

The Recurrence of Stricture in Postoperative Patients at Dr. Soetomo Hospital from 2013-2017: A Case-Control Study

I Dewa Gede Reza Sanjaya^{1*}, Fikri Rizaldi^{2, 3}, Johan Renaldo^{2, 3}

¹. Urology Program Study, Medical Faculty of Universitas Airlangga, Surabaya, East Java, Indonesia.

². Urology Department of Dr. Soetomo Hospital, Surabaya, East Java, Indonesia.

³. Urology Department, Medical Faculty of Universitas Airlangga, Surabaya, East Java, Indonesia.

***Corresponding Author: I Dewa Gede Reza Sanjaya**

Abstract

Background: Urethral stricture is one of urology disease that commonly occurs in men with the incidence increase above 54 years old. Urethroplasty was an effective management option for almost all types of stricture and remained as the gold standard. Recurrence of stricture is one of complication that can occur after operative treatment. Methods: A case-control study with secondary data of all patients treated and undergoing operative management of the anterior-posterior urethral stricture in Dr. Soetomo Hospital from January 2013 to December 2017. Diabetes mellitus, hypertension, urine culture, and previous history of sachse were as independent variables. The data described by the distribution table and continued by Chi-square test using the SPSS application. P-value <0.05 showed significant. Results: Total of 117 samples divided into 53 samples as case groups. The mean age was 44.58 ± 18.08 . Most of the samples were male (94.9%), and 41.9% had previous sachse history. Only 13.7% had diabetes mellitus and 27.4% in hypertension. Iatrogenic as most common aetiology and pars membranous was the most common location of stricture. Positive urine culture occurs in 53% of the sample. Mean length of the stricture was 1.43 ± 1.27 cm. The recurrence rate was 6.98 ± 2.67 months. There were significant relationships between diabetes mellitus (OR=6.608; p=0.002), urine culture (OR=15.551; p<0.001), and previous sachse surgery history (p<0.001) with the recurrence of urethral stricture. But there was no significant relationship between hypertension and recurrence of stricture. Conclusion: There is a significant relationship between diabetes mellitus comorbid, positive urine culture, history of sachse on the recurrence of urethral stricture.

Keywords: Urethral stricture, Recurrence, Postoperative.

Introduction

Urethral stricture is one of the various diseases in the urology that is often found in men due to various etiologies and influenced by socioeconomic. The incidence rate of urethral stricture is estimated around 200/100,000 and the incidence increases at age more than 54 years old [1]. The a etiology of anterior urethral stricture is subcategorized based on it's a etiology to be iatrogenic, traumatic, inflammatory and idiopathic.

Previous meta-analysis study found those 732 patients with urethral stricture, the most common caused by idiopathic and iatrogenic, 33% and 33% in each. Meanwhile, the cause of inflammation and post-trauma is only found 15% and 19% of all patients [2].

Commonly there are 3 types of treatment that can be applied to patients with urethral stricture. Urethral dilatation, endoscopic management (urethrotomy) and urethroplasty [3]. Urethroplasty has emerged as an effective management option for almost all types of stricture and remains as the gold standard for long, complex and recurrent strictures [4-6].

Recurrence is still one factor that often arises after undergoing operative treatment. This study aims to describe and explore the most common causes of recurrence in patients with stricture seen from their comorbidities at the Department of Urology, Faculty of Medicine, University of Airlangga, Surabaya from 2013 - 2017.

Methods

This study used a case-control design with secondary data of all patients treated and undergoing operative management of the anterior-posterior urethral stricture in Dr. Soetomo Hospital from January 2013 to December 2017. The exclusion criteria were patients who diagnosed for the first time and had not yet operated, and patients who had undergone surgery and did not follow up.

Urethral stricture as the dependent variable and diabetes mellitus, hypertension, urine culture, and previous history of sachse were as independent variables. The data collection carried out by tracing the surgery book at Dr. Soetomo Hospital's GBPT and looking for the registration numbers of patients undergoing operative management of the anterior urethral stricture.

The case group was the patients with recurrence stricture and the control group without recurrence stricture. The data described by the distribution table and continued by Chi-square test with odd ratio analysis using the SPSS application. Significance value is significant if the value of $p < 0.05$. Ethics commission from Dr. Soetomo Hospital has approved this study (1026/KEPK/III/2019).

Results

Sample Characteristics

A total of 117 samples met the criteria of this study. Case group were 53 samples and control group were 64 samples. The mean age of the samples was 44.58 ± 18.08 years with the youngest age being 4 years and the oldest age was 80 years (Figure 1).

Most of the samples were male (94.9%) (Table 1). Previous sachse history was obtained in 41.9% of the sample. Only 13.7% of patients had diabetes mellitus and hypertension in 27.4% of the sample. Partial stricture is the dominant type of stricture that occurs in all samples.

The most commonly seen aetiology in this study was iatrogenic (31.6%) followed by infection (28.2%). The location of the stricture is at most not limited to one part of the anatomy (pan urethral stricture) with a percentage of 30.8% followed by the most stricture location of the pars membranous (27.4%). Positive urine culture occurs in 53% of the sample. LUTS symptoms and urinary retention occur in most samples.

Most of the therapy was given by panendoscopy-sachse (55.6%). The average length of the stricture was 1.43 ± 1.27 centimetres with the shortest stricture of 0.3 centimetres and the longest stricture of 7.4 centimetres (Figure 2). The recurrence rate in the sample that experienced recurrence was 6.98 ± 2.67 months (Figure 3).

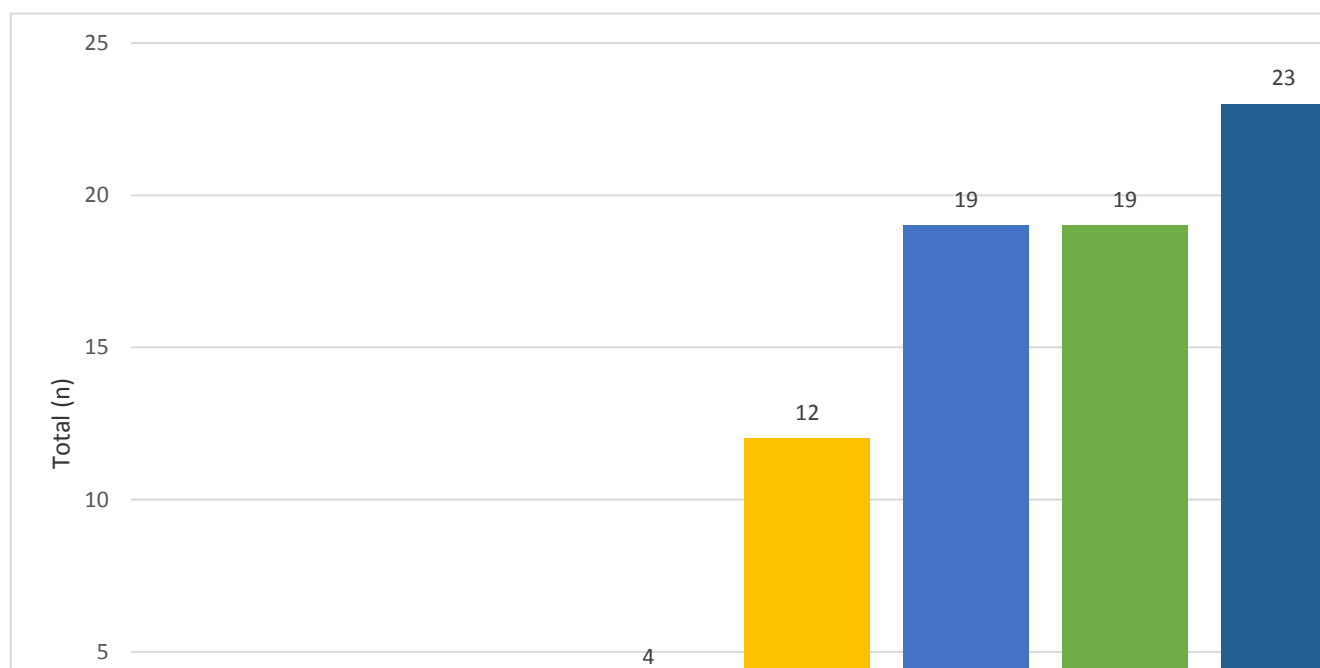


Figure 1: Age distribution of samples according to the classification of age from the Health Department, Ministry of Health, Indonesia

Table 1: Distribution of sample characteristics

Characteristics	N	Percentage (%)
Stricture recurrence		
Yes (case)	53	45.3
No (control)	64	54.7
Sex		
Male	111	94.9
Female	6	5.1
Comorbid		
Diabetes mellitus	16	13.7
Hypertension	32	27.4
Previous <i>sachse</i> history		
Sache history	49	41.9
Without <i>sache</i> history	68	28.1
Stricture type		
Total	43	36.8
Partial	74	63.2
Aetiology		
Infection	33	28.2
Trauma	17	14.5
Iatrogenic	37	31.6
Idiopathic	28	23.9
Congenital	2	1.7
Stricture location		
Pre prostatic	1	0.9
Prostatic	4	3.4
Membranous	22	18.8
Bulbous	40	34.2
Pendulous	13	11.1
Fossa navicularis	3	2.6
Pan urethral stricture	34	29.1
Urine culture		
Positive	62	53.0
Negative	55	47.0
LUTS symptom		
Yes	103	88.0
No	14	12.0
Urine retention symptom		
Yes	94	80.3
No	23	19.7
Treatment		
End to end anastomosis	25	21.4
Panendoscopy – <i>sachse</i>	65	55.6
Buccal mucosa graft	27	23.1

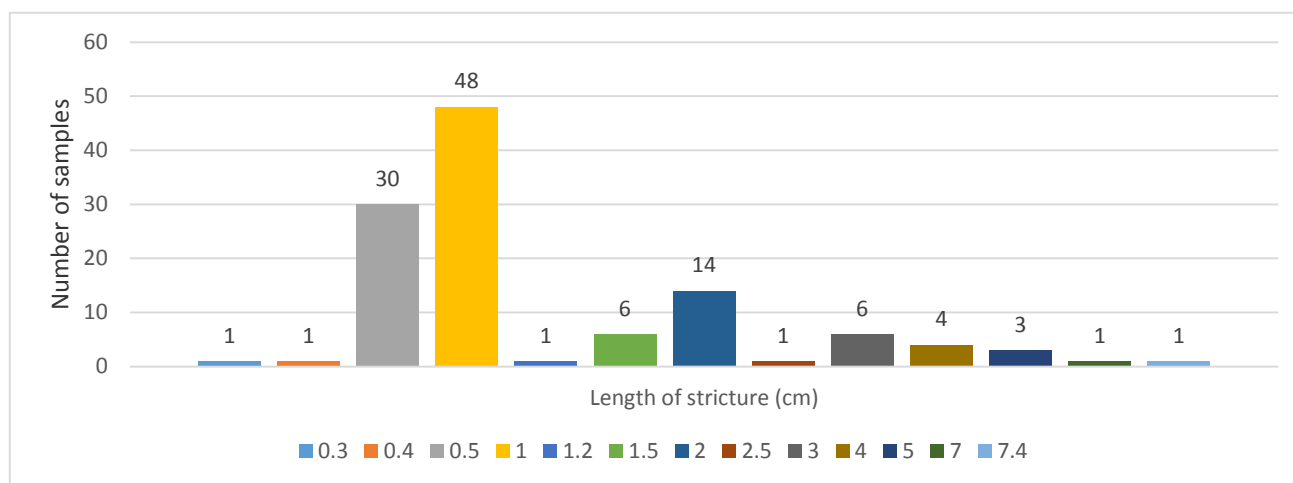


Figure 2: Distribution length of the stricture

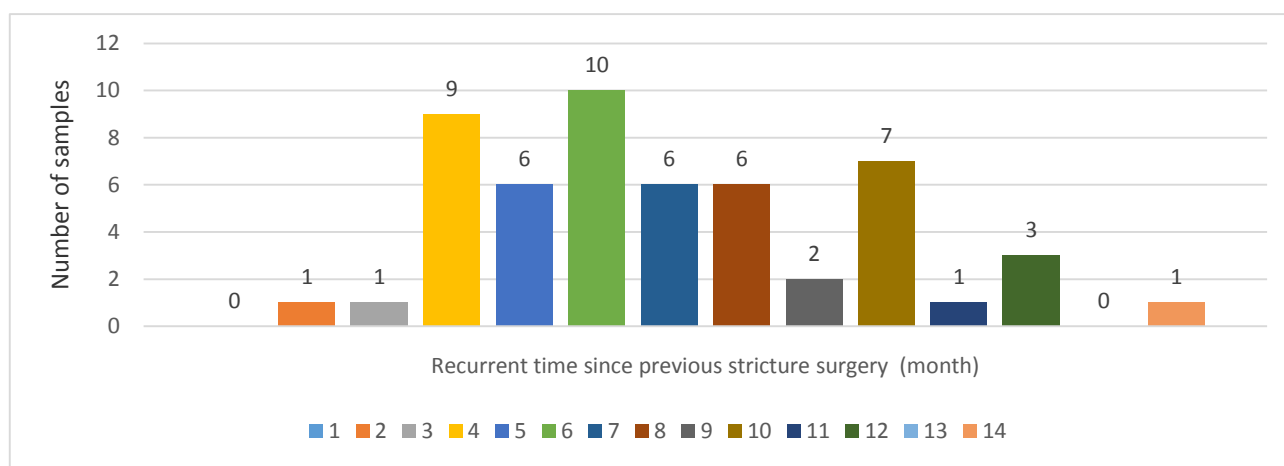


Figure 3: Distribution time of stricture recurrence in the case group

Bivariate Analysis

Both samples in case and control group, most did not have diabetes mellitus comorbidity (75.5% (n = 40); 86.3% (n = 101). There was a significant relationship between diabetes mellitus and recurrence of the urethral stricture (p = 0.002) with an OR value of 6.608 (95% CI 1.770 - 24.668). And also in both samples in the case and control group, most of them was without hypertension

(71.7% (n = 3873); 4% (n = 47)). In chi-square test showed no significant relationship between recurrent urethral stricture and hypertension (p = 0.834). Most of the samples in the case and control group were in positive urine culture (84.9% (n = 45); 73.4% (n = 47)). There was a significant relationship between urine culture and urethral stricture (p < 0.001) with OR, which was 15.551 (95% CI 6.108 - 39.592). There was a significant relationship in all case groups with a history of sachse surgery (p < 0.001) (Table 2).

Table 2: Bivariate analysis variables of diabetes mellitus, hypertension, urine culture, and previous sachse history with urethral stricture

Variables	Case	Control	OR	p-value
	N (%)	N (%)		
Diabetes mellitus				
Yes	13 (24.5)	3 (4.7)	6.608	0.002*
No	40 (75.5)	61 (95.3)		
Hypertension				
Yes	15 (28.3)	17 (26.6)	1.091	0.834
No	38 (71.7)	47 (73.4)		

Urine Culture				
Positive	45 (84.9)	17 (26.6)	15.551	0.001*
Negative	8 (15.1)	47 (73.4)		
Previous sachse history				
Sache history	49 (92.5)	0 (0)	-	0.001*
Without sachse history	4 (7.5)	64 (100)		

*p-value <0.05

Discussion

This study showed urethral stricture more frequently occurs in men than women. This can be influenced in terms of anatomy in which the male urethra is longer than the female urethra so that it allows for more frequent strictures [7, 8]. Age at most urethral stricture is in the age group 46-55 years followed by the age group 56- 65 years old. Previous studies stated that the risk of urethral stricture increased in the average age of 54 years [1].

The location of strictures in men is divided into two parts, namely anterior parts consisting of pars of bulbous, pars pendulous and fossa navicularis, posterior parts consisting of pars pre prostatic, pars prostatic and pars membranous. Pars bulbous stricture is the most common site for stricture followed by pars prostatica and pars membranous.

Previous studies have shown that the most common stricture site is pars bulbous and followed by pars pendulous, but in this study, pars pendulous is the fourth most frequent location. Cross-tabulation analysis of age categories with stricture locations, it was found that the most common location in pars bulbous tends to occur at a younger age which is in accordance with previous studies. In this study also showed that older age showed stricture at more than one anatomic location (pan urethral stricture) [9-11].

Patients with co-morbid diabetes mellitus, hypertension, coronary heart disease and chronic prostate inflammation can increase the risk of urethral stricture. Samples with diabetes mellitus and hypertension show different results in the recurrence of urethral stricture. The diabetes mellitus variable has a significant relationship to the occurrence of recurrent strictures with a six times higher risk for recurring strictures. This finding is consistent with what has been presented in previous studies that patients with

comorbidities of diabetes mellitus can increase the risk of urethral stricture [9, 10].

Hypertension variables showed no significant relationship. Iatrogenic is the dominant a etiology, followed by infection, idiopathic, trauma and congenital. Previous studies showed the most frequent aetiology of urethral stricture, iatrogenic, which reached 45.5% [12, 13]. Medical treatment such as sachse endoscopic therapy can increase the risk of stricture.

The recurrent urethral stricture was found to be significantly related to a history of previous stricture surgery with internal urethrotomy sachse. A total of 53% of the samples had positive urine culture and showed a significant relationship to the variable urethral stricture recurrence. Samples with positive urine culture also have a risk fifteen times greater than samples with a negative urine culture.

Previous studies have shown that strictures induced by infection, including lichen sclerosis, are reported as inflammatory strictures and cause one-third of all stricture cases to be followed by idiopathic and iatrogenic. Infections in stricture cases often occur along with other causes of infection [9-11]. The weakness of this study is that it did not examine possible variables that are confounding, such as a history of prostate TUR, medical actions in other fields of urology that can increase the risk of possible urethral stricture affected by other variables. This study did not use randomization in sampling so that it allowed selection bias.

Conclusion

There is a significant relationship between diabetes mellitus and positive urine culture on the recurrence of urethral stricture. There is also a significant relationship between recurrent urethral strictures with a previous history of sachse. However, there is no relationship between hypertension and recurrent urethral stricture.

References

1. Hampson LA, McAninch JW, Breyer BN (2014) Male urethral strictures and their management. *Nature Reviews Urology*, 11(1):43.
2. Andrich DE, Mundy AR (2008) What is the best technique for urethroplasty? *Eur. Urol.*, 54: 1031-41.
3. McDougal WS, Wein AJ, Kavoussi LR, Partin AW, Peters CA (2016) *Campbell-Walsh Urology eleven Edition Review : Urethral stricture disease*, 1128-1133.
4. Hohenfellner M, Santucci RA (2007) *Emergencies in Urology*. Verlag Berlin Heidelberg: Springer.
5. Koraitim MM (2012) Unsuccessful outcomes after posterior urethroplasty: definition, diagnosis, and treatment, *Urology*, 79: 1168.
6. Duarsa GWK, Pratama PKD, Sabudi IMNG, Oktavius D (2019) Graft procedure on urethroplasty, in comparison with flap procedure: A literature review. *Bali Medical Journal*, 8(3):592-595
7. Scanlon VC (2011) *Essentials of Anatomy and Physiology*. 6th ed. F.A. Davis Company.
8. Graham SD, Keane TE, Glenn JF (2016) editors. *Glenn's urologic surgery eighth edition*. Wolters Kluwer.
9. Emrullah Söğütülen, Hakan Bahadır Haberal, Fuad Guliyev, Bülent Akdoğan (2016) Urethral Stricture is an Unpleasant Complication after Prostate Surgery: A Critical Review of Current Literature. *Journal of Urological Surgery*, 1: 1-6.
10. Amjad Alwaal, Sarah D Blaschko, Jack W McAninch, Benjamin N Breyer (2014) Epidemiology of urethral strictures. *Transl. Androl. Urol.*, 3(2):209-213
11. Schlossberg SM (2006) A current overview of the treatment of urethral strictures: etiology, epidemiology, pathophysiology, classification, and principles of repair. In *Urethral Reconstructive Surgery*. Berlin: Springer, 59-65.
12. Brandes SB, Morey AF (2014) *Advanced male urethral and genital reconstructive surgery 2nd edition*. New York: Humana Press.
13. Lumen N, Hoebeke P, Willemsen P, De Troyer B, Pieters R, Oosterlinck W (2009) Etiology of urethral stricture disease in the 21st century. *The Journal of urology*, 1: 182(3):983-7.