

# DIRECT VISION INTERNAL URETHROTOMY (DVIU) AND REGULAR CLEAN SELF INTERMITTENT CATHETERIZATION(CSIC) FOR SHORT BULBAR URETHRAL STRICTURES: A DURABLE SOLUTION

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## Abstract

**Background:** To evaluate durability of DVIU results and recurrence of stricture if the CSIC was done regularly up to one year and weekly thereafter.

**Methods:** This retrospective study was conducted in the Department of Urology at tertiary care teaching hospital of Avicenna medical college Lahore Pakistan. Files of all patients operated between January 2017 and July 2021 for single bulbar urethral strictures of less than 1-1.5cm size in length, iatrogenic, idiopathic, traumatic or inflammatory origins were evaluated. Patient with multiple or complicated strictures of post urethroplasty, post hypospadias repair, previous radiation or multiple DVIU were excluded from the study. Data analysis of all patients who were on CSIC following direct vision internal urethrotomy were evaluated at 3,6,12 and 24 months.

**Results:** Mean age of patients was 41.13 years with range between 26-74 years. Most Common cause of urethral strictures were idiopathic 66(58.92%) followed by iatrogenic 27(24.11%) causes. After 24 months of follow up 95 (84.82%) patients maintained urethral caliber up to 16 Fr. Failure or recurrence was found in 17 (15.18%) patients who required intervention.

**Conclusion:** Direct vision internal urethrotomy (DVIU) with regular clean intermittent self-catheterization (CSIC) was found to have a good success rate in bulbourethral strictures up to 1 cm in selected patients.

**Keywords:** Clean Self-Intermittent Catheterization, Direct Vision Internal Urethrotomy, Recurrence, Urethral Strictures,

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Anterior urethral stricture refers to scarring of corpus spongiosum which results in narrowing of urethral lumen. Urethral strictures are encountered in routine practice of urologist.<sup>1</sup> Common etiological factors for this are trauma, infection, inflammatory processes, iatrogenic urethral manipulations and idiopathic. Straddle injury, penetrating injury, gonococcal

urethritis, lichen sclerosis, prostatic surgeries, urethral catheterization and instrumentation, previous hypospadias surgery are well known causes of urethral strictures.<sup>2</sup> Patients usually present with voiding symptoms, dysuria, recurrent urinary tract infections (UTI). Severe cases may present with urinary retention, bladder stones or obstructive nephropathy.<sup>3</sup> Treatment option includes urethral dilation, direct vision internal urethrotomy(DVIU) or open urethroplasty procedures. DVIU and dilatation are most commonly performed minimal invasive procedure for urethral strictures because of its advantages of simplicity, low cost, minimal complications, short hospitalization and recovery time. Dilatation has high recurrence rates whereas urethroplasty surgery is complex, demanding good

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surgical skills, high cost and with long recovery time.<sup>4</sup> Recurrence is the most common complication of DVIU. Despite the initial good results in initial studies, recent studies show poor long-term success of DVIU. The concept of clean self-intermittent catheterization (CSIC) after DVIU was introduced into 1980's.<sup>5</sup> Lawrence and McDonagh have concluded that low friction self-catheterization after DVIU is very satisfactory method of managing patients with recurrent strictures.<sup>6,7</sup> Kjaegarrd et al have studied 55 patients and concludes that weekly CSIC is a simple method of reducing recurrence of strictures after DVIU.<sup>8</sup> Various studies have conducted worldwide having different conclusions. This study was planned to evaluate durability of DVIU results and recurrence of stricture if the CSIC was done regularly upto one year and weekly thereafter. Well informed patients who remained in follow up after internal urethrotomy for CSIC had a better outcome in terms of recurrence of stricture. They did not require internal urethrotomy again and remained symptom free till they kept them in follow up for CSIC.

## METHODS

This retrospective study was conducted at tertiary care teaching hospital of Avicenna medical college Lahore Pakistan. Files of all patients operated for bulbar urethral strictures between January 2017 to July 2021 were evaluated. As per study protocol only single bulbar stricture less than 1-1.5cm size in length, iatrogenic, idiopathic, traumatic or inflammatory origins were included. Urethroplasty surgery was offered to the indicated patients. Those who refused were taken into the study. Patient with multiple or complicated strictures of post urethroplasty, post hypospadias repair, previous radiation or multiple DVIU were excluded from the study. Before contemplating procedure, patients were thoroughly explained about nature of disease and its recurrence potential. They were counseled about regular passage of clean self-intermittent cauterization (CSIC) for at least 2 years or life time if required. They were motivated to make it part of daily routine like brushing teeth, cleaning body parts to avoid recurrence of disease. After initial evaluation of stricture with retrograde urethrogram, a standard technique of Direct Vision Internal Urethrotomy (DVIU) using cold knife with 21 Fr Urethrotome sheath was used. A single 12 o'clock incision was given to divide the

full thickness of scar tissue until Urethrotome sheath goes freely into bladder.<sup>20</sup> Fr Foley catheter passed over guide wire. Patients were usually discharged on next day and catheter was kept for 7 to 10 days. After catheter removal patients were instructed to do CSIC with 18 Fr nelaton tube daily for 3 months then alternate day for next 3 months and then twice a week there after up to one year. After one year of regular CSIC they were asked to do it weekly. All patients were first followed after 3 weeks, then 3 monthly up to 1 year and 6 monthly thereafter. On follow up symptoms related to flow, any difficulty in CSIC and urinary tract infection were asked. All patients were followed upto 24 months. During follow-up if patients complained of being unable to pass 18 Fr nelaton tube but happy with urinary stream then they were switched to 16Fr nelaton tube. If unable to pass 16 Fr nelaton tube then DVIU was considered failure and retrograde urethrogram (RGU) was advised and further definitive treatment was planned. The obtained data were expressed in number and percentage.

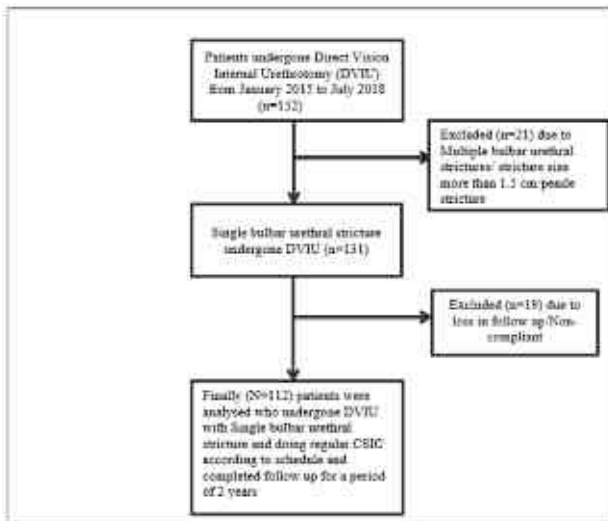
## RESULTS

From January 2017 to July 2021 total 152 patients underwent DVIU. 131 patients having single bulbar urethral stricture were included in study and 19 patients lost follow up. Finally, we analyzed the data of 112 patients who had completed 24 months of follow up. [Figure 1] Mean age of patients was 41.13 years with range in between 26-74 years. Causes of stricture were idiopathic in 66 (58.92%), inflammatory in 15 (13.39%), iatrogenic (post catheterization, post TURP, previous dilatation) in 27(24.11%) and traumatic in 04 (3.57%) patients. Location of stricture was proximal bulbar in 18 (16.07%), midbulbar in 58 (51.79%) and distal bulbar in 36(32.14%) patients. In 99(88.39%) patients' stricture was <1cm in length and in 13(11.61%) patients, it was between 1-1.5cm.

All 112 patients were first kept on 18 Fr CSIC. 71 switched over to 16 Fr within 3 months due to difficulty in CSIC with 18 Fr. Overall, at the end of 12 months, 37 were doing CSIC using 18Fr, 67 with 16 Fr and 8 required interventions. After 24 months 95 (84.82%) patients-maintained calibers above 16 Fr catheter and 17(15.18%) required intervention. [Table 2] Out of these 17 patients, 9 were having stricture length >1-1.5cm, 3 was of traumatic origin, 4 iatrogenic, 4 inflammatory and 6 were of idiopathic etiology. During the period of 2 years, 19 developed urinary tract infection and 3 had epididymo-orchitis requiring intravenous antibiotics. (Table 3)

**Table 1:** Baseline characteristics of all the patients (n=112)

Characteristic	Number (%)
Mean age (years)	41.13 (range 26-74)
<b>Etiology</b>	
Idiopathic	66 (58.92%)
Inflammatory	15(13.39%)
Traumatic	04 (3.57%)
Iatrogenic	27(24.11%)
<b>Stricture size</b>	
< 1 cm (short bulbar)	99 (88.39%)
1 to 1.5cm	13(11.61%)
<b>Site of stricture</b>	
Proximal bulbar	18(16.07%)
Mid bulbar	58 (51.79%)
Distal bulbar	36 (32.14%)



**Figure 1:** Study Flowchart

**DISCUSSION**

Internal urethrotomy is transurethral procedure of incision through scar tissue to healthy tissue in corpus spongiosum.

DVIU was initially used by Sachse in 1974, is still the most commonly performed procedure for

**Table 3:** Causes of failure/recurrence in patients

Etiology	Number of patients (%)
Idiopathic (n=66)	06 (9.09%)
Inflammatory (n=15)	04 (26.67%)
Traumatic (n=4)	03 (75%)
Iatrogenic (n=27)	04(14.81%)
Stricture >1cm (n=13)	09 (69.23%)

stricture urethra.<sup>6</sup> Lawrence and McDonagh have reported that all 42 patients included in their study; on low friction self-catheterization after DVIU were able to pass catheter satisfactorily and maintained flow rates. Roosen concluded CSIC is promising preventive measure for stricture recurrence as 19 patients out of 29 in their study regularly done CSIC and had maintained significantly improved flow rates.<sup>9</sup> Studies done by Kjaegarrd et al and Lauritzen et al have also found that CSIC group developed significantly less recurrence as compared to non- CSIC (control) group after follow up.<sup>8,10</sup> In present study 84.82% patients were able to maintained flow more than 15ml/sec after clean self-intermittent catheterization (CSIC) using 16Fr catheter. Recurrence of strictures Present study were found in 15.18% patients. These patients required intervention in the form of either urethroplasty or repeat DVIU. One study has reported that simple urethral dilation for recurrent bulbo membranous urethral strictures has significantly less recurrence rate.<sup>11</sup> Systemic review and Meta-analysis done in 2014 and 2016 respectively have reported that intermittent self-dilatation may confer reduced risk of recurrence of urethral stricture recurrence.<sup>12,13</sup> Urethral stricture size more than 1cm in length out of all recurrence patients was found in 52.94% patients in present study. Similar results were in many studies in which they have found more recurrence in patients having stricture size more than 1 cm.<sup>4,5,7</sup> This proves that large stricture length is responsible for more recurrence rate. Pansadoro et al found

**Table 2:** Attrition on clean self-intermittent catheterization(CSIC) and failures (n=112)

	Just after treatment	After 3 months	After 6 months	After 12 months	After 24 months	
18 Fr catheter	112	41	39	37	36	95 (84.82%)
16 Fr catheter	0	71	69	67	59	
Failure/recurrence (Not maintained on 16 Fr catheter)	0	0	04	08	17	17 (15.18%)

recurrence rate 84% for penile strictures.<sup>14</sup> In present study 15.16% recurrence rate may also be due to the fact that the present study included only patients of bulbar urethral strictures which shows good success rate because of well vascularized part. In our study 75% patients of traumatic origin were found to have recurrence as compared to other causes. Nielsen et al found patients of inflammatory and traumatic strictures have less recurrence than iatrogenic and infective etiology.<sup>15</sup> There is no consensus about cause of recurrence and etiology as different studies have different conclusions about etiology and its role in recurrence. In the present study, old age patient's acceptance and compliance were found better and they had good perception about quality of life with weekly CSIC. Greenwell et al in 2004 suggested the strategy of dilation/ initial urethrotomy followed by urethroplasty in recurrent stricture is most cost effective.<sup>16</sup>

## CONCLUSIONS

The present study concluded that good direct vision internal urethrotomy (DVIU) followed by regular clean intermittent self-catheterization (CSIC) is durable and cost effective method compliant for selected patients.

### Conflict of Interest

*None*

### Funding Source

*None*

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**The aim of medicine is to prevent disease and prolong life; the ideal of medicine is to eliminate the need of a physician.”**

—William J. Mayo