

# Urethral Catheter vs Suprapubic Catheter: Which drains more completely and why?

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## BACKGROUND

Reconstructive urologists, often place both a urethral catheter (UC) and suprapubic (SP) catheter intraoperatively to prevent extravasation of undrained urine across anastomosis sutures after various urethroplasty surgeries.

Postoperatively, many surgeons leave one catheter to gravity drainage and cap the other.

No consensus exists on which catheter drains the bladder more completely.

## OBJECTIVE

We sought to identify differences in urine outflow and if both catheters (UC and SP catheter) should be opened to maximize bladder drainage.

## METHODS

Urine output (UOP) records from patients who underwent Stage II Phalloplasty with urethral lengthening from 5/2017 to 11/2020 were retrospectively reviewed.

Both a UC and SP catheter were placed to gravity drainage postoperatively.

UOP (mL) from each catheter was recorded separately, twice daily, through discharge.

Mixed model regression modeling tested for differences in UOP by catheter French (Fr) and time.

## RESULTS

### Population Characteristics

- 18 post-operative phalloplasty patients identified
- 78% of patients had 16Fr UC and SP catheters
- Median Length of Stay: 5 days (Range 1.5 – 7.0)
- No morbidly obese patients
- All patients ambulated on post-op day 3
- 331 total 12-hour UOP shifts recorded (UC + SP catheter)

Table 1.

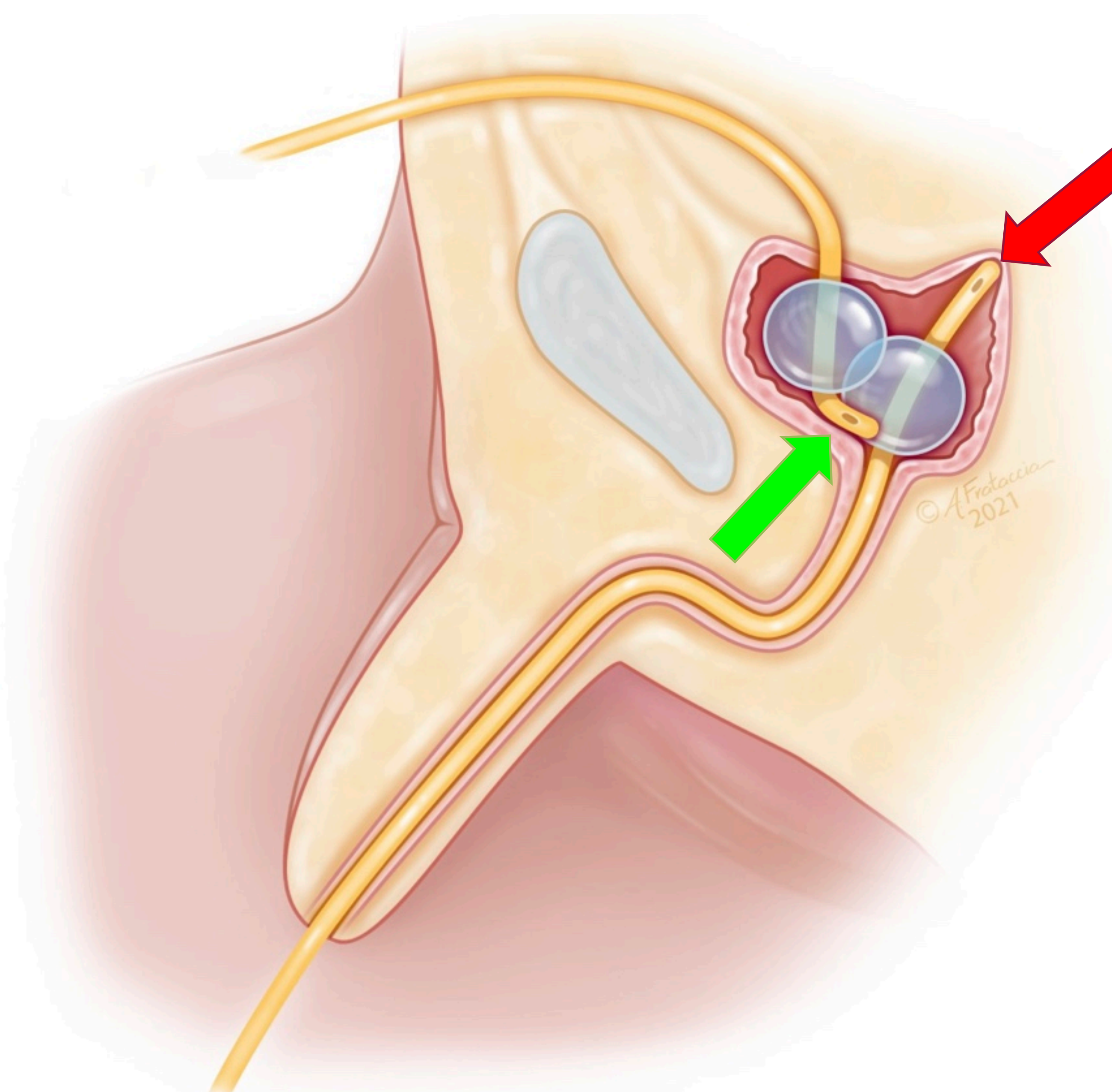
Simultaneous Drainage Pattern from Both Indwelling Urethral and Suprapubic Catheters

	Urethral Catheter n = 165	Suprapubic Catheter n = 166	p-value	Estimated Difference (95% CI)
<b>Urine Output</b>				
-Mean Catheter Output (per 12-hour shift)	651 ml	968 ml	$p = 0.004$	308 ml (116, 501)
-Daytime Output (7AM to 7PM)	718 ml	1051 ml	$p = 0.014$	322 ml (75, 570)
-Nighttime Output (7PM to 7AM)	586 ml	886 ml	$p = 0.021$	295 ml (51, 539)
<b>Urine Output Controlling for Catheter Fr</b>				
-Mean Catheter Output (per 12-hour shift)	651 ml	968 ml	$p = 0.001$	345 ml (174, 517)

Figure 1:

Anatomic Illustration of Postoperative Dual Bladder Drainage using Urethral and Suprapubic Catheters in Transgender Men Undergoing Stage II Phalloplasty

- Sagittal section view of the decompressed urinary bladder containing both an indwelling urethral catheter and suprapubic catheter.
- The **urethral catheter inlet** abuts the bladder dome while the suprapubic catheter inlet resides inferiorly at the bladder neck.
- The more gravity-dependent location of the **suprapubic catheter inlet** likely optimizes bladder drainage.



## CONCLUSIONS

Simultaneous bladder drainage by both a UC and SP catheter is associated with significantly greater drainage from the SP catheter (59.7% vs 40.3%,  $p=0.004$ ).

The difference in urinary drainage is likely explained by the SP catheter tip and drainage inlet residing in a more gravity-dependent location, within the funnel-shaped bladder neck.

These findings suggest that when using two catheters, both should be placed to gravity drainage.

For drainage with a single catheter, SP catheters will likely drain the bladder more completely than UCs.

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