

Yürük <i>et al.</i> [67]	193	65 (SD: 13)	36 (SD: 12)	Bulbar: 100%	< 1 cm: 140 (73%)	0%	87% of recurrence ≤ 3	77%
					1-2 cm: 21 (11%)		100% of recurrence ≤ 6	-
					2-3 cm: 32 (17%)			

DVIU = Direct vision internal urethrotomy; IQR = interquartile range; N = number of patients; NR = not reported
SD = standard deviation; TTR = time to recurrence.

6.2.1.1.2 Direct vision internal urethrotomy for recurrent strictures and as salvage treatment after failed urethroplasty

In the OPEN trial, a recurrent stricture was defined as at least one previous failed intervention (endoscopic urethrotomy, urethral dilatation, urethroplasty) [205]. The previous intervention was predominantly DVIU. Despite poor recruitment, 108 and 112 patients were randomised to urethroplasty and DVIU respectively in a 24-month study protocol. Both groups had a similar improvement in voiding score symptoms after intervention. However, patients undergoing urethroplasty had 2.6 higher odds of experiencing an improvement of > 10 ml/s in their maximum urinary flow compared to those undergoing urethrotomy (p=0.001) [205]. Need for re-intervention was observed in 13.8% vs. 25.9% of cases respectively allocated to urethroplasty and DVIU resulting in a 48% lower risk for re-intervention with urethroplasty (HR: 0.52; 95% CI: 0.31-0.89; p=0.017) [205]. Of note, self-dilatation was not considered a re-intervention [205]. Despite more re-interventions in the DVIU group, both treatments resulted in a similar improvement in quality of life but with a higher cost for urethroplasty with the limitation that the follow-up is only two years. [206]. Direct vision internal urethrotomy is also used as salvage treatment for recurrent strictures after urethroplasty. Brown *et al.*, used DVIU for stricture recurrence (mean length: 4 cm; range: 1.5-7 cm) after excision and primary anastomosis (EPA), buccal mucosa grafts (BMG) urethroplasty and penile skin graft urethroplasty [207]. Patency was obtained in thirteen out of 37 cases (35%) after a single DVIU. After free graft urethroplasty (FGU), a short, veil-like stricture (or "diaphragm") might develop at the distal or proximal end of the graft. Rosenbaum *et al.*, used DVIU to a selected cohort of 43 patients with a short (< 1 cm), veil-like stricture after BMG urethroplasty [208]. After a mean follow-up of twelve months, patency rate was 51%.

6.2.1.1.3 Predictors of failure of "cold knife" direct vision internal urethrotomy

Several groups tried to identify prognostic factors to predict which patients are most likely to fail initial treatment (Table 6.2).

In the absence of well-designed, adequately powered multi-centre trials it is difficult to answer the question as to which clinical factors are predictive of failure of DVIU in men with urethral strictures. However, based on the predictors evaluated above, one can summarise that the best candidates are previously untreated patients with a single, short (max. 2 cm) bulbar stricture. Barbagli *et al.*, reported a five-year patency rate of 71% for patients with untreated short (1-2 cm) bulbar urethral strictures [199].

Table 6.2: Predictors for urethral patency after direct vision internal urethrotomy

Author	Location	Length	Calibre	Multiplicity	Prior DVIU
Steenkamp <i>et al.</i> [196] / Heyns [209]	RR for recurrence penile vs. bulbar: 1.85 (95% CI: 0.94 to 3.67, p = 0.077)	< 2 cm: 60% (@12 months)	NR	NR	None: 50-60% (@48 months)
	-	2-4 cm: 50% (@12m)	-	-	1: 0-40% (@48 months)
	-	> 4 cm: 20% (@12 months)	-	-	2: 0% (@24 months)
Al Taweel <i>et al.</i> [200]	Bulbar: 11%	< 1 cm: 27%	NR	NR	0: 12.1%
	Penile: 0%	1-2 cm: 0%	-	-	1: 7.9%
	Penobulbar: 0%	> 2 cm: 0%	-	-	> 1: 0%