

# Perineal urethrostomy: A single-stage viable option for complex anterior urethral strictures

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## Abstract

**Introduction:** Perineal urethrostomy (PU) is a valid single stage option with maximum success to manage complex anterior urethral strictures. **Aims:** To evaluate the functional outcome of permanent PU using the Blandy technique in older patients or PU with staged reconstruction in young patients with severely diseased distal urethra. **Materials and Methods:** This is a retrospective analysis of 124 patients. They underwent Blandy's PU with or without Johanson stage 1. Exclusion criteria included patients with posterior urethral strictures or bladder neck contractures. **Results:** Mean age of patients was 54 years. Strictures due to catheterisation or instrumentation were most common – 85 (68.54%). Out of 124 patients, 71(57.3%) of them were posted for PU with Johanson stage 1 and 53 for PU only (42.7%) according to patients' choice. In patients age below 50 years, PU (N=10), PU with Johanson stage 1 (N=40) and Johanson stage 2 (N= 8) patients had mean Qmax of 20.2ml/s (17-24), 20.7ml/s (16-26), 16.375ml/s (14-18) respectively. In patients age > 50 years, PU (N=43), PU with Johanson stage 1 (N=31) and Johanson stage 2 (N= 4) patients had mean Qmax of 16.41ml/s (11-24), 17.25ml/s (11-25) and 14.75 ml/s (12-17) respectively. For patients with only PU, 8/53 patients (15.09%) required secondary intervention (stomal dilatation N=6 and TURP N=2) while in PU with Johanson stage 1 patients, 10/71(14.08%) required secondary intervention (Stomal dilatation N=6, 8.45% and TURP N= 4, 5.6%). 112/124 (90.32%) were considered successful. **Conclusion:** Since most of patients have suffered for years, PU provides results in one stage.

**Keywords:** Perineal urethrostomy, reconstructive urology, stricture urethra

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## INTRODUCTION

The surgical options for anterior urethral strictures are extremely diverse<sup>[1,2]</sup> and include endoscopic procedures to various urethroplasty techniques. The success rate of urethroplasty procedures is variable and the success rate is quoted up to 80% or higher.<sup>[3,4]</sup> Complex urethral strictures are not amenable to one stage urethral reconstruction.

Therefore, in such cases, perineal urethrostomy (PU) remains a single-stage surgery with a high success rate with the option of two-stage reconstruction in the younger age group, as PU is not acceptable to them because of the need to sit to urinate and inability to inseminate into the vagina. The role of PU has been revisited in complex strictures in the geriatric age group or those who desire one

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stage solution with maximum success. Here, we review the indications and outcomes of PU.

**Aims**

The aim of this study was to evaluate the functional outcome of permanent PU using the Blandy technique in older patients or PU with staged reconstruction in young patients with the severely diseased distal urethra.

**MATERIALS AND METHODS**

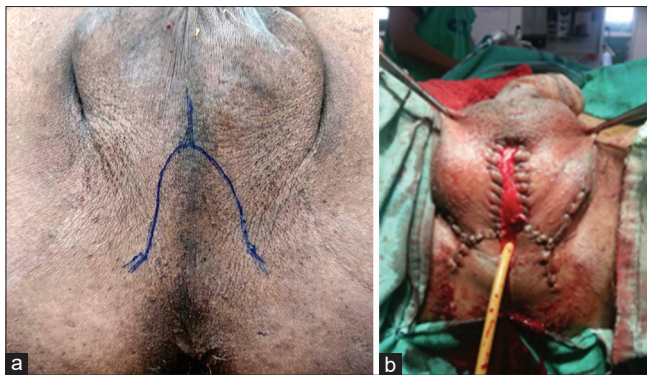
This is a retrospective analysis of 124 patients who underwent PU with or without Johanson Stage 1 and 2. Data extracted included patient demographics, stricture etiology, previous therapies, and the need for subsequent interventions. Exclusion criteria included patients with posterior urethral strictures or bladder neck contractures.

Suprapubic catheterization (SPC) was done in all patients. Routine hematological and biochemical investigations were done and patients were optimized preoperatively. A preoperative urine culture was done to assure sterile urine. Retrograde urethrogram and micturating cystourethrogram were done in all cases. Out of 71 Johanson Stage 1 patients, 27 are waiting for their Stage 2 and 32 patients have denied for the second-stage procedure. Their follow up was taken telephonically. Their postoperative  $Q_{max}$  was compared using SPSS 25 (by IBM Newyork, USA).

**Surgical technique**

After administrating pre-operative antibiotics, under spinal anesthesia, the patient was put in the lithotomy position. Antegrade and retrograde urethroscopy were done using a 6–7.5 French ureteroscope to characterize the stricture and evaluate the posterior urethra. We tried to negotiate 0.035” Terumo guidewire and was possible only in few cases.

Thereafter, the incision was marked as shown in Figure 1. Mobilization of inverted “U” shaped perineo-scrotal



**Figure 1:** (a) Incision marking for PU flap. (b) After Blandy’s perineal urethrostomy. PU: Perineal urethrostomy

flap was done with underlying full-thickness fat pad; the bulbospongiosus muscle was separated, exposing the distal bulbar urethra. Antegrade bougie was placed and bulbar urethra was opened for 5 cm. Stay sutures were placed, through urethrotomy, Cystoscope (19F) was passed retrograde to confirm veru and bladder neck.

In cases of the very bad urethral plate, a strip of the buccal mucosal graft (BMG) was put as midline inlay extending into the posterior urethra. A silicone Foley’s catheter (16 Fr) was placed through PU. The rest of the wound was closed in two layers. The catheter was kept for 7 days. Patients were followed at 6 weeks and 3 months for complaints, clinical examination, and uroflowmetry [Figure 1a and b].

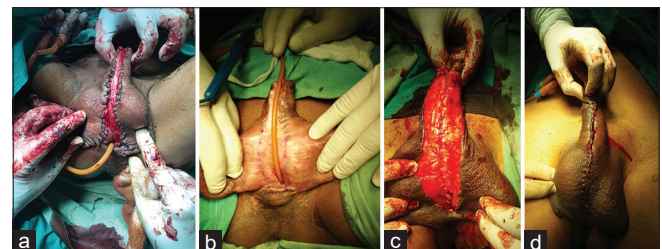
After 3–6 months of first stage patients, Stage 2 was done if stoma was adequate (21 F). In cases of the narrow urethral plate, single or double, BMG inlay was put. In cases of stomal stenosis, the graft was extended into the posterior urethra at 12 O’clock. The urethral plate to be tabularized was marked with two parallel incisions 25 mm apart, making it U shaped at the site of PU. The neourethral reconstruction was started proximally over 14 Fr silicone Foley’s catheter using 4-0 polyglactin subcuticular sutures restricting it distally up to corona. Tunica vaginalis flap was mobilized and the suture line was covered like a blanket wrap to minimize the risk of fistula formation. The third layer consisted of ventral dartos and finally, the skin was closed [Figure 2a-d].

**RESULTS**

1. Age of the patients: Mean age of the patients enrolled in our study was 54 years varying from 15 to 86 years

**Table 1: Number of patients in corresponding Age Groups**

Age of patients	Number of patients, n (%)
0-20	4 (3.2)
20-40	29 (23.4)
40-60	40 (32.2)
60-80	48 (38.7)
>80	3 (2.4)



**Figure 2:** (a) Postoperative appearance of Johanson Stage-1 PU. (b) Appearance of Johanson Stage-1 PU after 3-months. (c) Tubularisation of Johanson Stage-1 PU. (d) Postoperative appearance of Johanson Stage-2. PU: Perineal urethrostomy

of age. The age-wise distribution of these patients showed most patients (38.7%) were in the age group of 60–80 years [Table 1]

2. Presentation of patients: Seventy patients at presentation had acute urinary retention, 25 of them had associated acute kidney injury (AKI), 3 patients had a periurethral abscess, and the rest 54 patients had severe lower urinary tract symptoms (LUTS) as the major complaint
3. Indications for PU [Table 2] - In this study, the commonest etiological factor was prolonged catheterization even months or years ago
4. Types of procedure performed: Commonest procedure performed was PU with Johanson Stage 1  $n = 71$  (57.3%), followed by PU  $n = 53$  (42.7%). Out of 71 Johanson Stage 1 patients, 39 patients (54.9%) opted for Johanson Stage 2
5. Postoperative uroflow [Tables 3 and 4]
6. Success rate: PU was successful in 90.32% (112/124 patients) [Table 5]
7. Postoperative intervention: 18 of these 124 patients presented with voiding LUTS. Out of these, 12 patients had stomal stenoses responded to stomal dilatation, and the rest 6 required TURP through their PU to relieve LUTS. Three patients in Johanson Stage 2 had urethrocutaneous fistula (UCF). The secondary success rate was 95.2% (118/124) [Table 6].

**Table 2: Distribution of patients according to Etiology**

Etiology	n (%)
Prior catheterization	85 (68.54)
Prior failed urethroplasties	13 (10.5)
Idiopathic	12 (9.67)
BXO	10 (8.1)
Posthypospadias	4 (3.2)
	124 (100)

BXO: Balanitis xerotica obliterans

## DISCUSSION

Pan-anterior urethral strictures with lumen <5 Fr, balanitis xerotica obliterans (BXO), multiple failed urethroplasties, prior hypospadias repair, multiple obliterations, periurethral abscess, or urethra-cutaneous fistulae constitute complex urethral strictures. Such strictures are standard indications for two-stage reconstruction. Consequently, PU remains a successful and viable single-stage option in those with advancing age and little physical activity. PU virtually suits them as they are not the candidates for extensive surgery and do not mind voiding in a sitting position. In young patients not desirous of permanent PU, two-staged urethral reconstructions can be combined with it.

In our study, catheterization ( $n = 85$ , 68.54%) was the most common cause for stricture followed by redo urethroplasty ( $n = 13$ , 10.5%), followed by idiopathic causes ( $n = 12$ , 9.67%), previous urethroplasty BXO ( $n = 10$ , 8.1%) and posthypospadias repair ( $N = 4$ , 3.2%) respectively. In contrast, Lumen *et al.*<sup>[5]</sup> (total 102 patients) cited Iatrogenic 42 (41.17%), Urethrectomy 20(19.60%), Idiopathic 16(15.68%), Inflammatory 14(13.72%), Traumatic 10(9.8%) as indications of PU. Belsante<sup>[6]</sup> (total 56 patients) cited trauma or idiopathic in 26 (46%), lichen sclerosus in 20 (36%) and hypospadias in 10 (18%) as causative factors.

Prolonged catheterization (>4 weeks) was the most common etiological factor in this study. Patients with polytrauma, neurogenic bladder, coma, prolonged hospitalization, bedridden were such victims. Any male who needs catheterization for more than 1 week should be put on SPC and clean intermittent catheterization (CIC).

**Table 3: Comparison of mean uroflow(Qmax) between PU with Johanson Stage I, PU, and Johanson stage 2 patients among patients of age <50 and >50 years**

	Uroflowmetry		
	Q <sub>max</sub> (ml/s)	<50 (age years), n (%)	>50 (age years), n (%)
PU with Johanson Stage 1 (n=71)	19.20 (mean Q <sub>max</sub> )	(n=40)	(n=31)
	10-15	1 (2.5)	12 (38.7)
	15-20	20 (50)	11 (35.5)
	>20	19 (47.5)	8 (25.8)
PU (n=53)	17.13 (mean Q <sub>max</sub> )	(n=10)	(n=43)
	10-15	0	18 (41.86)
	15-20	5 (50)	18 (41.86)
	>20	5 (50)	7 (16.27)
Johanson Stage 2 (n=12)		<50 (n=8)	>50 (n=4)
	10-15	3 (37.5)	1 (25)
	15-20	3 (37.5)	3 (75)
	>20	2 (25)	0

PU: Perineal urethrostomy

Catheterization is one of the most common procedures needed in indoor patients and there is large economic and manpower expenditure on catheter-associated urinary tract infection (UTI). Further measures to prevent stricture and UTI include a short period of catheterization, the smallest catheter that serves the purpose, use of silicone catheter with aseptic precautions, and adequate lubrication.

Because of acute retention, marked frequency, high PVR, upper tract changes, AKI, we diverted urine by SPC in all the patients. This decreased infection rates, normalized upper tract, and opportunity to introduce bougie antegrade during surgery.

Out of 124 patients, 71 (57.3%) of these cases opted for staged Johanson Stage 1 and 53 for PU (42.7%). During follow-up (3-months), patients were assessed clinically and with uroflowmetry. Out of 71 Johanson Stage 1 with PU patients, 39 patients opted for Stage 2 reconstruction rest 32 patients refused for Stage 2 reconstruction due to their high satisfaction rates. Among these 39 patients, 27 patients are still waiting for Stage 2 reconstruction.

Overall, 31 (25%) patients had mean  $Q_{max}$  between 10–15 ml/s, 54 patients (43.5%) had mean  $Q_{max}$  between 15 and 20 ml/s and 39 patients (31.5%) had mean  $Q_{max} > 20$  ml/s.

**Table 4: Postoperative mean Qmax in each group according to age**

	Age (years)	Postoperative mean $Q_{max}$ (in ml/s)
PU	<50 (n=10)	20.2
	>50 (n=43)	16.41
PU with Johanson Stage 1	<50 (n=40)	20.7
	>50 (n=31)	17.25
Johanson Stage 2	<50 (n=8)	16.375
	>50 (n=4)	14.75

PU: Perineal urethrostomy

**Table 5: Number of interventions and success rate in each group**

	Number of patients	No postoperative intervention	Procedure	Success rate (%)
PU	53	50	3	94.3
PU with Johanson Stage 1	71	62	9	87.32
Johanson Stage 2	12	9	3	75

PU: Perineal urethrostomy

**Table 6: Type of intervention in each group**

Type of procedure	Intervention done, n (%)	No secondary intervention done, n (%)
PU (n=53)	8 Stomal dilatation, 6 (11.3) TURP, 2 (3.77)	45 (8.49)
PU and Johanson Stage 1 (n=71)	10 Stomal dilatation, 6 (8.45) TURP, 4 (5.6)	61 (8.59)
Johanson Stage 2 (n=12)	3 UCF, 3 (25)	9 (75)

PU: Perineal urethrostomy, TURP: Transurethral resection of the prostate, UCF: Urethrocutaneous fistula

On comparing mean  $Q_{max}$  in PU patients and PU with Johanson Stage 1 patient (17.13 ml/s and 19.20 ml/s respectively),  $P$  (0.157) was statistically not significant.

We arbitrarily divided the patients into two age groups to see the effect of coexisting BPH. In patients age below 50 years, PU ( $n = 10$ ), PU with Johanson Stage 1 ( $n = 40$ ) and Johanson Stage 2 ( $n = 8$ ) patients had mean  $Q_{max}$  of 20.2 ml/s (17–24), 20.7 ml/s (16–26), 16.375 ml/s (14–18) respectively. In patients age above 50 years, PU ( $n = 43$ ), PU and Johanson Stage 1 ( $n = 31$ ) and Johanson Stage 2 ( $n = 4$ ) patients had  $Q_{max}$  of 16.41 ml/s (11–24), 17.25 ml/s (11–25) and 14.75 ml/s (12–17) respectively. On statistical analysis, mean  $Q_{max}$  amount subgroups below and above 50 years were not significant ( $P > 0.05$ ).

For the entire cohort, patients 112 (90.32%) were considered successful (no need for further intervention). In Johanson Stage 1 group, 62 (87.3%) patients were successful versus (87.5%) patients in PU cases 50 (94.3%).

Twelve of these 124 patients required subsequent intervention mostly due to their stomal stenosis. Postoperative stenosis occurred in 12 (9.6%) patients. These 12 patients required PU dilatation in their follow-up due to stomal stenosis and were kept on CIC. The secondary success rate was 95.2% (118/124) defined as patients not requiring further interventions.

Six of these patients (4.8%) had LUTS without stomal stenosis. They underwent TURP due to failure of medical therapy. These patients were not considered in complications of PU the perceived disadvantages of this procedure included disfigurement due to Johanson Stage 1, need to sit to urinate, and inability to inseminate into the vagina.

In patients who underwent Johanson Stage 2, 3 out of 12 developed UCF and were cured after secondary closure.

Six patients in this study without stomal stenosis underwent TURP for severe obstructive LUTS or retention of urine not manageable with medical treatment. Hence, this was not considered a complication of PU.

It's important to recognize a patient's expectations. The single-stage procedure restores the ability to void in a standing position without discomforts associated with PU.<sup>[7]</sup> However, one stage reconstruction is doomed to fail in complex strictures. Therefore, PU is a viable single-stage option in such cases with the highest success despite some disadvantages and should be discussed as a successful treatment modality with very good functional outcomes. The patients in these age groups are already used to voiding in the sitting position; thus, they accept this diversion more readily.<sup>[8]</sup>

## CONCLUSION

Even in expert hands, complex anterior urethral strictures have a very low success rate in single-stage procedures. Pan urethral strictures with multiple obliterations, BXO with <5 Fr Lumen, failed hypospadias repair,<sup>[9]</sup> and previously failed urethroplasties are indications for the staged procedure.

PU is the most valid single-stage option in cases of complex anterior urethral strictures. Unfortunately, PU was performed after many unsuccessful urethroplasties by many surgeons when it should have been one of the most suitable first options. Such patients lamented why this option was not offered to them earlier.<sup>[10]</sup> So, the role of PU has been revisited for these reasons. This is further evident by the fact

that 32 out of 71 patients with PU and Johanson Stage 1 were so much satisfied with their results that they did not opt for the second-stage despite disfiguring Johanson Stage 1.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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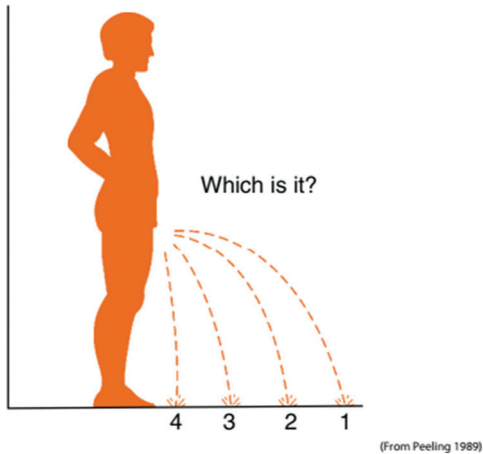
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## QUALITY QUESTIONNAIRE <sup>[10]</sup>

Patient-related outcomes measure (PROM) questionnaire was used to assess the postoperative results in our study

1. Is there a delay before you start to urinate?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Most of the time
  - e. All of the time
2. Would you say that the strength of your urinary stream is
  - a. Normal
  - b. Occasionally reduced
  - c. Sometimes reduced
  - d. Reduced most of the time
  - e. Reduced all of the time
3. Do you have to strain to continue urinating?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Most of the time
  - e. All of the time
4. Do you stop and start more than once while you urinate?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Most of the time
  - e. All of the time
5. How often do you feel your bladder has not emptied properly after you have urinated?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Most of the time
  - e. All of the time
6. How often have you had a slight wetting of your pants a few minutes after you had finished urinating and had dressed yourself?
  - a. Never
  - b. Occasionally
  - c. Sometimes
  - d. Most of the time
  - e. All of the time
7. Overall, how much do your urinary symptoms interfere with your life?
  - a. Not at all
  - b. A little
  - c. Somewhat
  - d. A lot

8. Please ring the number that corresponds with the strength of your urinary stream over the past month. Which is it?  
4 3 2 1



9. Are you satisfied with the outcome of your operation?
- Yes, very satisfied
  - Yes, satisfied
  - No, unsatisfied
  - No, very unsatisfied
10. If you were unsatisfied or very unsatisfied is that because:
- The urinary condition did not improve
  - The urinary condition improved but there was some other problem
  - The urinary condition did not improve and there was some other problem as well
- By placing a tick in one box in each group below, please indicate which statements best describe your own health state today.

#### Mobility

- I have no problems in walking about
- I have some problems in walking about
- I am confined to bed

#### Self-care

- I have no problems with self-care
- I have some problems washing or dressing myself
- I am unable to wash or dress myself

#### Usual activities (e.g., work, study, housework, family or leisure activities)

- I have no problems with performing my usual activities
- I have some problems with performing my usual activities
- I am unable to perform my usual activities

#### Pain/discomfort

- I have no pain or discomfort
- I have moderate pain or discomfort
- I have extreme pain or discomfort

#### Anxiety/depression

- I am not anxious or depressed
- I am moderately anxious or depressed
- I am extremely anxious or depressed

To help people say how good or bad a health state is, we have drawn a scale (rather like a thermometer) on which the best state you can imagine is marked 100 and the worst state you can imagine is marked 0. We would like you to indicate on this scale how good or bad your own health is today, in your opinion. Please do this by drawing a line from the box below to whichever point on the scale indicates how good or bad your health state is today.

