

# Efficacy of prostatic urethral lift compared with transurethral resection of the prostate

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## ABSTRACT

This article reviews the prostatic urethral lift (PUL) and its potential benefits and risks compared with transurethral resection of the prostate (TURP). TURP is the traditional procedure for benign prostatic hyperplasia (BPH), and is associated with ejaculatory and erectile dysfunction. PUL is a minimally invasive option, but its efficacy has not been well studied. A literature review indicates that both procedures should be afforded equal consideration, and both have limitations. Further long-term research is needed to establish if PUL is superior to TURP.

**Keywords:** prostate, benign prostatic hyperplasia, prostatic urethral lift, PUL, transurethral resection of the prostate, TURP

## Learning objectives

- Define PUL and how the procedure compares with TURP.
- Identify negative outcomes to both PUL and TURP.
- Identify candidates for PUL.

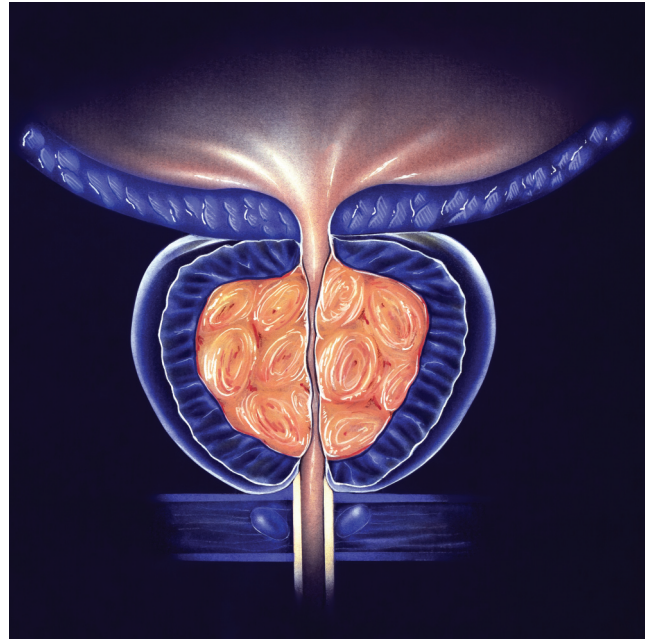
Benign prostatic hypertrophy (BPH) is associated with aging, and in most men the prostate increases in size without noticeable symptoms.<sup>1</sup> In 30% of men over age 50 years, BPH can lead to lower urinary tract symptoms (LUTS), including benign but irritating symptoms such as weakened urinary stream, increased nocturia, and urinary urgency.<sup>1,2</sup> Other complications of BPH include urinary retention, urinary tract infections, and prostatic bleeding.<sup>2</sup>

Treatments for LUTS secondary to BPH depend on the severity of symptoms and patient preference. Options range from medications such as tamsulosin, which relaxes and opens the prostatic urethra, to surgical prostatectomy.<sup>1</sup> Medications used for BPH typically are alpha-blockers (such as tamsulosin), 5-alpha reductase inhibitors (such

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as finasteride, which cause involution of prostate cells), and more recently phosphodiesterase inhibitors (PDE inhibitors, such as tadalafil, traditionally used for erectile dysfunction but which have been found to improve LUTS when taken on a daily basis).<sup>3</sup> Alpha-blockers typically cause adverse reactions such as dizziness and retrograde ejaculation; finasteride can lead to decreased libido and breast tenderness.<sup>3</sup> Efforts have been made to create medications with a higher affinity for alpha-1A receptors, which are found predominantly in the male bladder outflow tract.<sup>4</sup> Other alpha-receptors found in the brain and periphery are not targeted, thus reducing unwanted adverse reactions such as dizziness or hypotension, which are common reactions to nonselective alpha-blockers such as tamsulosin.<sup>4,5</sup> Despite this effort, two such medications, naftopidil and silodosin, have been found in meta-analyses to yield no significant improvement in urologic symptom scores when compared with tamsulosin.<sup>4</sup>

Although medications are the first-line treatment for BPH, studies have found that they have long-term negative effects.<sup>2</sup> Alpha-1 receptors in the brain play an important role in cognition and long-term use of alpha-blockers poses

### Key points

- BPH affects 30% of men over age 50 years.
- TURP is associated with ejaculatory and erectile dysfunction, but has remained the standard surgical option for BPH with LUTS.
- PUL is a recent minimal invasive option for BPH.
- Recent studies comparing PUL with TURP have noted a shorter recovery time and less ejaculatory and erectile dysfunction for patients who had PUL.

an increased risk for poor cognition and eventual dementia.<sup>6</sup> Because of this concern, urologists have been moving toward procedures rather than medications.<sup>2,6</sup>

When medication fails, the next step is to consider procedures. Transurethral resection of the prostate (TURP) consists of resection of prostatic tissue that encroaches into the prostatic urethra.<sup>7</sup> TURP has been the gold standard procedure for LUTS associated with BPH for decades, but is associated with ejaculatory and erectile dysfunction, and 20% of patients need to restart medication within 3 years of the procedure.<sup>8</sup> Other complications associated with TURP include urethral stricture, infection, bleeding requiring transfusion, and urinary incontinence.<sup>8</sup>

Prostatic urethral lift (PUL), created in 2004, is a minimally invasive option for men with LUTS as a result of BPH and does not involve blunt resection.<sup>9</sup> The procedure consists of permanent implants placed transurethally into both prostatic lobes, causing compression of lobes and widening of the prostatic urethra (**Figure 1**).<sup>10</sup> PUL is rela-

tively new to the urologic community, with the first data published on the procedure in 2011.<sup>10</sup> The literature provides little evidence about the efficacy of the procedure and if outcomes are superior to those of traditional TURP.<sup>11</sup> This article reviews the long-term outcomes and risks associated with PUL and TURP.

### METHODS

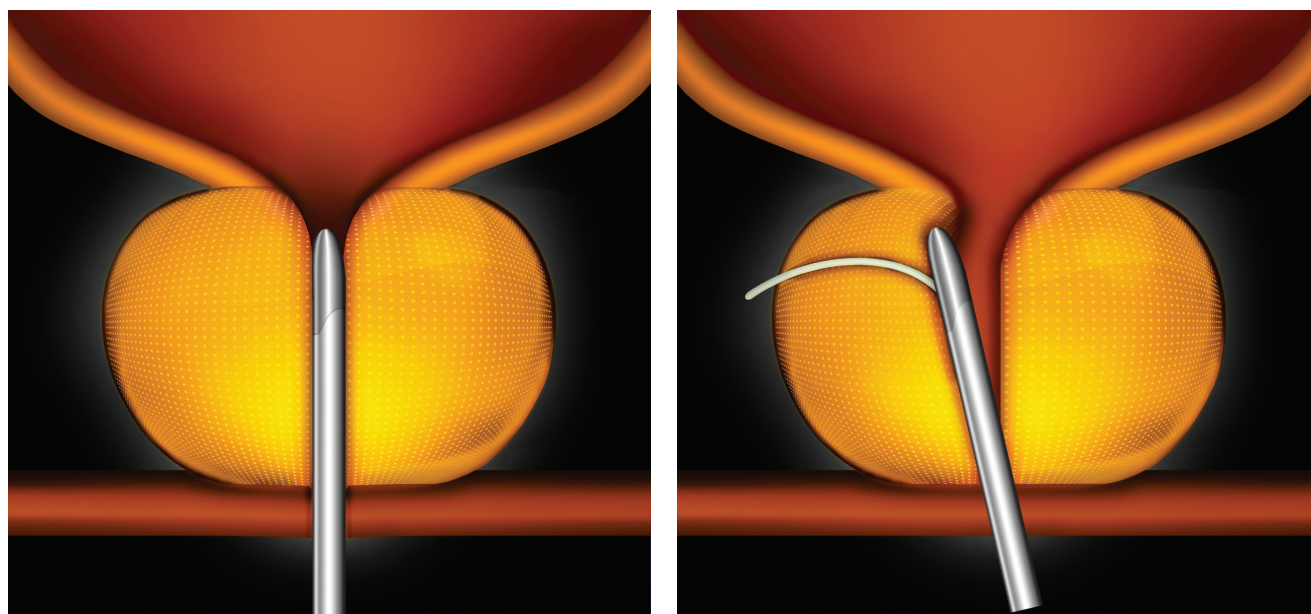
A PubMed and Cochrane library literature search was conducted with search terms men, BPH, PUL, TURP, and LUTS. Advanced filters were used to specify sex (male), age (greater than 50 years), publication date (2015-2019), therapy (high sensitivity), and type of trial (randomized controlled). Age greater than 50 years was chosen because one in three men in this age range has LUTS due to BPH. Sixteen articles of relevance were found and reviewed and serve as the basis for this clinical review.

### DISCUSSION

One of the first studies of PUL was the Luminal Improvement Following Prostatic Tissue Approximation for the Treatment of Lower Urinary Tract Symptoms (LIFT) study, which followed 206 men who were randomized between PUL versus sham procedure over a 5-year period, at a ratio of two PUL procedures for every sham procedure.<sup>12-14</sup> (A sham procedure is one in which the patient is instrumented and the instrument makes sounds as if implants are being placed, but no implants are placed. The patient is unaware if he did or did not receive the treatment.)<sup>12</sup> The LIFT study did not directly compare PUL with TURP, but offers insight as to whether PUL is

**FIGURE 1.** The PUL procedure consists of permanent implants placed transurethally into both prostatic lobes, compressing the lobes and widening the prostatic urethra

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beneficial compared with a control group. More specifically, does PUL cause harm or complications when compared with no procedure at all? The LIFT study found that patients who had PUL had a higher percentage of improvement in quality of life and greater reduction of urinary symptoms compared with patients who underwent a sham procedure (Table 1).<sup>12-14</sup>

The BPH6 study consisted of 80 patients randomly assigned to TURP or PUL groups.<sup>1,15</sup> Patients were followed for 2 years to determine short-term (12-month) and long-term (24-month) outcomes.<sup>1</sup> Short-term findings focused on recovery measures of both surgeries and found that patients who had TURP required an indwelling urinary catheter for a longer time, had longer hospital stays, and had increased incontinence compared with patients who had PUL. Patients who had TURP had a larger improvement in International Prostate Symptom Score (IPSS) compared with those who had PUL (Table 2).<sup>1</sup> At 1 month postprocedure, 82% of patients who had PUL reported full recovery, compared with 53% of patients who had TURP.<sup>15</sup> Long-term findings focused on postprocedural urinary and sexual function. Patients who had TURP had greater improvement to urinary flow compared with patients who had PUL. Erectile function was preserved in 100% of the patients who had PUL, but in only 64% of patients who had TURP.<sup>15</sup> More patients

who had PUL required a second procedure (13.6%) compared with those who had TURP (5.7%), due to recurrence of LUTS.<sup>15</sup>

In a minor German study, 212 candidates for TURP were given the option of TURP or PUL.<sup>16</sup> Eighty-six chose the new PUL option. Within 1 month after PUL, 74 patients (86.05%) noted substantial symptom relief, but 11 (12.79%) patients required retreatment within the 2-year follow-up.<sup>16</sup> In this study, 14 patients had a chronic indwelling urinary catheter, which was an exclusion criterion for initial PUL studies, such as LIFT, but these patients were included in this later German study. Of the 14 patients who underwent PUL who initially had a chronic indwelling urinary catheter, 12 were catheter-free within 1 month post-PUL and remained without the need of a chronic urinary catheter until the 2-year follow-up.<sup>16</sup> This study, although not blinded or randomized, found that patients with complicated LUTS who typically are excluded from initial trials (BPH6 and LIFT) may have success with PUL.

Other new research in the United States and Australia shows that patients with complicated BPH and LUTS had positive outcomes similar to the German study. Gange and Rochester discussed 1,423 cases in the United States and Australia that did not fit the initial LIFT study criteria (younger than age 55 years, past prostate cancer treatments, prostates larger than 80 g, prostates smaller than 30 g) and those with urinary retention, respectively, were still found to have similar outcomes compared with patients in the LIFT study.<sup>17,18</sup> Specifically, Rochester found that 58% of patients with chronic urinary retention had a successful voiding trial within 3 days after undergoing PUL and 79% were catheter-free within 3 months.<sup>18</sup>

Meta-analyses comparing PUL with sham procedures or TURP have pointed out the lack of reported information on adverse reactions when discussing PUL.<sup>19</sup> The literature also lacks extended long-term effects past the 5-year mark, which is pertinent information for anyone considering undergoing a procedure.

**TABLE 1.** Comparing PUL to sham procedure at 5-year follow-up in the LIFT study<sup>12-14</sup>

Measure	% improvement for PUL	% improvement for sham procedure
IPSS	35.9	5.9
Quality of life	50.3	1
Peak flow rate (mL/second)	44.3	1.98
BPH impact index	55.7	11
Male Sexual Health Questionnaire for Ejaculatory Dysfunction	9.3	2

**TABLE 2.** Comparing patients who had PUL with those who had TURP at 12 months<sup>1</sup>

Measure	PUL	TURP
Catheter for more than 24 hours	45%	74%
Average hospital stay (days)	1	1.9
Average return to normal activity (days)	11	17
Incontinence	0%	75%
Ejaculatory function	100%	60.6%
Second procedure needed	0%	6%
IPSS improvement (points)	11.4	15.4

**CONCLUSION**

As with any new procedure, PUL faces questions about its safety, efficacy, and whether it is an improvement over the current options. Early data note a minimal to moderate improvement in IPSS scores and quality of life as well as reduced ejaculatory dysfunction. Compared with patients undergoing TURP, those undergoing PUL have an increased likelihood of needing a repeat procedure within 2 years.<sup>15</sup> Comparing PUL with TURP is important in order to identify appropriate patients for both procedures and increase clinicians' ability to help patients make an educated treatment decision. If more research on PUL were conducted, urology clinicians might be more likely to consider the procedure. **JAAPA**



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