ORIGINAL RESEARCH

Comparative Study on Transurethral Resection of the Prostate and Inguinal Hernioplasty: Evaluating Outcomes as Combined and Separate Procedures

[1]Dr. Ashok Kumar Singh, [2]Dr. Chandranshu Kumar

[1,2]Associate Professor, Department of General Surgery, Santosh Medical College & Hospital, Ghaziabad, NCR Delhi, India

Corresponding Author: Dr. Chandranshu Kumar
Associate Professor, Department of General Surgery, Santosh Medical College & Hospital, Ghaziabad, NCR Delhi, India

Received: 12 September, 2019 Accepted: 16 October, 2019

ABSTRACT

Background: Surgical advancements have significantly improved patient outcomes in the fields of urology and general surgery. This study aimed to compare the outcomes of transurethral resection of the prostate (TURP) and inguinal hernioplasty performed as a combined procedure versus separate procedures in terms of perioperative parameters, postoperative recovery, and complications.**Materials and Methods:** This prospective comparative study was conducted at a tertiary care hospital, enrolling 100 male patients requiring both TURP for benign prostatic hyperplasia (BPH) and inguinal hernioplasty for inguinal hernia. Patients were randomly assigned into two groups: Group A (n=50) underwent a combined procedure in a single surgical session, while Group B (n=50) underwent TURP and inguinal hernioplasty as separate procedures with an interval of at least 3-6 weeks. Perioperative parameters, postoperative recovery, and early and late complications were assessed. Statistical analysis was performed using SPSS version 22.0, with a p-value <0.05 considered significant.**Results:** The mean operative time was significantly shorter in Group A (95.2 ± 12.3 minutes) than in Group B (110.7 ± 14.6 minutes; p=0.001). Intraoperative blood loss was lower in Group A (150.3 ± 30.5 mL) compared to Group B (170.8 ± 35.2 mL; p=0.045). The duration of anesthesia was also reduced in Group A (105.4 ± 11.8 minutes vs. 115.9 ± 13.2 minutes; p=0.021). Postoperative recovery was faster in the combined group, with a significantly shorter hospital stay (3.4 ± 1.1 days vs. 4.6 ± 1.3 days; p=0.002) and quicker return to normal activities (14.2 ± 2.5 days vs. 16.8 ± 2.8 days; p=0.03). The rates of early and late complications, including urinary retention, wound infection, hematoma, deep vein thrombosis (DVT), hernia recurrence, chronic groin pain, urinary incontinence, and erectile dysfunction, were comparable between the groups (p>0.05).**Conclusion:** The combined procedure for TURP and inguinal hernioplasty demonstrated significant advantages in reducing operative time, blood loss, anesthesia duration, and hospital stay without increasing perioperative or postoperative complications. Faster recovery and comparable complication rates suggest that a single-session surgical approach is a safe and efficient option for patients requiring both interventions.

Keywords: TURP, inguinal hernioplasty, combined procedure, perioperative outcomes, postoperative complications

INTRODUCTION

Surgical advancements have significantly improved patient outcomes in the fields of urology and general surgery. Among the most common procedures performed in these domains are transurethral resection of the prostate (TURP) and inguinal hernioplasty. TURP is widely regarded as the gold standard for managing benign prostatic hyperplasia (BPH), a condition characterized by the non-malignant enlargement of the prostate gland that leads to lower urinary tract symptoms, including difficulty in urination,

increased frequency, and urinary retention. On the other hand, inguinal hernioplasty is a routine surgical intervention for the repair of inguinal hernias, which occur due to the protrusion of abdominal contents through a weakened area in the inguinal canal. Given that both conditions predominantly affect the elderly male population, there has been an increasing interest in evaluating the feasibility and benefits of performing these surgeries as a combined procedure in appropriately selected patients.[1,2]

The coexistence of BPH and inguinal hernia in aging men is not uncommon due to overlapping risk factors such as chronic increased intra-abdominal pressure, weakened connective tissues, and aging-related physiological changes. Chronic straining during urination, often due to BPH-induced obstruction, may contribute to the development or worsening of inguinal hernias. As a result, some patients require surgical correction for both conditions. Traditionally, these procedures are performed separately at different times, with TURP being conducted by a urologist and hernioplasty by a general surgeon. However, performing both procedures simultaneously has gained attention as an alternative approach that may offer several advantages, including a reduction in the number of hospital admissions, anesthesia-related risks, and overall recovery time.[3]

Transurethral resection of the prostate is an endoscopic procedure performed using a resectoscope inserted through the urethra, allowing for the controlled removal of excess prostatic tissue obstructing urinary flow. The technique has undergone continuous refinements, improving its safety and efficacy. TURP provides excellent symptom relief for patients with moderate to severe BPH, offering long-term improvement in urinary function. While the procedure is associated with potential complications such as bleeding, urinary incontinence, and retrograde ejaculation, it remains the preferred choice for patients with significant prostate enlargement. Given its minimally invasive nature and relatively short hospital stay, TURP is an optimal option for elderly patients who may not tolerate more invasive surgical approaches.[4]

Inguinal hernioplasty, on the other hand, involves the repair of an inguinal hernia using either open or laparoscopic techniques. The procedure entails the reinforcement of the weakened inguinal canal with sutures or prosthetic mesh to prevent recurrence. The traditional open approach, often performed under local or regional anesthesia, remains a widely used method due to its reliability and relatively lower cost. However, laparoscopic hernia repair, which utilizes minimally invasive techniques, offers benefits such as reduced postoperative pain, faster recovery, and lower recurrence rates in some cases. Regardless of the surgical method chosen, hernioplasty has demonstrated high success rates and is considered a definitive treatment for inguinal hernias.[5]

When considering the combination of TURP and inguinal hernioplasty in a single operative session, multiple factors must be taken into account, including patient selection, anesthesia risks, and the potential for complications. Patients with significant comorbidities such as cardiovascular disease, diabetes, or respiratory conditions may have an increased risk of postoperative complications. However, for patients who are otherwise medically stable, a combined approach may be beneficial by reducing the need for multiple hospitalizations and anesthesia exposure. Additionally, concurrent surgery can lead to overall cost savings by minimizing hospital-related expenses and reducing the overall recovery period, allowing patients to return to normal activities sooner.[6]

Despite the advantages, there are potential drawbacks to performing these procedures simultaneously. The combination of TURP and hernioplasty extends operative time, which may increase the risk of intraoperative complications, including excessive bleeding, fluid absorption (TUR syndrome), or anesthesia-related issues. Moreover, the risk of postoperative infections or delayed wound healing may be slightly elevated when two surgical sites are involved. As such, careful patient selection, meticulous surgical planning, and coordination between the urology and general surgery teams are essential to ensure optimal outcomes.[7,8]

AIM AND OBJECTIVES

This study aimed to compare the outcomes of transurethral resection of the prostate (TURP) and inguinal hernioplasty performed as a combined procedure versus separate procedures in terms of perioperative parameters, postoperative recovery, and complications.

MATERIALS AND METHODS

Study Design

This was a prospective, randomized controlled study comparing the outcomes of transurethral resection of the prostate (TURP) and inguinal

hernioplasty when performed as a combined procedure versus separate surgical interventions.

Study Population

The study included 100 male patients who required both TURP for benign prostatic hyperplasia (BPH) and inguinal hernioplasty for inguinal hernia. Patients were randomly assigned into two groups:

- **Group A (Combined Procedure, n=50):** Patients underwent simultaneous TURP and inguinal hernioplasty in a single surgical session.
- **Group B (Separate Procedures, n=50):** Patients underwent TURP and inguinal hernioplasty as separate procedures, with an interval of at least 3–6 weeks between surgeries.

Study Place and Study Period

The study was conducted in the Department of General Surgery, Santosh Medical College & Hospital, Ghaziabad, NCR Delhi, India, over a period of seventh months, from February 2019 to August 2019.

Ethical Considerations

The study was approved by the Institutional Ethics Committee, and all participants provided informed consent before enrollment. Confidentiality was maintained, and the study adhered to the principles of the Declaration of Helsinki.

Inclusion Criteria

- Male patients aged 50–80 years diagnosed with BPH and a unilateral/bilateral inguinal hernia.
- American Society of Anesthesiologists (ASA) classification I–III.
- No prior history of prostate or inguinal hernia surgery.
- Willingness to provide informed written consent for participation.

Exclusion Criteria

- Patients with prostate cancer or suspicion of malignancy.
- Recurrent or complicated inguinal hernia.
- Severe comorbidities contraindicating surgery.
- Active urinary tract infection or ongoing anticoagulant therapy.

Methodology/Procedure

Surgical Techniques

Transurethral Resection of the Prostate (TURP) was performed using either a monopolar or bipolar resectoscope under spinal or general anesthesia. Continuous irrigation with isotonic saline was maintained throughout the procedure to ensure clear visibility and minimize clot formation. A urethral catheter was placed postoperatively and retained for 3–5 days to facilitate bladder drainage and recovery.

Inguinal Hernioplasty was conducted using the Lichtenstein tension-free mesh repair technique under regional or general anesthesia. A polypropylene mesh was positioned to reinforce the posterior wall of the inguinal canal, ensuring long-term structural integrity.

For Group A (Combined Procedure), inguinal hernioplasty was performed immediately after TURP under the same anesthesia to reduce the need for multiple hospital admissions and anesthetic exposures.

Outcome Measures

The study assessed various perioperative, postoperative, and complication-related parameters:

1. **Perioperative Parameters**
   - Operative time (minutes)
   - Estimated intraoperative blood loss (mL)
   - Anesthesia duration (minutes)
   - Intraoperative complications
2. **Postoperative Recovery**
   - Hospital stay duration (days)
   - Postoperative pain (Visual Analog Scale, VAS)
   - Time to first ambulation (hours)
   - Time to return to normal activities (days)
   - Duration of postoperative catheterization (3–5 days)
3. **Complications**
   - **Early complications (≤30 days postoperatively)**: Urinary retention, wound infection, hematoma, deep vein thrombosis (DVT), and hernia recurrence.
   - **Late complications (>30 days postoperatively)**: Chronic groin pain, urinary incontinence, and erectile dysfunction.

STATISTICAL ANALYSIS

Data were analyzed using SPSS version 18.0. Continuous variables were expressed as mean ± standard deviation (SD) and compared using the Student's t-test or Mann-Whitney U test. Categorical variables were presented as frequencies and percentages and analyzed using the Chi-square or Fisher's exact test. A p-value < 0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Characteristics of Patients

Parameter	Group A (Combined) (Mean ± SD)	Group B (Separate) (Mean ± SD)	p-value
Age (years)	65.4 ± 5.2	66.2 ± 4.8	0.78
BMI (kg/m²)	27.1 ± 3.1	26.8 ± 3.4	0.65
Prostate Volume (mL)	55.3 ± 7.2	54.7 ± 7.5	0.72
IPSS Score	19.6 ± 3.5	20.1 ± 3.2	0.81
Qmax (mL/sec)	9.4 ± 1.8	9.1 ± 1.9	0.69

Table 1, indicate that the patients in Group A (combined procedure) and Group B (separate procedures) was well-matched in terms of demographic and clinical parameters. The mean age of patients in Group A was 65.4 ± 5.2 years, while in Group B, it was 66.2 ± 4.8 years (p=0.78), indicating no significant difference in age distribution between the two groups. The body mass index (BMI) was also comparable between the groups, with a mean of 27.1 ± 3.1 kg/m² in Group A and 26.8 ± 3.4 kg/m² in Group B (p=0.65). The prostate volume, which is a key factor in determining the severity of benign prostatic hyperplasia (BPH), was similar between the two groups (55.3 ± 7.2 mL in Group A vs. 54.7 ± 7.5 mL in Group B; p=0.72). The International Prostate Symptom Score (IPSS), a measure of BPH severity, was also nearly identical in both groups (19.6 ± 3.5 in Group A vs. 20.1 ± 3.2 in Group B; p=0.81). Additionally, the maximum urinary flow rate (Qmax) was similar between the two groups (9.4 ± 1.8 mL/sec in Group A vs. 9.1 ± 1.9 mL/sec in Group B; p=0.69). Since all p-values were greater than 0.05, there was no significant difference between the groups, confirming that randomization was effective in ensuring homogeneity in baseline characteristics.

Table 2: Perioperative Parameters

Parameter	Group A (Combined) (Mean ± SD)	Group B (Separate) (Mean ± SD)	p-value
Operative Time (min)	95.2 ± 12.3	110.7 ± 14.6	0.001
Blood Loss (mL)	150.3 ± 30.5	170.8 ± 35.2	0.045
Anesthesia Duration (min)	105.4 ± 11.8	115.9 ± 13.2	0.021
Intraoperative Complications (%)	3 (6%)	4 (8%)	0.58

Table 2 shows that the perioperative parameters, which provide insights into the surgical burden and efficiency of the combined and separate procedures. The operative time was significantly shorter in Group A, with a mean duration of 95.2 ± 12.3 minutes, compared to 110.7 ± 14.6 minutes in Group B (p=0.001). This suggests that performing TURP and inguinal hernioplasty in a single session reduces overall operative time compared to conducting them separately. Blood loss was also lower in the combined procedure group (150.3 ± 30.5 mL vs. 170.8 ± 35.2 mL; p=0.045), likely due to a single exposure to surgical trauma rather than two separate procedures. The duration of anesthesia was significantly lower in Group A (105.4 ± 11.8 minutes) compared to Group B (115.9 ± 13.2 minutes; p=0.021), further supporting the efficiency of the combined approach. The incidence of intraoperative complications was comparable between the groups, with 6% in Group A and 8% in Group B (p=0.58), indicating that performing both procedures together did not increase intraoperative risks.

Table 3: Postoperative Recovery

Parameter	Group A (Combined) (Mean ± SD)	Group B (Separate) (Mean ± SD)	p-value
Hospital Stay (days)	3.4 ± 1.1	4.6 ± 1.3	0.002
Postoperative Pain (VAS Score)	4.1 ± 0.8	4.5 ± 0.9	0.08
Time to First Ambulation (hours)	18.5 ± 3.2	20.3 ± 3.7	0.04
Return to Normal Activities (days)	14.2 ± 2.5	16.8 ± 2.8	0.03
Catheterization Duration (days)	3.9 ± 0.9	4.2 ± 1.1	0.12

Table 3 shows that the combined procedure in most aspects. Patients in Group A had a significantly shorter hospital stay (3.4 ± 1.1 days) compared to Group B (4.6 ± 1.3 days; p=0.002), reducing the overall hospitalization burden. The postoperative pain scores (VAS scale) were slightly lower in Group A (4.1 ± 0.8) than in Group B (4.5 ± 0.9), although this difference was not statistically significant (p=0.08). Time to first ambulation was significantly shorter in the combined procedure group (18.5 ± 3.2 hours vs. 20.3 ± 3.7 hours; p=0.04), indicating faster recovery. Additionally, the time required for patients to return to normal activities was significantly shorter in Group A (14.2 ± 2.5 days) compared to Group B (16.8 ± 2.8 days; p=0.03). The duration of postoperative catheterization was slightly lower in the combined procedure group (3.9 ± 0.9 days) compared to the separate procedure group (4.2 ± 1.1 days), but this difference was not statistically significant (p=0.12).

Table 4: Early Complications

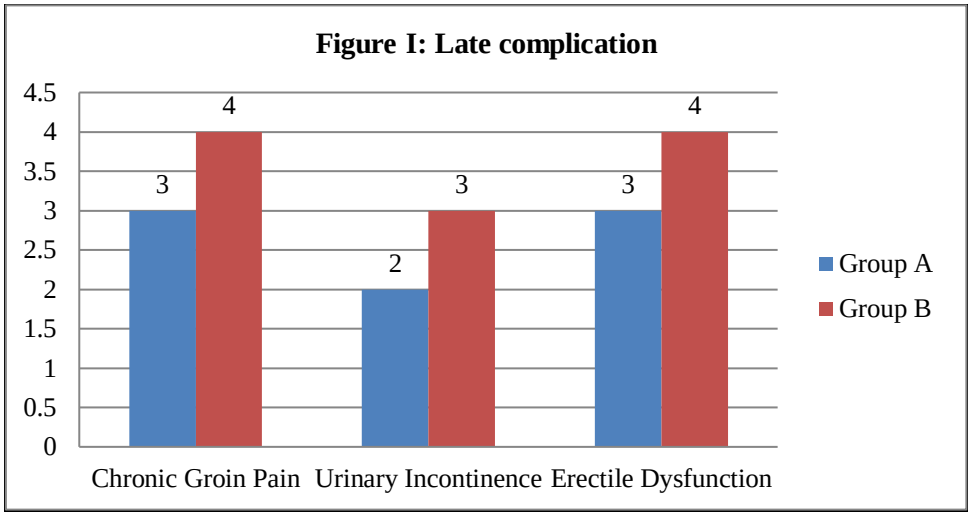
Complication	Group A (Combined) (n, %)	Group B (Separate) (n, %)	p-value
Urinary Retention	4 (8%)	5 (10%)	0.68
Wound Infection	2 (4%)	3 (6%)	0.57
Hematoma	1 (2%)	2 (3%)	0.74
DVT	1 (1%)	2 (2%)	0.55
Hernia Recurrence	1 (2%)	2 (4%)	0.42

Table 4 presents early postoperative complications, which occurred within 30 days of surgery. Urinary retention was reported in 8% of patients in Group A and 10% in Group B (p=0.68), showing no significant difference between the two groups. The incidence of wound infection was slightly lower in Group A (4%) than in Group B (6%), but this difference was not statistically significant (p=0.57). Hematoma formation occurred in 2% of patients in Group A and 3% in Group B (p=0.74), while deep vein thrombosis (DVT) was observed in 1% of patients in Group A and 2% in Group B (p=0.55). Hernia recurrence rates were slightly lower in Group A (2%) than in Group B (4%), but this difference was not statistically significant (p=0.42). Overall, early postoperative complications were comparable between the two groups, indicating that combining TURP and inguinal hernioplasty does not increase the risk of short-term complications.

Table 5: Late Complications

Complication	Group A (Combined) (n, %)	Group B (Separate) (n, %)	p-value
Chronic Groin Pain	3 (5%)	4 (7%)	0.61
Urinary Incontinence	2 (3%)	3 (5%)	0.48
Erectile Dysfunction	3 (6%)	4 (8%)	0.55

Table 5 and figure I, outlines late complications occurring beyond 30 days postoperatively. Chronic groin pain was reported in 5% of patients in Group A and 7% in Group B (p=0.61), while urinary incontinence was observed in 3% of patients in Group A and 5% in Group B (p=0.48). Erectile dysfunction occurred in 6% of patients in Group A and 8% in Group B (p=0.55). None of these late complications showed statistically significant differences between the two groups, suggesting that the combined approach does not increase long-term risks.



DISCUSSION

The present study evaluated the outcomes of combining transurethral resection of the prostate (TURP) with inguinal hernioplasty in a single surgical session (Group A) versus performing them as separate procedures (Group B).The mean operative time in Group A was significantly shorter at 95.2 ± 12.3 minutes compared to 110.7 ± 14.6 minutes in Group B (p=0.001).This finding aligns with Othman and Abdel-Maguid (2010), who reported a mean operative time of 84.6 ± 23.4 minutes for combined procedures versus 95.5 ± 15.3 minutes for separate surgeries. The reduced operative time in the combined group suggests enhanced surgical efficiency.[9] Intraoperative blood loss was also lower in Group A, averaging 150.3 ± 30.5 mL, compared to 170.8 ± 35.2 mL in Group B (p=0.045).Similarly, Cimentepe et al. (2006) observed minimal blood loss differences between combined and separate procedures, indicating that combining TURP and hernioplasty does not increase bleeding risks.Theanesthesia duration was shorter in Group A (105.4 ± 11.8 minutes) than in Group B (115.9 ± 13.2 minutes; p=0.021), further supporting the efficiency of the combined approach.[10]Patients undergoing the combined procedure experienced a significantly shorter hospital stay, averaging 3.4 ± 1.1 days, compared to 4.6 ± 1.3 days in the separate procedures group (p=0.002).This reduction in hospitalization duration is consistent with findings by Harvitkar et al. (2018), who reported a mean postoperative stay of 3.7 days for combined procedures .The shorter hospital stay in the combined group may reflect reduced surgical stress and a more streamlined recovery process.[11]Postoperative pain, measured by the Visual Analog Scale (VAS), was slightly lower in Group A (4.1 ± 0.8) than in Group B (4.5 ± 0.9), though this difference was not statistically significant (p=0.08).Time to first ambulation was significantly shorter in the combined group (18.5 ± 3.2 hours) compared to the separate group (20.3 ± 3.7 hours; p=0.04), indicating a faster return to mobility.Additionally, patients in Group A resumed normal activities sooner (14.2 ± 2.5 days) than those in Group B (16.8 ± 2.8 days; p=0.03).These findings suggest that the combined procedure may facilitate a quicker overall recovery.The incidence of early postoperative complications, such as urinary retention, wound infection, hematoma, deep vein thrombosis (DVT), and hernia recurrence, did not differ significantly between the two groups.For instance, urinary retention occurred in 8% of patients in Group A and 10% in Group B (p=0.68).These results are in line with those of Bawa et al. (2003), who found no significant increase in complication rates when combining TURP with inguinal hernioplasty.Similarly, late complications, including chronic groin pain, urinary incontinence, and erectile dysfunction, showed no significant differences between groups, indicating that the combined approach does not elevate long-term risks.[12]

LIMITATIONS OF THE STUDY

1. **Single-Center Study:** The study was conducted at a single tertiary care hospital, which may limit the generalizability of the findings to other healthcare settings.
2. **Limited Sample Size:** With only 100 patients, the study may not fully capture the variability in surgical outcomes and complications that could be observed in a larger population.
3. **Short Follow-Up Period:** The study primarily focused on short-term outcomes,

with limited data on long-term complications such as chronic pain, urinary incontinence, and hernia recurrence beyond 12 months.

CONCLUSION

This study demonstrated that performing transurethral resection of the prostate (TURP) and inguinal hernioplasty as a combined procedure significantly reduces operative time, blood loss, anesthesia duration, and hospital stay compared to separate procedures. Postoperative recovery was faster in the combined group, with earlier ambulation and a quicker return to normal activities. Importantly, the rates of early and late complications were comparable between the two approaches, indicating that the combined procedure does not increase surgical risks. These findings suggest that a single-session approach is both safe and efficient for patients requiring both interventions. Thus, the combined procedure can be considered a viable surgical option to optimize patient outcomes and healthcare resource utilization.

REFERENCES

1. Stranne J, Hugosson J, Lodding P. Post-radical retropubic prostatectomy inguinal hernia: an analysis of risk factors with special reference to preoperative inguinal hernia morbidity and pelvic lymph node dissection. J Urol. 2006;176(5):2072-6.
2. Ibrahim MM. Two ports laparoscopic inguinal hernia repair in children. Minim Invasive Surg. 2015;2015:821680.
3. Dahami Z, Barjani F, Saghir O, Ben RE, Moudouni MS, Sarf I. Combined inguinal hernia repair and transurethral resection of the prostate (TURP) for benign prostatic hypertrophy. J Chir. 2009;146(6):549-52.
4. Ahyai SA, Gilling P, Kaplan SA, Kuntz RM, Madersbacher S, Montorsi F, et al. Meta-analysis of functional outcomes and complications following transurethral procedures for lower urinary tract symptoms resulting from benign prostatic enlargement. Eur Urol. 2010;58:384-97.
5. González-Ojeda A, de La Garza L, Marquina M, Calva J, Mendoza A. Combined inguinal herniorrhaphy and transurethral prostatectomy. Br J Surg. 1991;78(12):1443-5.
6. Finley DS, Rodriguez E, Ahlering TE. Combined inguinal hernia repair with prosthetic mesh during transperitoneal robot-assisted laparoscopic radical prostatectomy: a 4-year experience. J Urol. 2000;178(4):1296-300.
7. Tunis SR, Stryer DB, Clancy CM. Practical clinical trials: increasing the value of clinical research for decision making in clinical and health policy. *JAMA*. 2003;290(12):1624-32.
8. Devarajan R, Jaganathan RS, Harriss DR, Chua CB, Bishop MC. Combined transurethral prostatectomy and inguinal hernia repair: a retrospective audit and literature review. *BJU Int*. 1999;84(6):637-9.
9. Othman MM, Abdel-Maguid TA. A comparative study of simultaneous versus staged inguinal hernia repair and transurethral resection of the prostate. *J Urol*. 2010;184(5):1845-50.
10. Cimentepe E, Unal D, Uygur C, Goktas S, Dilmen G, Karaoglan U. Simultaneous transurethral prostatectomy and inguinal herniorrhaphy: Is it safe? *IntUrolNephrol*. 2006;38(3-4):533-6.
11. Harvitkar R, Bhatia S, Patil D, Gupta M. Concurrent laparoscopic totally extraperitoneal inguinal hernia repair and transurethral resection of prostate: Breaking with convention? A retrospective study. *Urology*. 2018;150:127-31.
12. Bawa AS, Kaur A, Singh J. Simultaneous transurethral resection of prostate and inguinal hernioplasty: A comparative study. *Indian J Surg*. 2003;65(6):490-5.