Research Article

Post-TURP Urethral Stricture Cases in Jakarta: A Survey-Based Study on Urologists' Clinical Experience

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Abstract

Urethral stricture is a common late complication after transurethral resection of the prostate (TURP) procedure, but the incidence is varied. The objective of this study was to explore urologists' general clinical practices in performing TURP and to identify reported occurrences of post-TURP urethral strictures and associated procedural factors, based on a regional survey of urologists. This cross-sectional study used a self-designed online questionnaire, targeting all registered urologists in Jakarta and several surrounding areas. A total of 73 urologists completed the questionnaire. In Jakarta, the number of post-TURP stricture cases reported by individual urologists ranged from 2 to 10 cases annually. Most urologists performed a low number of TURP procedures (43.8%), with the majority completing the procedure in less than 60 minutes (89%). A German-manufactured resectoscope was predominantly used (87.7%), along with monopolar energy (76.7%), and warm irrigation was generally not employed (94.5%). The postoperative catheter dwelling time was predominantly 3–7 days (78.1%). Most respondents (86.3%) reported having encountered at least one post-TURP urethral stricture during their practice. Most strictures were located in the bulbomembranous urethra (68.5%) and were primarily managed using internal urethrotomy (61.9%). In conclusion, although exact incidence rates were not determined, most urologists in Jakarta reported experience with post-TURP stricture cases. Internal urethrotomy and urethral dilation were the most reported treatment methods, although treatment outcomes remain unclear.
Keywords*: urethral stricture, iatrogenic, transurethral resection of prostate.*

Kasus Striktur Uretra Pasca TURP di Jakarta: Penelitian Berbasis Survei Berdasarkan Praktik Klinis Dokter Spesialis Urologi

Abstrak

Striktur uretra merupakan komplikasi yang cukup sering terjadi setelah tindakan TURP, akan tetapi angka kejadiannya sangat bervariasi. Penelitian ini bertujuan untuk mengetahui gambaran praktik klinis ahli urologi dalam melakukan prosedur TURP serta mengidentifikasi kejadian striktur uretra pasca-TURP yang dilaporkan beserta faktor prosedural yang mungkin terkait, berdasarkan survei regional terhadap para ahli urologi. Desain penelitian potong-lintang digunakan dengan kuesioner online yang melibatkan seluruh ahli urologi terdaftar di Jakarta dan beberapa wilayah sekitarnya. Sebanyak 73 ahli urologi mengisi kuesioner tersebut. Jumlah kasus striktur uretra pasca-TURP yang dilaporkan 2-10 kasus per tahun di kalangan ahli urologi di Jakarta. Sebagian besar ahli urologi menangani kasus TURP dengan jumlah rendah (43,8%), dan sebagian besar prosedur dilakukan dalam waktu <60 menit (89%). Sebagian besar menggunakan resektoskop buatan Jerman (87,7%), menggunakan energi monopolar (76,7%), dan tidak menggunakan irigasi hangat (94,5%). Waktu tinggal kateter pasca-operasi sebagian besar adalah 3-7 hari (78,1%). Sebagian besar ahli urologi pernah mengalami striktur uretra pasca-TURP selama karirnya (86,3%). Sebagian besar striktur terletak di bagian bulbo membranosa (68,5%) dan ditangani dengan uretrotomi internal (61,9%). Disimpulkan, sebagian besar ahli urologi di Jakarta melaporkan pernah menangani kasus striktur uretra pasca-TURP. Kebanyakan ahli urologi melakukan dilatasi uretra dan uretrotomi internal untuk mengatasi striktur uretra pasca TURP dengan hasil yang tidak diketahui.
Kata kunci*: striktur uretra, iatrogenik, reseksi prostat transuretral.*

Introduction

Transurethral resection of the prostate (TURP) remains the treatment of choice for benign prostatic hyperplasia (BPH). It is considered the gold standard against which all other surgical therapies for BPH are compared.[1] Over the past decade, several advancements have been introduced to enhance the safety of benign prostatic enlargement (BPE) treatment, including adopting bipolar technology in TURP. Numerous randomized controlled trials have evaluated the perioperative and postoperative morbidity, as well as the outcomes, of bipolar TURP (B-TURP). These studies consistently report that the clinical efficacy of B-TURP is comparable to that of monopolar TURP (M-TURP). However, the incidence of complications such as urethral stricture and other issues associated with B-TURP remains controversial.[2–5]

Any inflammation of the urethra can lead to scarring, which may result in urethral stricture or narrowing. Besides prostate surgery, other causes of urethral stricture include trauma, infections, tumors, and any condition that induces urethral scarring.[6] Compared to other regions in Indonesia, healthcare facilities in Jakarta are considered more advanced. This has led to the perception of lower complication rates following medical procedures, including those in the field of urology. However, no study has specifically described cases or contributing factors of complications following TURP in this region. Therefore, the objective of this study was to investigate the reported occurrence of post-TURP urethral strictures and their potential associated factors, based on a regional survey of practicing urologists.

Methods

The present study employed a cross-sectional design using a self-developed online questionnaire (Google Form) distributed to all registered urologists in Jakarta and several surrounding regions. An online survey using the Google Forms platform was initially developed in Indonesian. The survey was piloted with a small group of urologists from our institution and revised based on their feedback. Following this, the survey was distributed to members of the Indonesian Urological Association – Jakarta Chapter (*Ikatan Ahli Urologi Indonesia Jakarta Raya*, IAUI JAYA) after obtaining approval from the Institutional Review Board (IRB). The anonymous online survey invitation was emailed to IAUI JAYA members in mid-August 2022, followed by two personalized reminders through WhatsApp messages sent three and five weeks after the initial invitation. The survey included questions regarding urologists' demographic characteristics, clinical practices related to TURP, the frequency of post-TURP urethral stricture, and several potentially associated procedural factors.

Data were analyzed to assess the average number of post-TURP urethral stricture cases reported by urologists in Jakarta, based on their clinical experience. The demographic characteristics of the urologists were summarized and grouped based on the number of post-TURP stricture cases encountered (<5 and >5 cases). All statistical analyses were performed using IBM SPSS Statistics for Mac, version 26.

Results

This is the first study to investigate the number of post-TURP urethral stricture cases reported by urologists in Jakarta, Indonesia. A total of 155 urologists in Jakarta were invited via email to complete the survey, of whom 73 responded between August and September 2022. Most respondents were general urologists (93.2%), while only two (2.7%) identified as reconstructive urologists. In our study, most respondents (47.9%) practiced in private hospitals, and 42.5% had more than 10 years of urologist experience (Table 1).

Data on TURP clinical practice were collected, including the monthly number of TURP cases, duration of the procedure, type of device/resectoscope used, energy modality, duration of post-operative catheterization, irrigation temperature, lubricant reapplication during prolonged procedures, and the number of post-TURP urethral stricture cases encountered. Most urologists performed low-volume TURP

(43.8%); in most cases, the procedure was completed in under 60 minutes (89%). While the reported TURP duration reflects general practice patterns rather than being specific to cases resulting in strictures, it may indicate procedural trends relevant to future risk assessments. The majority of urologists used resectoscopes manufactured in Germany (87.7%), utilized monopolar energy (76.7%), and did not apply warm irrigation (94.5%). The post-operative catheter dwelling time was generally 3–7 days (78.1%). Most respondents (86.3%) reported having encountered at least one post-TURP urethral stricture during their clinical careers. (Table 1).

Table 1. Respondent and Stricture Characteristics

Characteristics	n	%
Respondents, (n=73)		
Subspecialty		
Yes	5	6.8
No	68	93.2
Hospital		
Public	17	23.3
Private	35	47.9
Both	21	28.8
Working experience		
≤ 5 years	24	32.9
6-10 years	18	24.7
>10 years	31	42.5
Clinical practice of TURP, (n=73)		
TURP procedures (monthly)		
1-5 cases (low volume)	32	43.8
6-10 cases (medium volume)	26	35.6
>10 cases (high volume)	15	20.5
TURP duration		
<60 minutes	65	89
>60 minutes	8	11
Device manufacturer		
Germany	64	87.7
Japan	5	6.8
China	4	5.5
Energy		
Monopolar	56	76.7
Bipolar	16	21.9
Laser evaporation	1	1.4
Post-operative catheter dwelling time		
< 3 days	15	20.5
3-7 days	57	78.1
>7 days	1	1.4
Warm irrigation		
Yes	4	5.5
No	69	94.5
Lubricant reapplication		
Yes	40	54.8
No	33	45.2
Post-TURP stricture occurrence		
Yes	63	86.3
No	10	13.7
Stricture, (n=63)		
Post-TURP stricture location		
Meatal stenosis	20	31.7
Pendulous	7	11.1
Bulbomembranous	52	68.5
Treatment of Post-TURP stricture		
Dilatation	37	58.7
Internal urethrotomy	39	61.9
Urethroplasty	3	4.7

The condition was reported to be relatively rare among respondents who had encountered post-TURP urethral stricture cases. The median (range) number of post-TURP urethral stricture cases reported per year was 2 (2–10). Respondents were instructed to report only those urethral stricture cases that developed in patients who had undergone TURP procedures performed by the respondents themselves. However, due to the self-reported nature of the survey, it remains possible that in some cases, the initial TURP procedure was initiated by a different operator. This limitation should be considered when interpreting the reported cases. Respondents were also asked about the anatomical location of post-TURP strictures and the treatment modalities used. Multiple answers were permitted for these questions. Among those who had encountered strictures, 68.5% reported the bulbomembranous urethra as the most frequently affected site, and internal urethrotomy was the most used treatment (61.9%).

We presented the demographic characteristics of the urologists and categorized the number of post-TURP urethral stricture cases they had encountered during clinical practice into two groups: fewer than 5 cases and more than 5 cases. This classification was based on the distribution of responses to facilitate a more precise representation of variations in clinical practice. We then analyzed the number of reported post-TURP urethral stricture cases about potential associated factors, including years of clinical experience, resectoscope manufacturer, type of energy used, catheter duration, use of warm irrigation, procedure duration, and lubricant reapplication (Table 2).

Table 2. Characteristics of Reported Post-TURP Stricture Cases by Urologists

Characteristics	Annual Urethral Stricture Frequency		Total (n=63)
	<5 cases (n=58)	≥5 cases (n=5)	
Urologists' working experience			
≤ 5 years	17	2	19
6-10 years	15	1	16
>10 years	26	2	28
Device manufacturer			
Germany	50	5	55
Japan	5	0	5
China	3	0	3
Energy			
Monopolar	43	5	48
Bipolar	15	0	15
Laser evaporation	0	0	0
Length of Catheter Use			
<3 days	13	0	13
3-7 days	45	4	49
>7 days	0	1	1
Warm irrigation			
No	55	5	60
Yes	3	0	3
TURP duration			
< 60 minutes	52	5	57
> 60 minutes	6	0	6
Lubricant reapplication			
Yes	32	3	35
No	26	2	28

Discussions

Post-TURP Urethral Stricture Characteristics

Based on the results, the number of post-TURP urethral stricture cases reported by urologists was relatively low in Jakarta, the capital city of Indonesia, where the facilities and resources are advanced compared to other cities. This concurs with the available evidence that the frequency of urethral stricture after TURP is relatively low, ranging from 2 to 10 per cent.[7,8] However, most urologists (84%) have had a post-TURP stricture case in their career. This finding showed that post-TURP stricture is a common disease among urologists, so they should know how to manage post-TURP urethral stricture.

In this study, most post-TURP strictures were located in the bulbomembranous part of the urethra, followed by the meatal and pendulous parts. Other studies found that post-TURP strictures were primarily found in the bulbar urethra. [9, 10] Tan et al. stated that the orientation of the return current flow in the TURP system may have caused the occurrence of urethral stricture after TURP.

Risk Factors

Most urologists (89%) in Jakarta performed the TURP surgery within 60 minutes, but post-TURP stricture in this group was relatively high (87.6%). This is different from other evidence that stated prolonged operating time is associated with the occurrence of urethral stricture.[11-14] A significantly higher risk of urethral stricture was observed following TURP procedures lasting more than 60 minutes.[14] The prolonged use of a resectoscope causes subepithelial fibrosis by inducing urethral inflammation and ischemia in the urethral mucosa, causing mucosal damage and increasing the likelihood of urethral stricture after TURP.[12]

B-TURP is becoming more commonly used for treating BPE since it has a lower rate of complications than M-TURP.[1] Some research suggests that the risk of developing urethral stricture is greater with BTURP than with monopolar TURP (MTURP).[15-18] The current study showed a higher volume (>5 cases) of post-TURP stricture in monopolar-TURP compared to B-TURP and laser evaporation. However, a randomized controlled trial compared the B-TURP and M-TURP and showed no difference in urethral stricture incidence between the two methods.[19]

Most urologists (54.5%) reapplied the lubricant when the TURP procedure lasted more than 60 minutes. However, the results of post-TURP urethral stricture were similar between the two groups. Theoretically, applying a lubricant with proper conductivity prevents harmful current surges in the urethral region. When used to reduce mechanical stress on the urethra, the consistency and amount of lubricant utilized and the frequency of administration are crucial.[20]

In this study, the use of warm irrigation solutions was relatively low (5.5%). Based on previous studies, a warm irrigation temperature during the TURP procedure was a protective factor for post-TURP stricture. In a retrospective investigation, Park et al investigated the effects of irrigation solution temperature on the incidence of urethral stricture after TURP. Patients were divided into two groups, one with warm (36°C) and the other with room temperature (20°C) irrigation solution. Six months after the procedure, the urethral stricture incidence in the room temperature group was 21.3% as opposed to just 6.3% in the warm irrigation group. Cool irrigation induces vasoconstriction and may predispose to urethral stricture development.[21] The longer that a catheter is in place, the greater its association with the development of urethral strictures

This study observed a higher volume of post-TURP stricture cases in 3 to 7 days and more than 7 days of post-operative catheter use compared to less than 3 days. Afandiyev et al.[10] found that prolonged post-operative catheterization is statistically significant, with a higher risk of urethral stricture development. Similar findings were also found in a study by Guerrero et al.[22] They found that the duration of catheterization was significantly associated with the development of urethral stricture. They discovered a 0.7% risk of the stricture with catheter usage for 2 days, a 3% risk with catheter use for 5 days, and a 46% risk with catheter use for 12 days.

Treatment of Post-TURP Stricture

Most urologists in Jakarta performed internal urethrotomy (61.7%) and dilatation (58.7%) as the primary management of post-TURP urethral stricture. Thus, general urologists in Jakarta used minimally invasive procedures more frequently than urethroplasty techniques. Several surveys found similar findings that general urologists used minimally invasive procedures more frequently than urethroplasties in managing urethral stricture.[23-25] Inexperience with urethroplasty surgery has made endoscopic techniques excessively prevalent.[24] As per many guidelines, reconstructive surgery is the definitive management of post-TURP urethral stricture. Thus, a national urethral stricture management guideline and more urethroplasty experience for urethral stricture management and more experience in urethroplasty during urology residency are needed.

Limitations

There were several limitations of our study. This was an online survey-based study that was strongly related to recall bias. The information was inaccurate because it was based on the survey results, rather than actual data from medical records. Due to the limited data available, the association analysis could not be performed in this study. Other studies have investigated factors associated with urethral stricture following TURP, such as infection, electrical current leakage, resectoscope caliber, preoperative urethral dilation, and preoperative urethral catheter placement. However, our study could not analyze these variables due to limitations inherent in the survey data. One notable limitation is the reliance on self-reported cases by urologists, which may have included strictures not directly resulting from their surgical interventions. Although respondents were instructed to report only cases within their scope of practice, the retrospective nature of the survey limits the ability to verify this distinction. Additionally, because of the survey-based design, exact incidence rates could not be determined. Therefore, further prospective studies are warranted to more accurately assess the prevalence of post-TURP urethral strictures and risk factors.

Conclusion

In conclusion, while exact incidence data could not be determined, most urologists surveyed reported having encountered post-TURP urethral strictures, predominantly located in the bulbomembranous urethra. Most urologists performed urethral dilation and internal urethrotomy to treat post-TURP urethral stricture; however, the outcomes were unknown. However, these findings should be interpreted cautiously due to the limitations of self-reported data and potential biases. Further prospective cohort studies in patients undergoing TURP are needed to identify associated risk factors. A consensus on post-TURP urethral stricture management is required to ensure appropriate patient treatment.

Conflict of Interests

The authors declare that they have no conflicts of interest.

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