

# Management of urethral strictures: A nationwide survey of urologists in the Kingdom of Saudi Arabia

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## Abstract

**Context:** urethral strictures commonly occur and considered difficult to manage due to high recurrence rate and wide variety of management approach.

**Aims:** This study aims to identify how urologists in Saudi Arabia manage new and recurrent urethral stricture cases and to investigate their opinions regarding urethroplasty.

**Settings and Design:** A cross-sectional study (Online Survey) among urologists.

**Subjects and Methods:** A nationwide survey of urologists registered with the Saudi Commission for Health Specialties was performed through a mailed questionnaire. A total of 603 urologists were selected from all five regions of Saudi Arabia, of whom 216 (35.8%) completed the questionnaire.

**Statistical Analysis Used:** SPSS software version 23 was used for data entry and analysis.

**Results:** Most urologists (40.3%) had treated 1–5 urethral strictures in the past year. The most common procedures used to manage urethral strictures were visual urethrotomy (82.4%), cystoscopy and dilatation (62.2%), and excision and primary anastomosis (20.8%). Minimally invasive procedures were used more frequently than any open urethroplasty techniques. Most urologists (63%) did not perform urethroplasty surgery, and 21.8% were not aware of any adult reconstructive urologists in Saudi Arabia. When used, however, the most commonly performed urethroplasty surgeries were excision and primary anastomosis, dorsal buccal graft augmented urethroplasty, and ventral buccal graft augmented urethroplasty.

**Conclusions:** Minimally invasive methods are easy to perform and have good short-term outcomes. As such, they are more commonly used for the management of urethral strictures. On the other hand, urethroplasty surgeries are challenging procedures that require greater experience and skill.

**Keywords:** Management pattern, urethra, urethral stricture

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## INTRODUCTION

Urethral strictures commonly occur, and their risk increases with age. They are also considered to be the most challenging and stressful problem that urologists

are required to manage.<sup>[1]</sup> Indeed, urethral strictures cause >1.5 million visits to urologists' offices annually in the US and were responsible for a financial burden of >\$191 million in the year 2000.<sup>[2]</sup>

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The approach to urethral stricture management has significantly changed over the past 40 years.<sup>[1]</sup> In particular, there has been a long-running debate between urologists regarding the roles of endourological procedures (i.e., internal urethrotomy or urethral dilatation) and urethroplasty.<sup>[3]</sup> Accordingly, many studies have been conducted worldwide to identify the most commonly performed procedures for urethral stricture management and to determine the importance of urethroplasty.

It has been found that for the management of both newly diagnosed and recurrent cases in the UK, urethrotomy is the most commonly used procedure, followed by dilatation then urethroplasty.<sup>[4]</sup> In the US, dilatation is the most common procedure, followed by urethrotomy, endourethral stent insertion, then urethroplasty. Furthermore, the most common urethroplasty procedure in the US is end-to-end anastomotic urethroplasty.<sup>[5]</sup> Overall, published data suggest that the minimally invasive methods of urethrotomy and dilatation are the most commonly used procedures in the management of urethral strictures worldwide.<sup>[6]</sup> However, despite being less common, urethroplasty has a much higher long-term success rate and better outcomes in terms of recurrence rate than dilatations and urethrotomies.<sup>[7,8]</sup> This thus suggests that for the definitive correction of urethral strictures, urethroplasty is the most effective method and should generally be considered the gold standard for treatment.<sup>[9,10]</sup>

In this study, we aimed to identify how urologists in Saudi Arabia manage patients with urethral stricture and to determine whether there is a discrepancy between government and private sector recommendations regarding management procedures and opinions toward urethroplasty.

**SUBJECTS AND METHODS**

A nationwide study was conducted among urologists (including registrars, senior registrars, and consultants) registered with the Saudi Commission for Health Specialties in all 5 regions of the Kingdom of Saudi Arabia. The survey was conducted from December 2016 to May 2017 as a mailed questionnaire. Along with the survey, each participant received information regarding the objectives of our study and a copy of the approval letter from the institutional review board.

The questionnaire consisted of 15 close-ended questions [Appendix 1] eliciting information on respondent demographics, the number of urethral strictures treated in the past year, commonly used procedures, urethral stricture management strategies, opinions toward urethroplasty, preferred minimally invasive methods of management,

and awareness of adult reconstructive surgery availability in Saudi Arabia.

SPSS software version 23 (SPSS Inc., Chicago, Illinois, USA) was used for data entry and analysis.

**RESULTS**

Of the 603 urologists contacted for our survey, 216 (35.8%) responded. The characteristics of these respondents are summarized in Table 1.

In terms of case numbers treated, we found that most urologists surveyed had treated 1–5 urethral strictures in the past year. The most common procedures used in descending order were visual urethrotomy, cystoscopy and dilatation, excision and primary anastomosis, and bougie à boule-blind dilatation. Minimally invasive methods were performed more commonly than any open urethroplasty techniques, with most urologists not performing any urethroplasty procedures. Of those who did, most performed 1–5 procedures, and only few performed more. The most commonly performed urethroplasty procedures in descending order were excision and primary anastomosis, dorsal buccal graft augmented urethroplasty, ventral buccal graft augmented urethroplasty, staged urethroplasty, and perineal urethrostomy. These results are summarized in detail in Table 2.

Regarding preferred management procedures for newly diagnosed patients with 1-cm urethral strictures, most urologists indicated that they would choose to treat the

**Table 1: Respondent characteristics**

|                                        | Number of respondents (%) |
|----------------------------------------|---------------------------|
| Region                                 |                           |
| Central                                | 87 (40.3)                 |
| East                                   | 34 (15.7)                 |
| North                                  | 27 (12.5)                 |
| South                                  | 25 (11.6)                 |
| West                                   | 43 (19.9)                 |
| Total                                  | 216 (100)                 |
| Main hospital practice                 |                           |
| Military/national guard/security force | 37 (17.1)                 |
| Ministry of health                     | 85 (39.4)                 |
| Private sector                         | 68 (31.5)                 |
| University hospital                    | 26 (12.0)                 |
| Total                                  | 216 (100)                 |
| Position                               |                           |
| Consultant                             | 89 (41.2)                 |
| Registrar                              | 68 (31.5)                 |
| Senior registrar                       | 59 (27.3)                 |
| Total                                  | 216 (100)                 |
| Years of practice including training   |                           |
| 5-10                                   | 51 (23.6)                 |
| 10-15                                  | 63 (29.2)                 |
| 16-20                                  | 41 (19.0)                 |
| >20                                    | 61 (28.2)                 |
| Total                                  | 216 (100)                 |

**Table 2: Number of urethral stricture patients encountered and stricture management procedures performed over the past year**

|                                              | Number of respondents (%) |
|----------------------------------------------|---------------------------|
| Number of patients encountered               |                           |
| None                                         | 20 (9.3)                  |
| 1-5                                          | 87 (40.3)                 |
| 6-10                                         | 54 (25.0)                 |
| 11-15                                        | 28 (13.0)                 |
| 16-20                                        | 8 (3.7)                   |
| >20                                          | 19 (8.8)                  |
| Total                                        | 216 (100)                 |
| Procedures performed                         |                           |
| Cystoscopy and dilatation                    | 130 (62.2)                |
| Bougie à boule blind dilatation              | 38 (17.6)                 |
| Visual urethrotomy                           | 178 (82.4)                |
| Laser urethrotomy                            | 23 (10.6)                 |
| Urethral stent placement (Memokath)          | 15 (6.9)                  |
| Excision and primary anastomosis             | 45 (20.8)                 |
| Ventral buccal graft augmented urethroplasty | 15 (6.9)                  |
| Dorsal buccal graft augmented urethroplasty  | 16 (7.4)                  |
| Lateral buccal graft augmented urethroplasty | 2 (0.9)                   |
| Staged urethroplasty                         | 10 (4.6)                  |
| Flap urethroplasty                           | 9 (4.2)                   |
| Perineal urethrostomy                        | 10 (4.6)                  |
| Skin graft urethroplasty                     | 1 (0.5)                   |
| Number of urethroplasties performed          |                           |
| None                                         | 136 (63.0)                |
| 1-5                                          | 62 (28.7)                 |
| 6-10                                         | 7 (3.2)                   |
| 11-15                                        | 3 (1.4)                   |
| 16-20                                        | 3 (1.4)                   |
| >20                                          | 5 (2.3)                   |
| Total                                        | 216 (100)                 |

patient with endourological management (i.e., internal urethrotomy or cystoscopy and dilatation) and half would opt for urethroplasty. For first recurrences in the same patient, 67.1% and 18.1% of urologists indicated that they would opt for endourological management and urethroplasty, respectively. For second recurrences in the same patient and beyond, however, the proportion of urologists opting for endourological management progressively fell, while the proportion of urologists opting for urethroplasty progressively rose. These results are summarized in detail in Table 3. Regarding preferred minimally invasive procedures, most urologists preferred to perform visual internal urethrotomy [Table 4].

Finally, with respect to opinions toward urethroplasty, we found that large proportions of surveyed urologists regarded it as having a high success rate and being a complex procedure. Furthermore, a substantial proportion was unaware of any adult reconstructive urologists in Saudi Arabia. These results are summarized in detail in Table 5.

## DISCUSSION

Over the past 40 years, the management of urethral strictures has undergone significant changes. Currently, minimally

invasive methods are the most commonly used,<sup>[1]</sup> which is in line with findings from our survey of urologists in Saudi Arabia. For example, we found that internal urethrotomy and dilatation were the most commonly performed procedures in the past year. These results are similar to those of nationwide surveys of urologists in the Netherlands, Italy, and Turkey,<sup>[11-13]</sup> as well as those of a survey demonstrating that dilatation and internal urethrotomy are the most commonly used procedures in the US. Regarding other procedures used for managing urethral strictures, we found that 6.9% of urologists surveyed had used urethral stents in the past year, which is also similar to the results of other studies.<sup>[11-13]</sup>

Although internal urethrotomy and dilatation differ procedurally, it has been suggested that they have similar recurrence rates.<sup>[14]</sup> Direct visual internal urethrotomy (DVIU), which was first described in 1974 by Sachse, has, in particular, become a widely popular and safe procedure that is frequently used for the primary management of urethral strictures.<sup>[15]</sup> However, studies examining recurrence rates of DVIU over a period of 4 years found that recurrence occurred in 61% of new DVIU cases, and in 100% of second and third DVIU cases.<sup>[16,17]</sup>

We conclude from these studies that internal urethrotomy is generally considered only as an initial management option for urethral strictures although it should be noted that these studies lack long-term follow-up data.

Regarding preferred procedures for the management of urethral strictures, most urologists (70.4%) preferred visual internal urethrotomy out of the minimally invasive methods available, where minimally invasive methods fail, open urethroplasty is generally considered throughout the literature as the best and most effective option for the definitive correction of urethral strictures. This is because it has a high success rate and better long-term outcomes than internal urethrotomy.<sup>[18,19]</sup> However, in accordance with another study,<sup>[5]</sup> we observed that the majority of urologists surveyed (63%) did not perform urethroplasty and that the most common invasive procedure was excision and primary anastomosis. A particularly interesting finding of our study was that 21.8% of urologists surveyed were unaware of there being adult reconstructive urologists available in Saudi Arabia. Furthermore, when presented with a multiple choice question regarding their opinion toward urethroplasty, large proportions of surveyed urologists indicated that they believed it has a high success rate (63%) and is a complex procedure (52%). These findings support our view that urethroplasty is a complex but effective procedure requiring urologists with sufficient skill and experience.

**Table 3: Preferred strategies for the management of urethral strictures**

|                                                                                      | Number of respondents (%) |
|--------------------------------------------------------------------------------------|---------------------------|
| Management of newly diagnosed urethral strictures                                    |                           |
| Clean intermittent catheterization                                                   | 3 (1.4)                   |
| Endourological management (i.e., internal urethrotomy or cystoscopy with dilatation) | 193 (89.4)                |
| Urethroplasty                                                                        | 11 (5.1)                  |
| Urethral calibration (bougie à boule)                                                | 9 (4.2)                   |
| Total                                                                                | 216 (100)                 |
| Management of first recurrences of urethral stricture in the same patient            |                           |
| Clean intermittent catheterization                                                   | 13 (6.0)                  |
| Endourological management (i.e., internal urethrotomy or cystoscopy with dilatation) | 145 (67.1)                |
| Urethroplasty                                                                        | 39 (18.1)                 |
| Urethral calibration (bougie à boule)                                                | 18 (8.3)                  |
| Urethral stent                                                                       | 1 (0.5)                   |
| Total                                                                                | 216 (100)                 |
| Management of second recurrences of urethral stricture in the same patient           |                           |
| Clean intermittent catheterization                                                   | 11 (5.1)                  |
| Endourological management (i.e., internal urethrotomy or cystoscopy with dilatation) | 85 (39.4)                 |
| Urethroplasty                                                                        | 105 (48.6)                |
| Urethral calibration (bougie à boule)                                                | 12 (5.6)                  |
| Urethral stent                                                                       | 3 (1.4)                   |
| Total                                                                                | 216 (100)                 |
| Management of third recurrences of urethral stricture in the same patient            |                           |
| Clean intermittent catheterization                                                   | 7 (3.2)                   |
| Endourological management (i.e., internal urethrotomy or cystoscopy with dilatation) | 44 (20.4)                 |
| Urethroplasty                                                                        | 153 (70.8)                |
| Urethral calibration (bougie à boule)                                                | 6 (2.8)                   |
| Urethral stent                                                                       | 6 (2.8)                   |
| Total                                                                                | 216 (100)                 |
| Management of chronically recurring urethral stricture in the same patient           |                           |
| Clean intermittent catheterization                                                   | 18 (8.3)                  |
| Endourological management (i.e., internal urethrotomy or cystoscopy with dilatation) | 19 (8.8)                  |
| Urethroplasty                                                                        | 156 (72.2)                |
| Urethral calibration (bougie à boule)                                                | 9 (4.2)                   |
| Urethral stent                                                                       | 14 (6.5)                  |
| Total                                                                                | 216 (100)                 |

**Table 4: Preferred minimally invasive methods for the management of urethral strictures**

| Method                                | Number of respondents (%) |
|---------------------------------------|---------------------------|
| Memokath stent                        | 5 (2.3)                   |
| Cystoscopy and dilatation             | 20 (9.3)                  |
| Visual internal urethrotomy           | 152 (70.4)                |
| Urethral calibration (bougie à boule) | 3 (1.4)                   |
| Clean intermittent catheterization    | 9 (4.2)                   |
| Laser urethrotomy                     | 27 (12.5)                 |
| Total                                 | 216 (100)                 |

**CONCLUSIONS**

Most urologists in Saudi Arabia manage urethral stricture patients with minimally invasive methods at first diagnosis and first recurrence. This is because minimally invasive

**Table 5: Opinions regarding urethroplasty and awareness of adult reconstructive urologists available in Saudi Arabia**

|                                                                                          | Number of respondents (%) |
|------------------------------------------------------------------------------------------|---------------------------|
| Opinions regarding urethroplasty                                                         |                           |
| It has a high success rate                                                               | 134 (62)                  |
| It is a complex procedure                                                                | 113 (52.3)                |
| It is associated with many complications                                                 | 35 (16.2)                 |
| It has a low success rate                                                                | 27 (12.5)                 |
| Reconstructive surgery is not available in Saudi Arabia                                  | 20 (9.3)                  |
| It is an easy procedure to perform                                                       | 6 (2.8)                   |
| Number of adult reconstructive urologists in Saudi Arabia that respondents were aware of |                           |
| None                                                                                     | 47 (21.8)                 |
| 1                                                                                        | 31 (14.4)                 |
| 2                                                                                        | 38 (17.6)                 |
| 3                                                                                        | 45 (20.8)                 |
| 4                                                                                        | 19 (8.8)                  |
| 5                                                                                        | 10 (4.6)                  |
| >5                                                                                       | 26 (12.0)                 |
| Total                                                                                    | 216 (100)                 |

methods are easy to perform and have good short-term outcomes. On the other hand, anastomotic urethroplasty and urethroplasty graft techniques are less frequently used, likely because urethroplasties are challenging procedures that require more experienced urologists. As such, some variation in standard practice across different hospitals and regions should be expected, with the availability of sufficiently experienced urologists in different centers playing a role in this variation. Finally, urology centers need to draw more attention to the availability of adult reconstructive surgery in Saudi Arabia.

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**Conflicts of interest**

There are no conflicts of interest.

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**Appendix 1: Management of urethral stricture questionnaire**

1. Regions of Saudi Arabia
  - North
  - South
  - East
  - West
  - Central
2. Main hospital practice
  - Private sector
  - Ministry of health
  - University hospitals
  - Military/National Guard/security force
3. Position
  - Registrar
  - Senior registrar
  - Consultant
4. Years of practice in urology including training
  - <5
  - 5-10
  - 10-15
  - 16-20
  - >20
5. Approximate number of urethral strictures that you have treated in the past year
  - None
  - 1-5
  - 6-10
  - 11-15
  - 16-20
  - >20
6. Procedures that have been done in the past year (check all that apply)
  - Cystoscopy and dilatation
  - Bougie à boule blind dilatation
  - Visual urethrotomy
  - Laser urethrotomy
  - Stent placement urology memokath
  - Excision and primary anastomosis
  - Buccal graft augmented urethroplasty:
  - Ventral
  - Dorsal
  - Lateral
  - Staged urethroplasty
  - Flap urethroplasty
  - Perineal urethrostomy
  - Skin graft urethroplasty
7. Approximate number of urethroplasties performed in the past year
  - None
  - 1-5
  - 6-10
  - 11-15
  - 16-20
  - >20
8. How do you manage newly diagnosed 1 cm bulbar urethral strictures?
  1. Urethral calibration (bougie à boule)
  2. Endourological management (internal urethrotomy or cystoscopy with dilatation)
  3. Urethral stent
  4. Clean intermittent catheterization
  5. Urethroplasty
9. In the same patient, how do you manage the first recurrence of urethral stricture?
  1. Urethral calibration (bougie à boule)
  2. Endourological management (internal urethrotomy or cystoscopy with dilatation).
  3. Urethral stent.
  4. Clean intermittent catheterization.
  5. Urethroplasty

**Appendix 1: Contd...**

10. In the same patient, how do you manage the second recurrence of urethral stricture?
  1. Urethral calibration (bougie à boule)
  2. Endourological management (internal urethrotomy or cystoscopy with dilatation)
  3. Urethral stent
  4. Clean intermittent catheterization
  5. Urethroplasty
11. In the same patient, how do you manage the third recurrence of urethral stricture?
  1. Urethral calibration (bougie à boule)
  2. Endourological management (internal urethrotomy or cystoscopy with dilatation)
  3. Urethral stent
  4. Clean intermittent catheterization
  5. Urethroplasty
12. How do you manage the chronic recurrence of urethral stricture?
  1. Urethral calibration (bougie à boule)
  2. Endourological management (internal urethrotomy or cystoscopy with dilatation)
  3. Urethral stent
  4. Clean intermittent catheterization
  5. Urethroplasty
13. What is your opinion regarding urethroplasty? (check all that apply)
  1. High success rate
  2. Complex procedure
  3. Many complications
  4. Low success rate
  5. Reconstructive surgery not available in KSA
  6. Easy procedure
14. How many adult reconstructive urologists available in Saudi Arabia you are aware of?
  - None
  - 1
  - 2
  - 3
  - 4
  - 5
  - >5
15. In managing urethral stricture by minimally invasive methods, which method is preferred by you?
  - Memokath
  - Cystoscopy and dilatation
  - Visual internal urethrotomy
  - Urethral calibration (bougie à boule)
  - Clean intermittent catheterization
  - Laser urethrotomy

*Contd...*