emptying Over the last month how, offen have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5
2. Frequency During the last month, how often have you had to urinate again less than two hours after you finish urinating?	0	1	2	3	4	5
3. Intermittency During the last month, how often have you stopped and started again several times when you urinate?	0	1	2	3	4	5
4. Ugency During the last month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5
5. Weak Stream During the last month, how often have you had a weak urinary stream?	0	1	2	3	4	5
6. Straining During the last month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5
7. Nocturia During the last month, how many times did you most typically get up to urinate from the time you went to bed until the time you get up in the morning	0	1	2	3	4	5

Add the score for each number above, and write the total in the spaco to the right TOTAL_____

SYMOTOM SCORE: 1-7 = MILD 8-9 = MODERATE 20-35 = SEVERE

0=Delighted, 1=Pleased, 2=Mostly Satisfied, 3=Mixed, 4=Mostly Not Satisfied, 5=Unhappy

8. Nocturia How would you fell if you had to live with your urinary condition the way it is now, no better, no worse, for the rest of your life?	0	1	2	3	4	5

International Prostatic Symptom Score (IPSS)

Table 1. The baseline demographic characteristics of two study groups.

	Group 1 Percentage of removal <0.28 (n=20)	Group 2 Percentage of removal >0.28 (n=16)	P value
Age (year), Mean (SD)	67.25 (8.23)	70.81 (8.83)	0.22 (t-test)
Median IPSS (Range)	26 (14-34)	21 (15-36)	<0.01 (bsqreg)
Median QoL (Range)	5 (1-6)	4.5 (3-6)	1.00 (bsqreg)
Prostate size (gm)	49.05	70.69	<0.01 (t-test)

Some delayed postoperative bleeding is frequently noted around 1 to 4 weeks and is frequently accompanied by some sloughed tissue or eschar.[7] Therefore, the patients were assessed IPSS and QoL again after 4 weeks (at 1 and 3 months in this study).

Result

Median postoperative at 1 month were 6.5 and 3.5 respectively (P=0.14). Median postoperative at 3 months were 6.5 and 3 respectively (P=0.06). Median preoperative QoL were 5 and 4.5 respectively (P=1). Median postoperative QoL were 1 in both groups at both 1 and 3 months.

Table 2. IPSS and QoL of the 2 study groups at 1 and 3 month

	Group 1 Percentage of removal <0.28 (n=20)	Group 2 Percentage of removal >0.28 (n=16)	P value
Postoperative 1 month			
Median IPSS (Range)	6.5 (0-15)	3.5 (0-12)	0.14 (bsqreg)
Median QoL (Range)	1 (0-4)	1 (0-2)	1.00 (bsqreg)
Postoperative 3 months			
Median IPSS (Range)	6.5 (0-15)	3 (0-12)	0.06 (bsqreg)
Median QoL (Range)	1 (0-4)	1 (0-2)	1.00 (bsqreg)

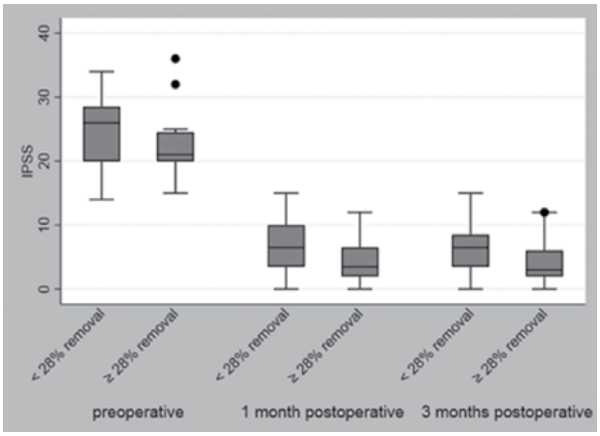


Figure. 1 IPSS of the two study groups at 1 and 3 month

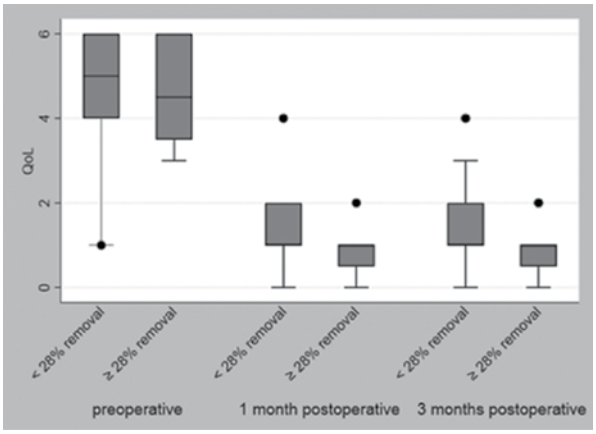


Figure. 2 QoL of the 2 study groups at 1 and 3 months

When the IPSS was analyzed by multivariate analysis using the Mixed Model, the IPSS had decreased by 17.72 at 1 month and 18.05 at 3 months and the IPSS of the patients in group 2 was lower than group 1 by 2.33 (P=0.02). (Table 3)

When the QoL was analyzed by multivariate analysis using the Mixed Model, the QoL score had decreased by 3.56 at 1 month and 3.47 at 3 months (p<0.001). Patients in group 2 had a QoL lower than group 1 by 0.45 (P=0.03). (Table 4)

Discussion

This study shows that the amount of resected prostate tissue has an impact on LUTS. Patients who had more resected prostatic tissue had a greater improvement in LUTS and a better QoL.

For obstructive symptoms, there was an increase in the number of epithelial and stromal cells of the prostate. Furthermore, there were other factors that played important roles, such as dynamic urethral resistance (active smooth muscle contraction), the prostatic capsule, anatomic pleomorphism, and obstruction-induced changes in bladder function.[6]

This study shows that the amount of resected prostate tissue has an impact on the improvement of obstructive symptoms; thus, it can be assumed that anatomic factors such as size of prostate and the prostate's pleomorphism may also play important roles in LUTS. If the anatomic factors can be excluded, and there is no anatomic obstruction after TURP, it would improve LUTS.

For irritative symptoms, it is one of the most common urologic symptoms that leads patients to the doctor. Urinary frequency is due to either increased urinary output (polyuria) or decreased bladder capacity. The obstruction leads to detrusor instability or decreased compliance and is clinically associated with the symptoms of frequency and urgency.[6]

Table 3. Compare IPSS with multivariate analysis using Mixed Model

Variable	Difference of IPSS	95% confidence interval	P value
Group			
Group 2 compared with group1	-2.33	(-4.30) – (-0.37)	0.02
Time (Reference: baseline before TURP)			
1 month	-17.72	(-19.56) – (-15.88)	<0.001
3 month	-18.05	(-19.89) – (-16.21)	<0.001

Table 4. Compare QoL with multivariate analysis using Mixed Model

Variable	Difference of QoL	95% confidence interval	P value
Group			
Group 2 compared with group1	-0.45	(-0.86) – (-0.03)	0.03
Time (Reference: baseline before TURP)			
1 month	-3.56	(-3.96) – (-3.15)	<0.001
3 month	-3.47	(-3.87) – (-3.07)	<0.001

In this study, most patients claimed that frequency and nocturia depended on volume status. Nocturia may also occur in people who drink large amounts of liquid in the evening. Furthermore, aging also produces some of the same changes in bladder function and nocturia. There were 2 patients with significant irritative symptoms (patients had to void every 30 min despite no significant obstructive symptom). The symptoms of these patients did not improve after TURP and they had to take anticholinergic drugs both before and after surgery. This may be due to detrusor instability or decreased compliance caused by the obstruction. For other patients, irritative symptoms improved after TURP. It may be due to the decrease of residual urine after relief of obstruction, prolonging duration during each micturition.

For QoL, it was significantly improved in both groups though slightly better in group 2. If we accessed QoL without the exclusion criteria, such as BPH with vesical calculi or Foley's catheter, it showed that QoL was improved dramatically in patients with Foley's catheter and patients with vesical calculi who had the worst LUTS. The improvement of QoL seems to be related more to preoperative severity and the patient's improvement of the symptoms from BPH than the amount of resected prostate tissue.

When symptoms were compared at 1 month and 3 months, there was a slight improvement of IPSS at 3 months. Some patients still had dysuria and gross hematuria at 1 month. Urinary storage symptoms are a common finding after any BOO procedure wherein the urethral epithelium is disrupted. The raw prostatic fossa takes time to re-epithelialize and the patient will frequently experience symptoms of urgency or dysuria during this time.[7] No patient complained of these symptoms at the 3 month follow-up. Therefore, this might be the cause of the differences in IPSS.

TURP may be associated with bleeding and irrigating fluid absorption. This syndrome is most commonly seen in resections lasting longer than 90 minutes and in those producing more than 45 g of tissue.[10] In medically compromised elderly individuals (hypertension or dilated cardiomyopathy, ischemic heart disease, poor respiratory reserve secondary to chronic obstructive or restrictive disease, and renal insufficiency), standard TURP may carry a greater risk because of the morbidity.

Some methodological limitations of the present study must be considered: only 36 patients were included and most had resected prostate tissue of less than 50%. For evaluation, we used only the IPSS score, which is a subjective measurement for analyzing LUTs. We focused on only short-term outcome and patients with residual prostate gland, LUTS from BPH recurrence.

Conclusion

There is no consensus regarding the amount of prostatic tissue that should be resected during TURP. For patients who have a severe comorbidity and cannot tolerate a prolonged operation, or patients with a large prostate, the operation seems to be time consuming and has a high risk for surgical complications, such as excessive blood loss and TUR syndrome, incomplete resection may be acceptable. Patients would have a significant improvement of LUTS and QoL. The amount of resected prostate tissue had a slight influence on the difference in LUTS and QoL.

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