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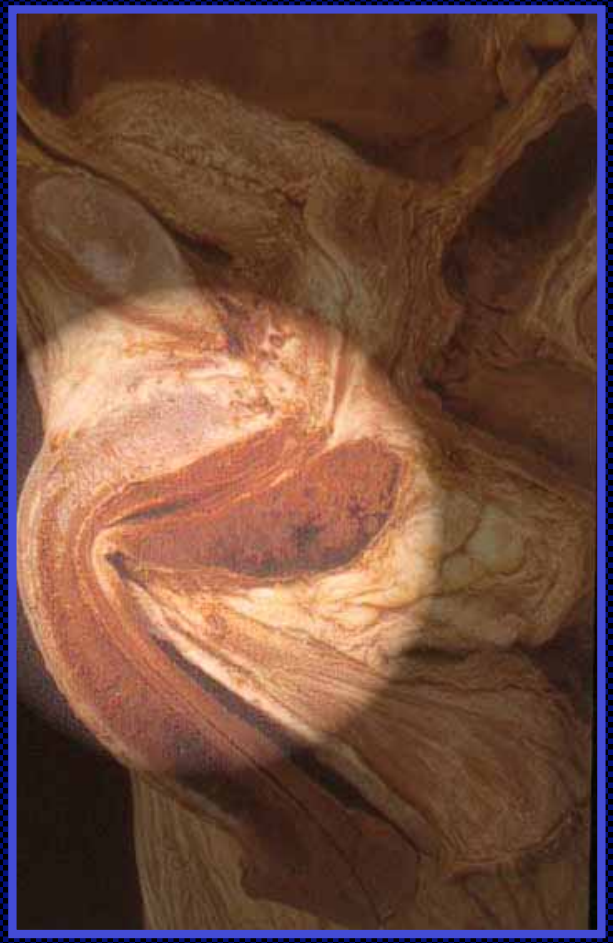
Anastomotic urethroplasty - principles and practice

Anastomotic urethroplasty

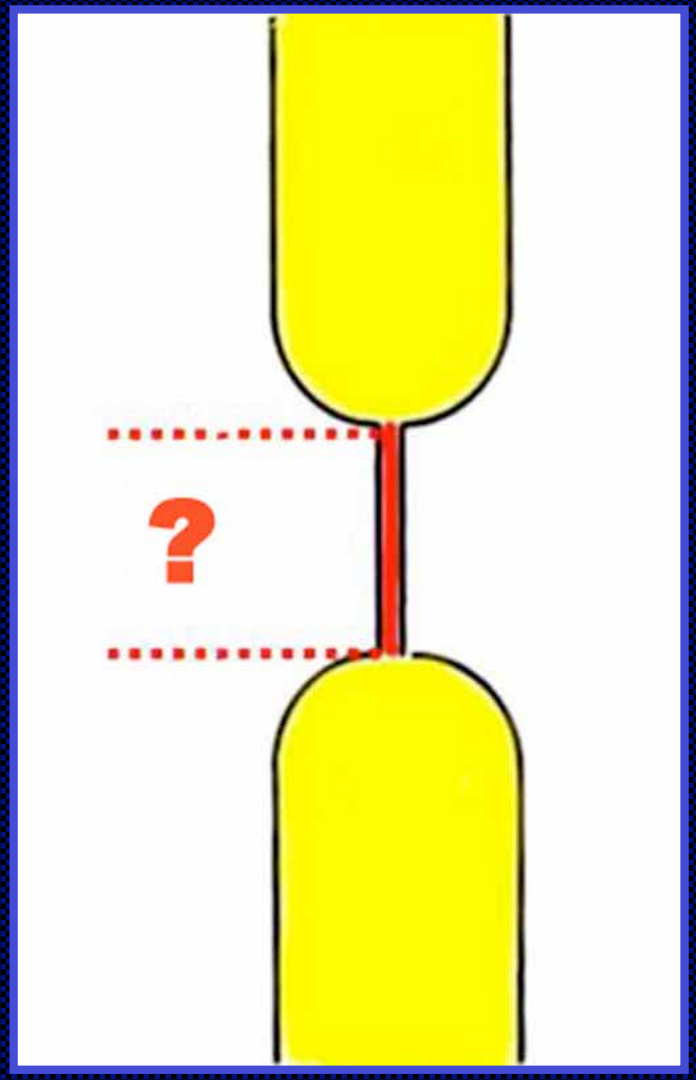
- End-to-end anastomosis
- Augmented roof-strip anastomosis

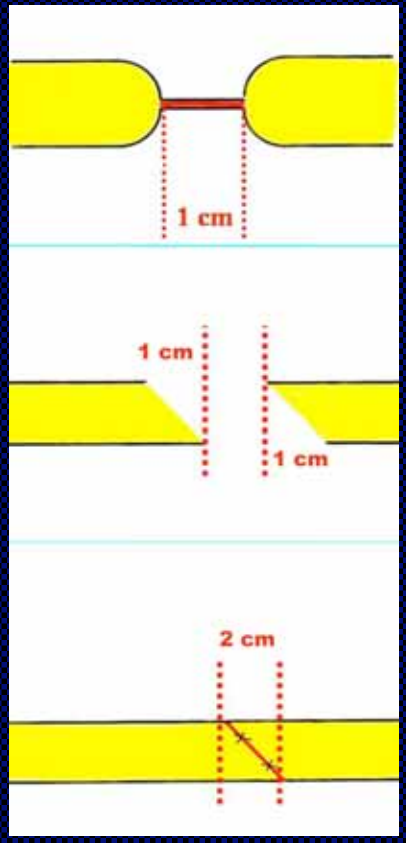


Bulbar urethra

End-to-end anastomosis

Length

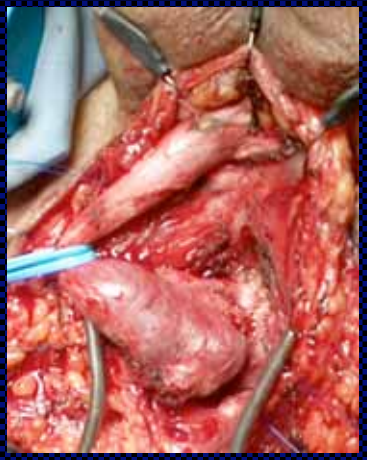




Bulbar urethral stricture of 1 cm or less

Penile chordee due to excessive urethral shortening

Guralnick and Webster, J Urol 2001



Urethral reconstructability is proportional to the length and elasticity of the distal urethra

Morey et al., J Urol 2006

authors	patients	length	success rate
Santucci et al. 2002	168	1 to 4.5 cm	95%
Morey et al. 2006	22	2.6 to 5 cm	91%
Eltahawy et al. 2005	213	1 to 4.5 cm	98%

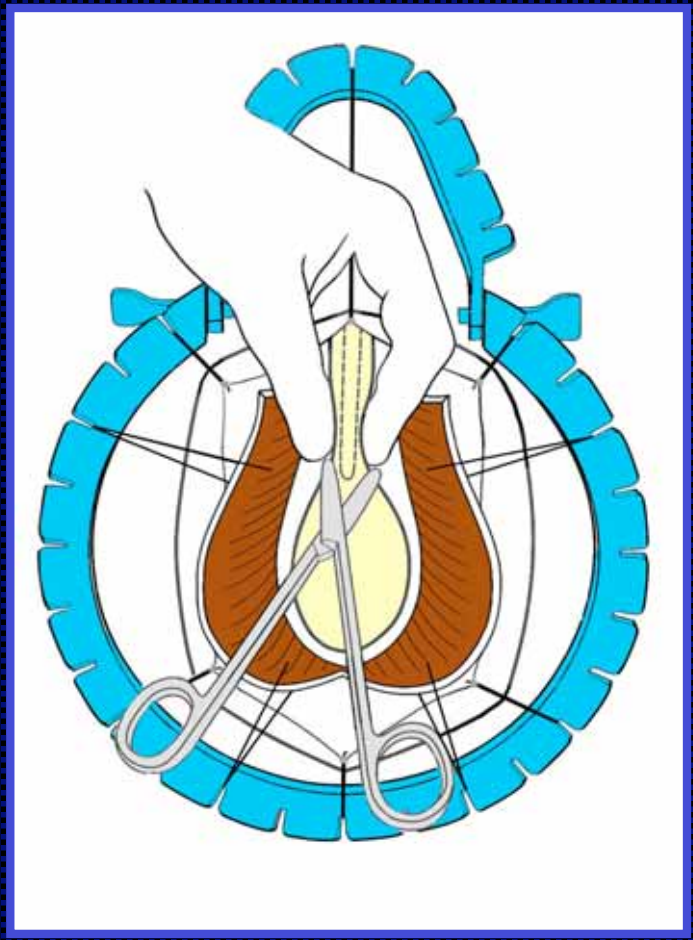
Success rate according to stricture length in 165 patients with bulbar urethral strictures

patients	%	length	success rate	failure
98	59.4%	1-2 cm	93.8%	6.2%
63	38.2%	2-3 cm	85.7%	14.3%
3	1.8%	3-4 cm	100%	
1	0.6%	4-5 cm	100%	

Barbagli 2006, unpublished data

End-to-end anastomosis

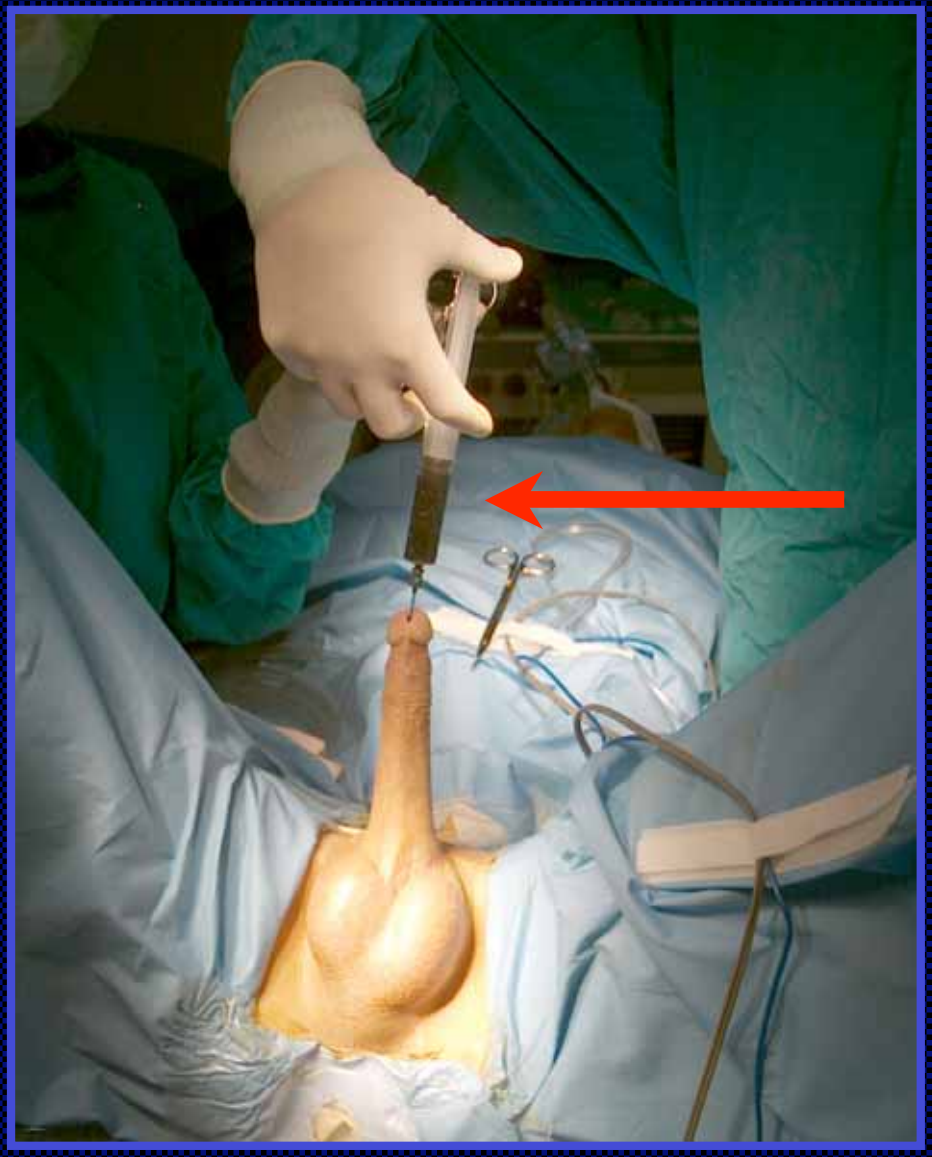
Surgical technique: step by step



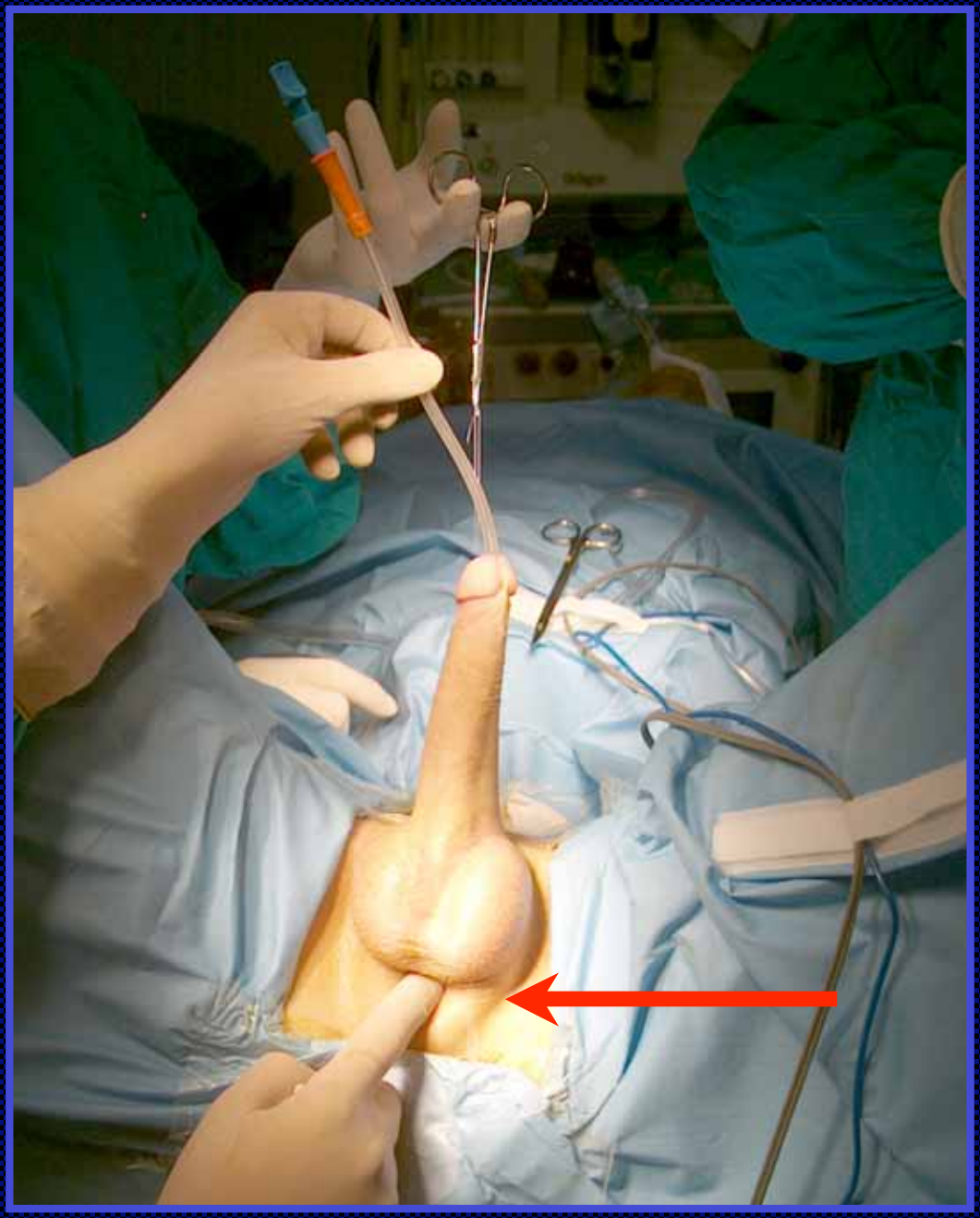
Preparation of the patient

Allen stirrups with sequential inflatable compression sleeves

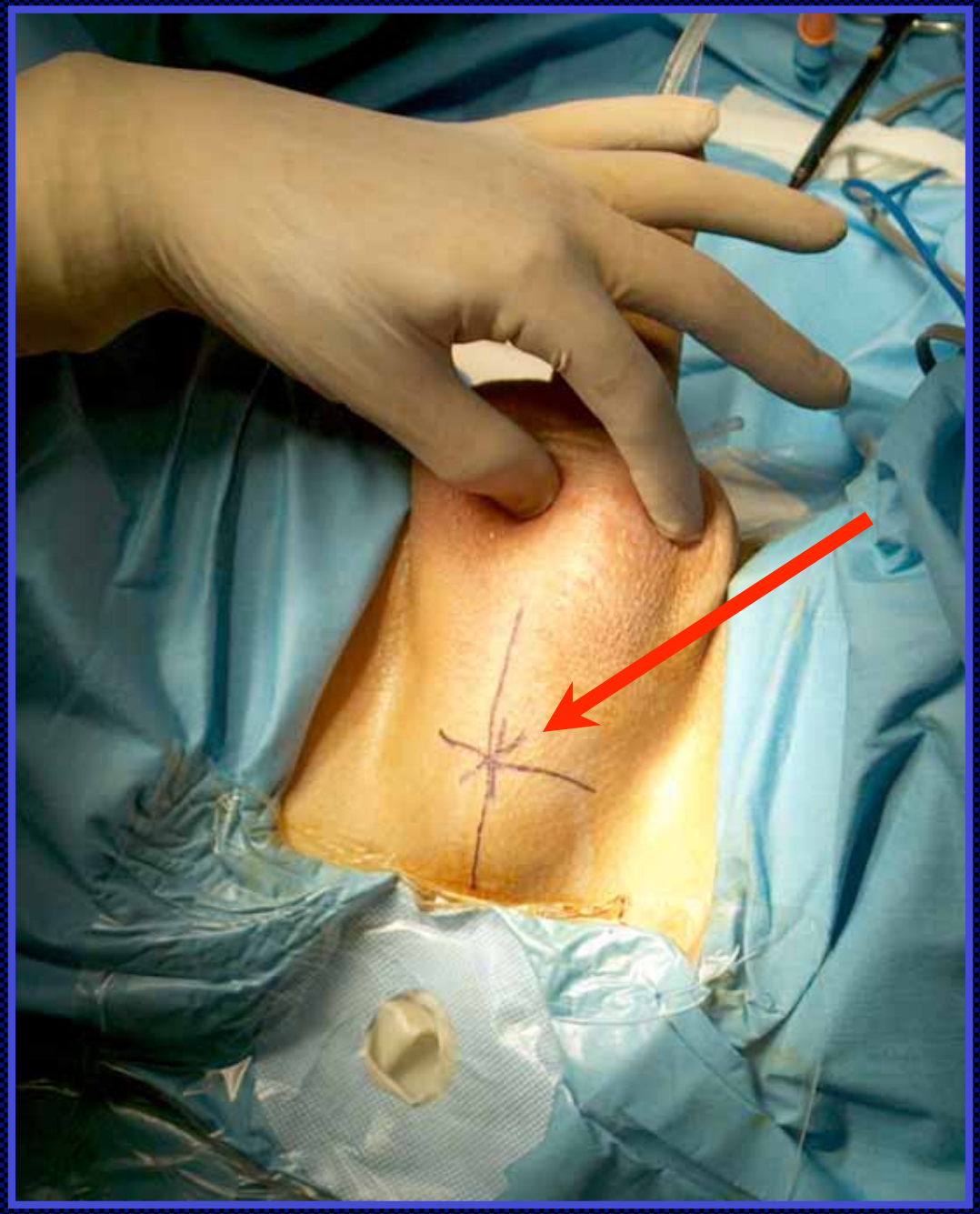
Simple lithotomy position



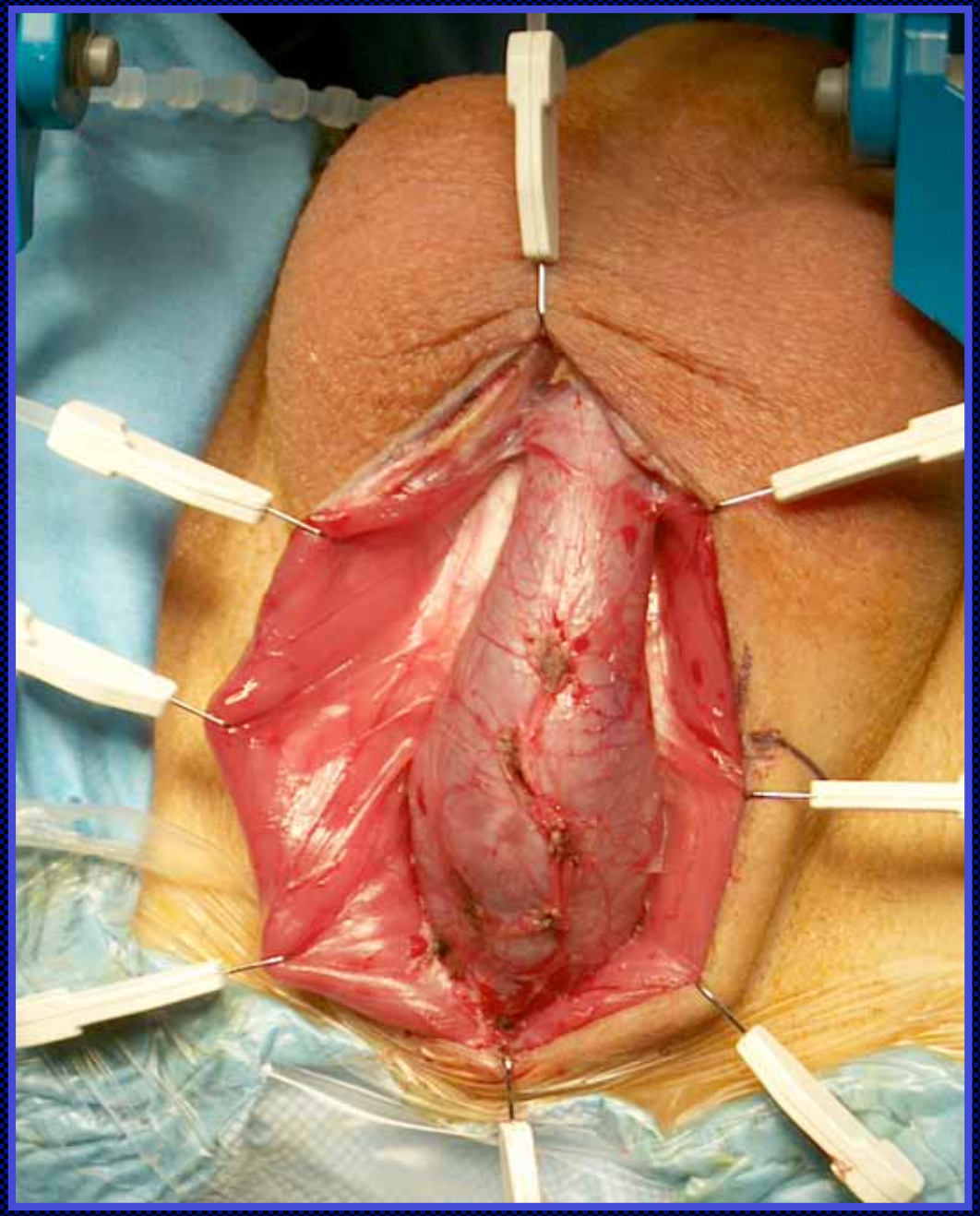
Methylene blue is injected into the urethra



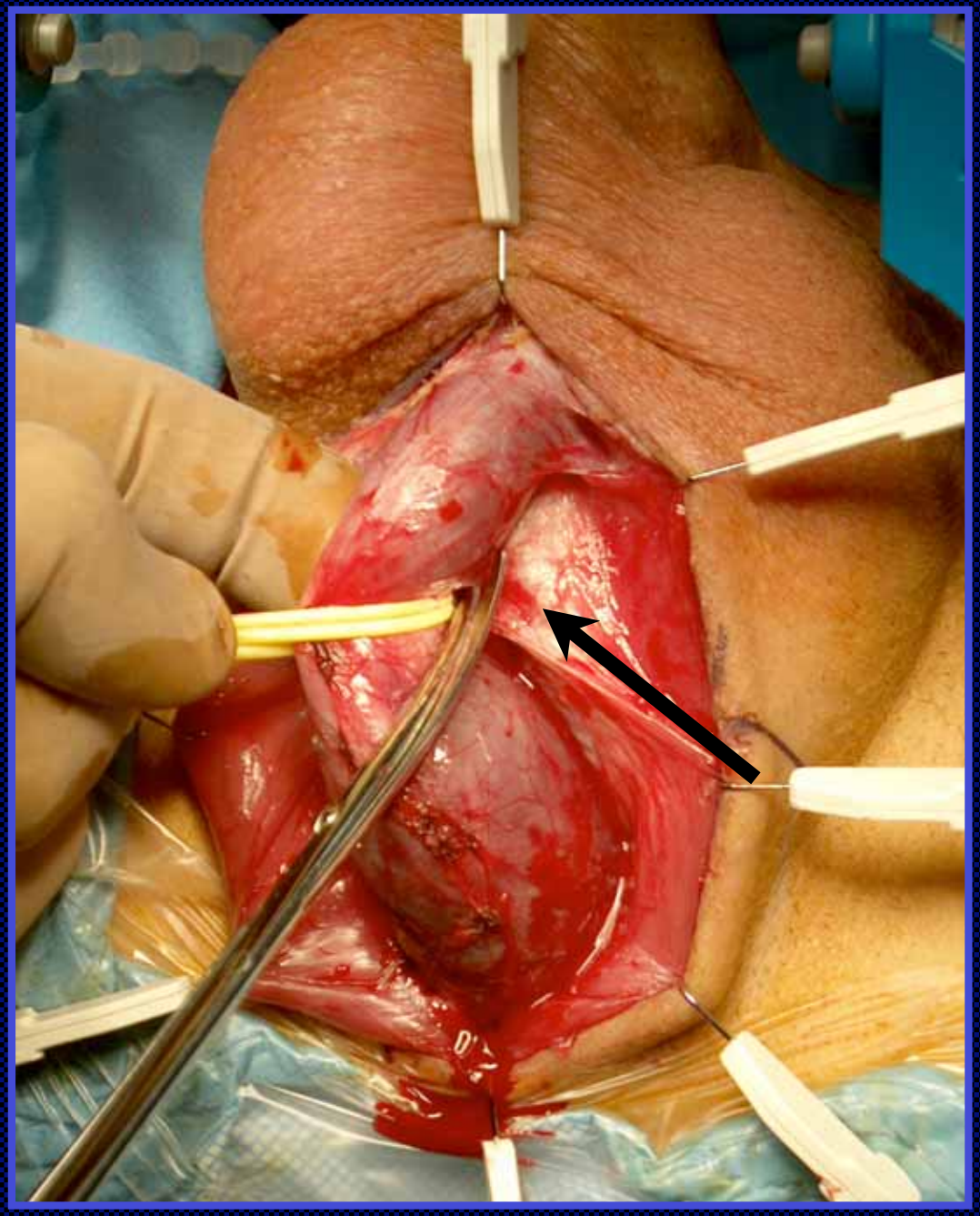
The distal extent of the stenosis is identified by inserting a 16-French catheter with a soft round tip



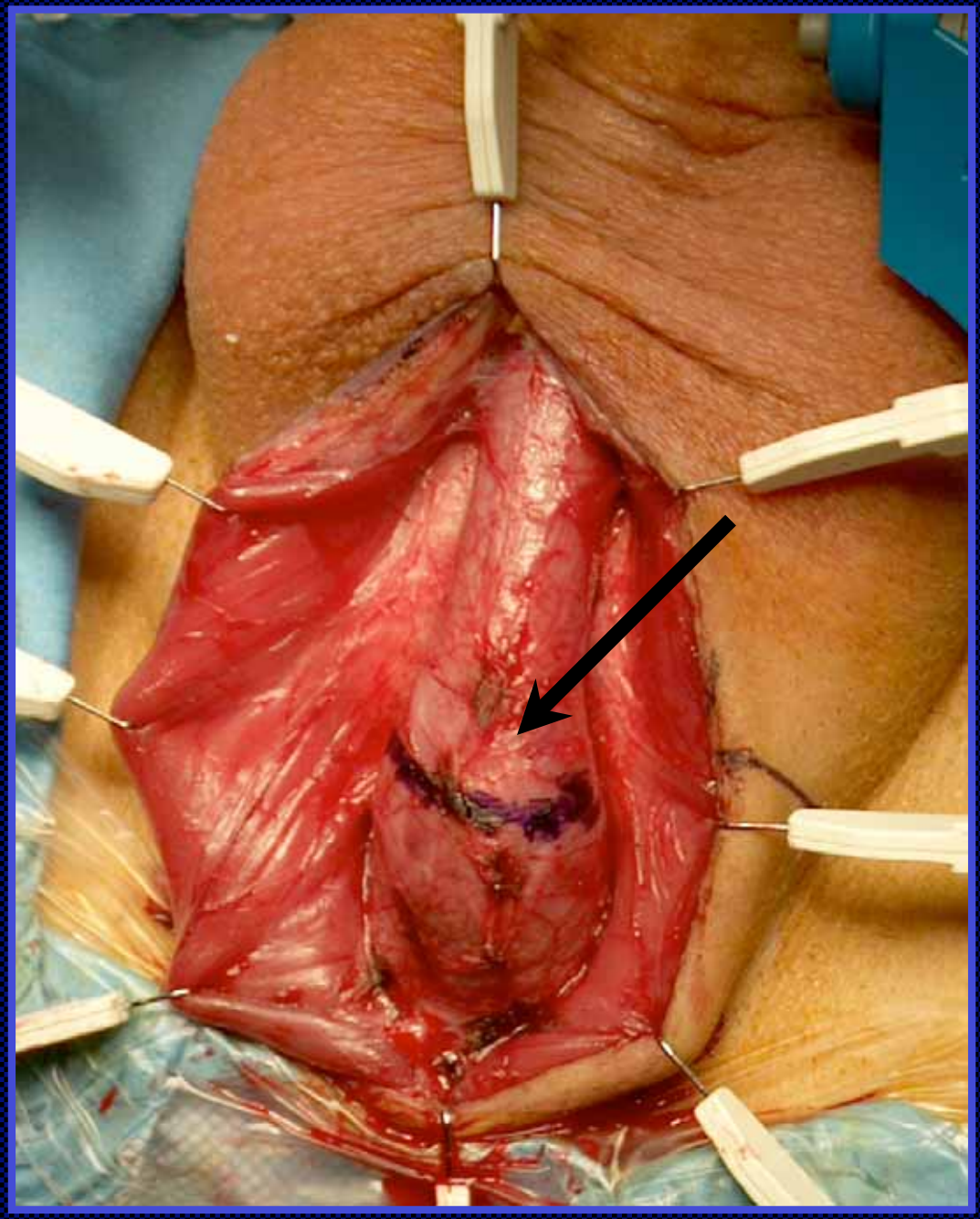
Midline perineal incision



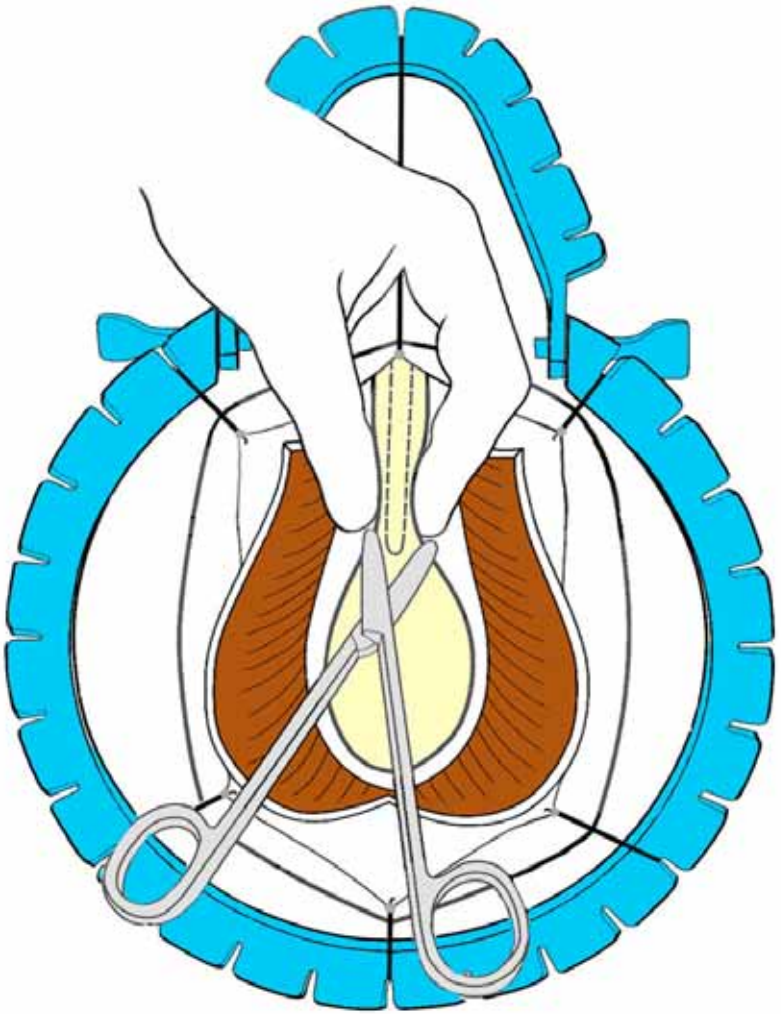
The urethra is freed from the bulbocavernous muscle

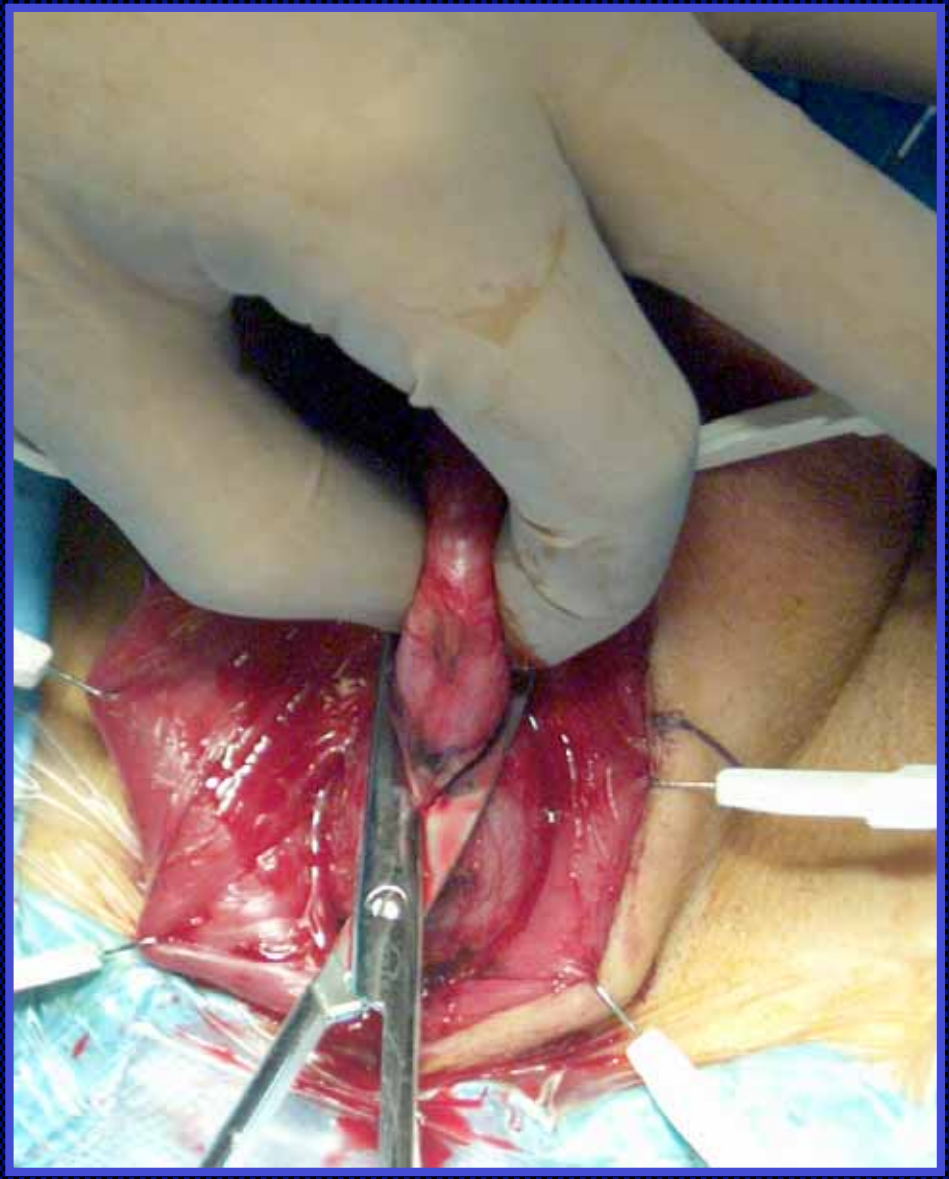


The urethra is dissected from the corpora cavernosa

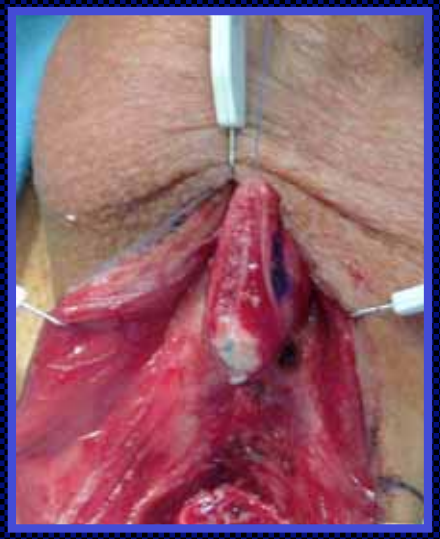


The distal extent of the stenosis is identified and outlined

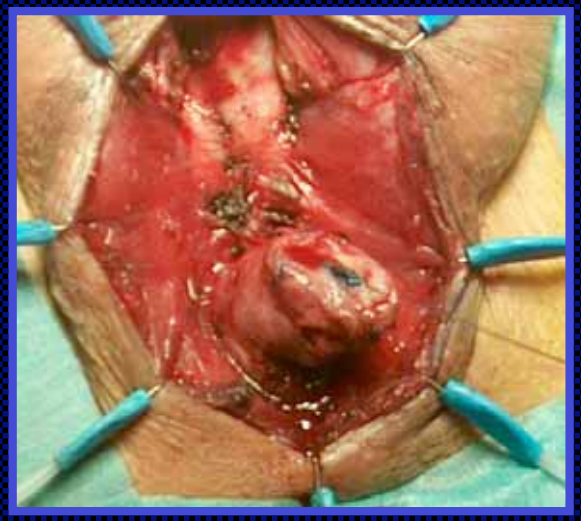




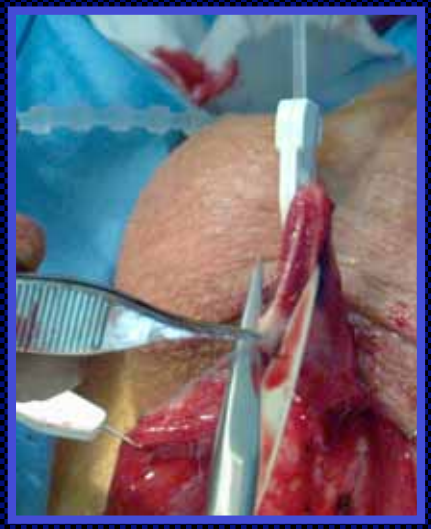
The urethra is transected at the stricture level

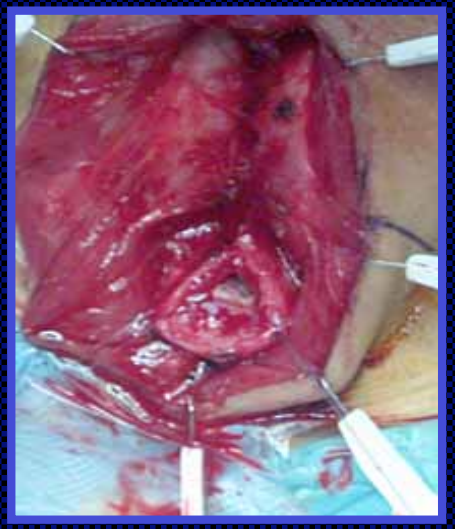


distal end

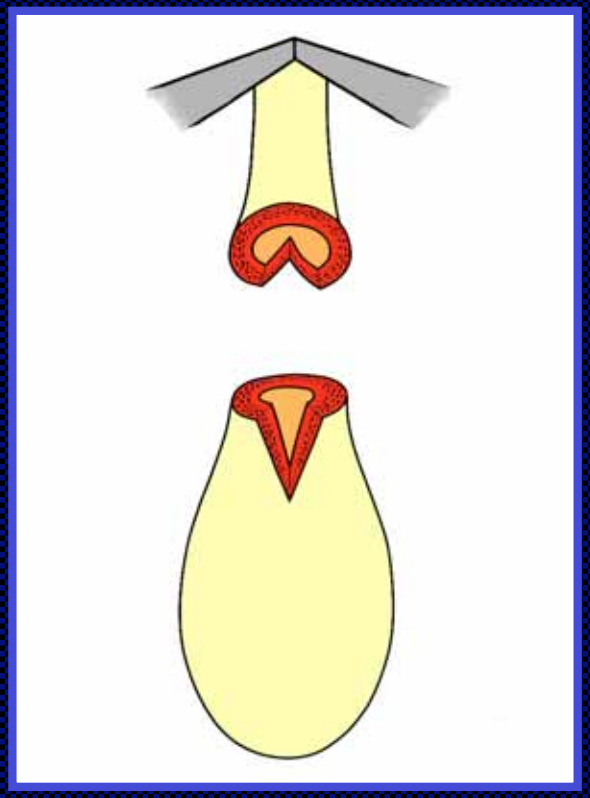


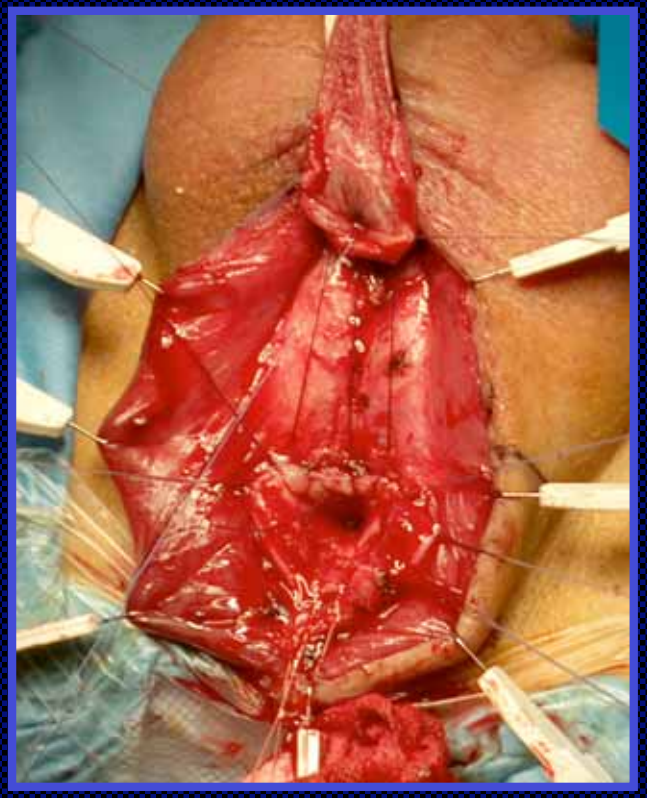
proximal end





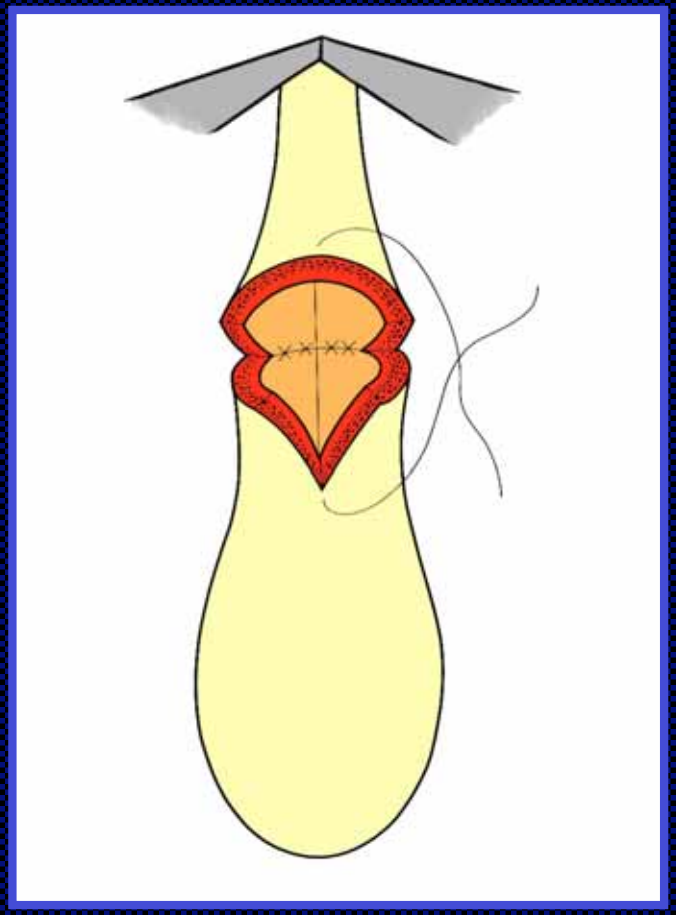
The stricture is removed

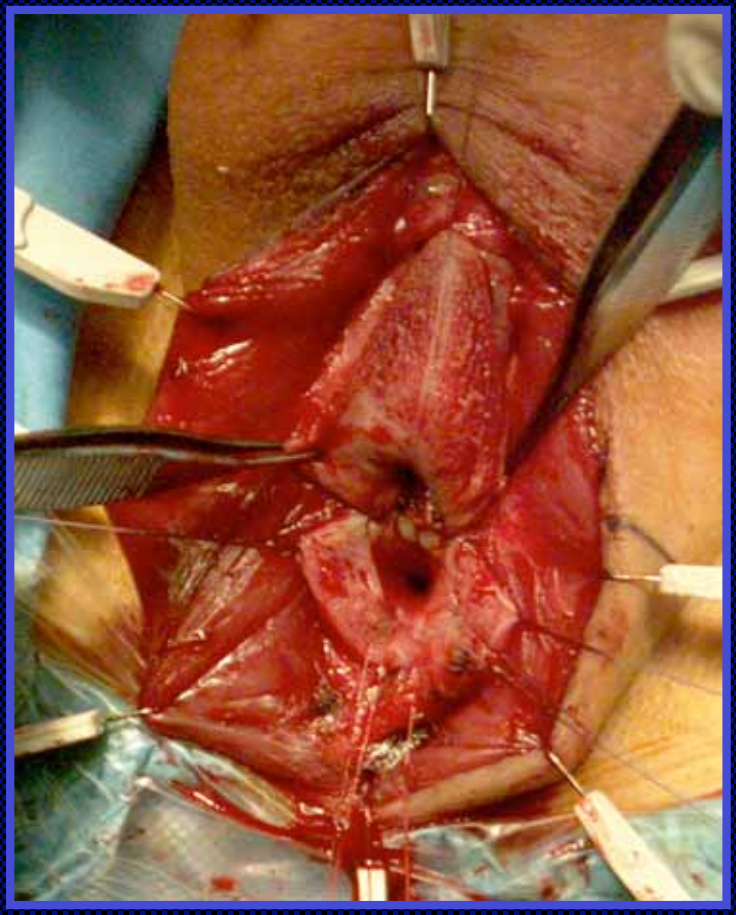




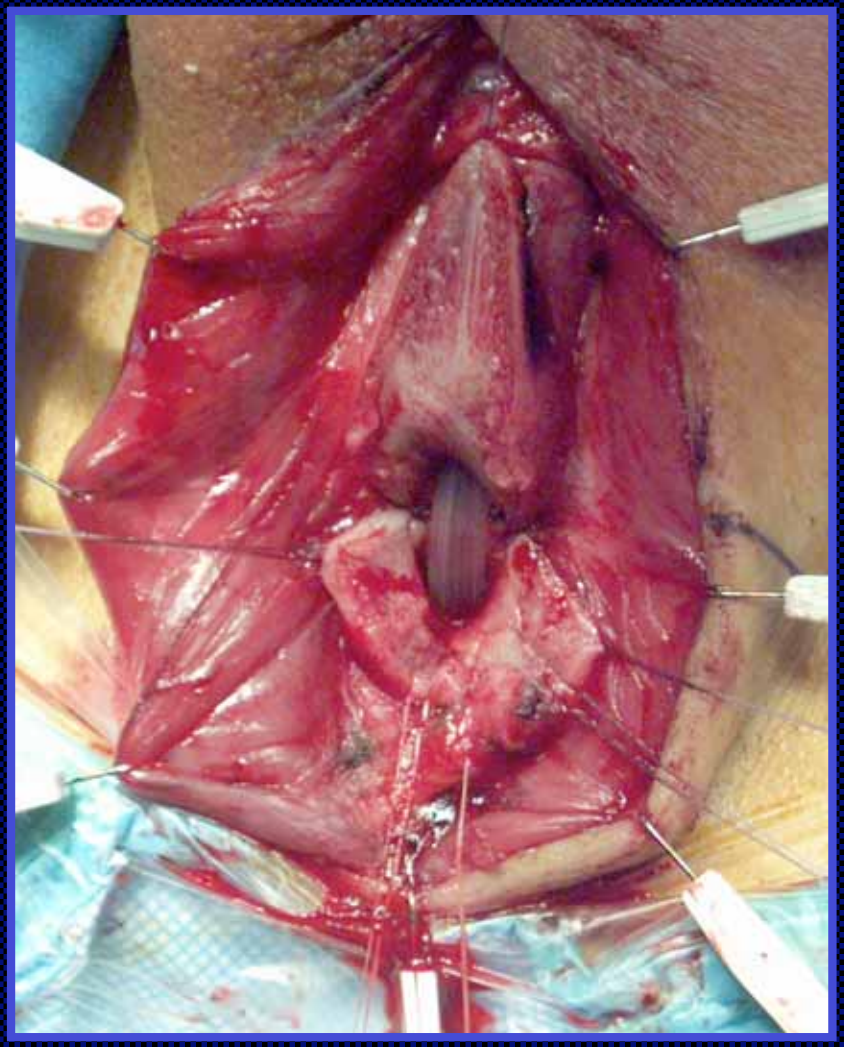
The urethra is spatuled for 1 cm on both ends

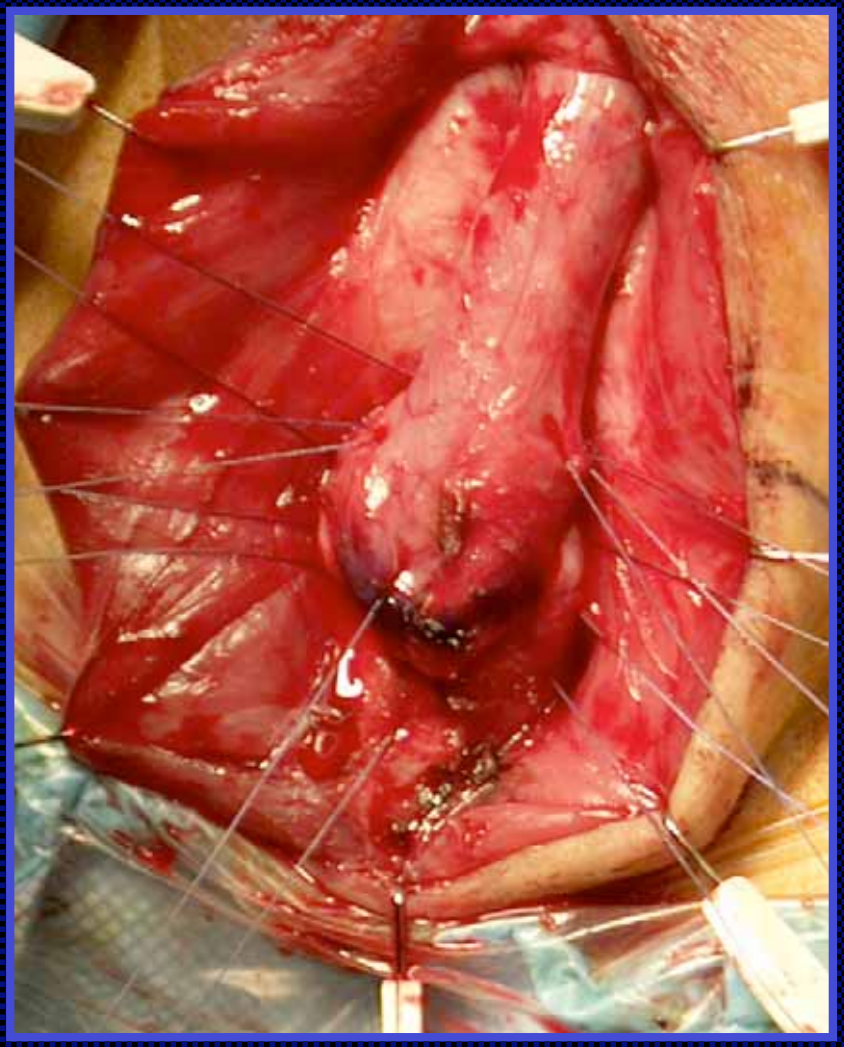
A total of 10 interrupted 4-zero polyglactin sutures are put in place before tying



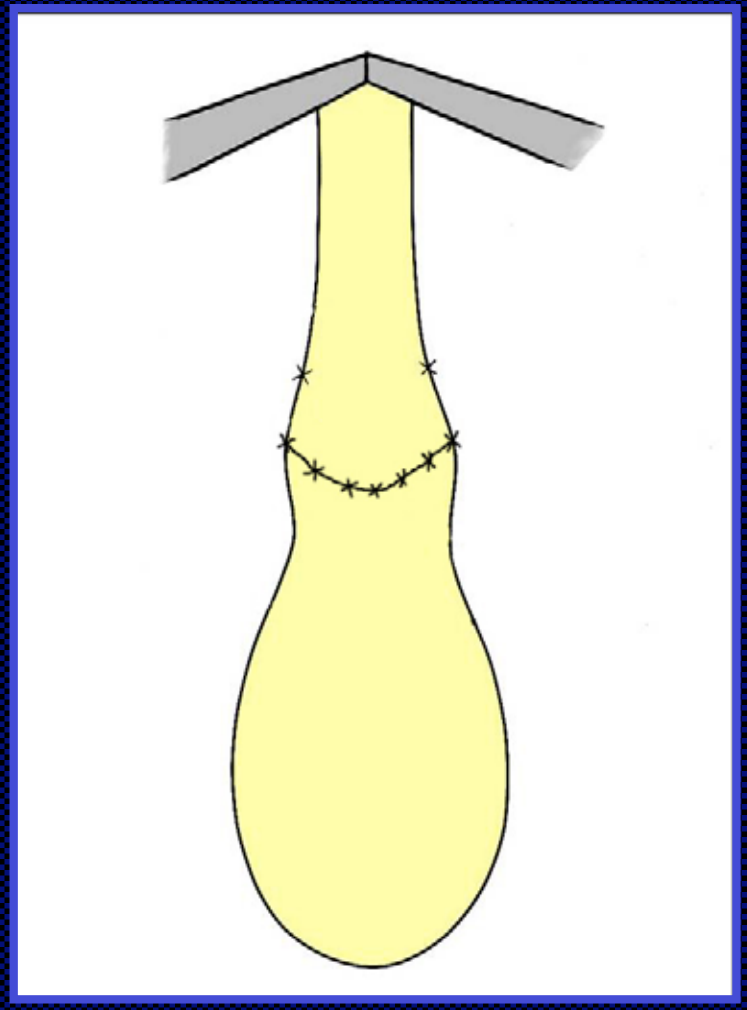


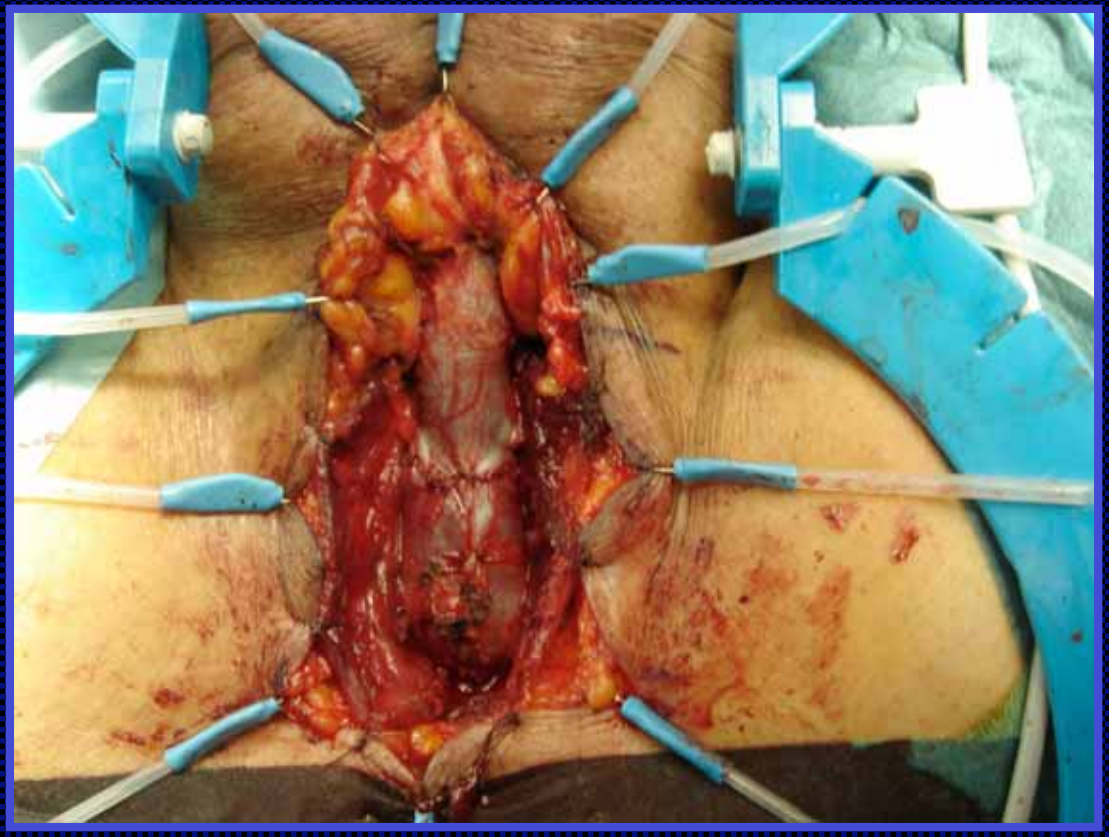
The anastomosis is completed on the roof



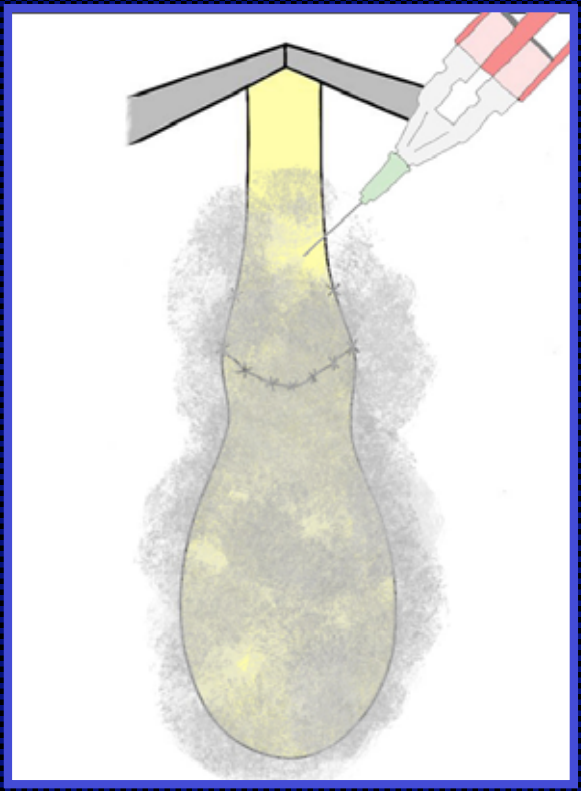


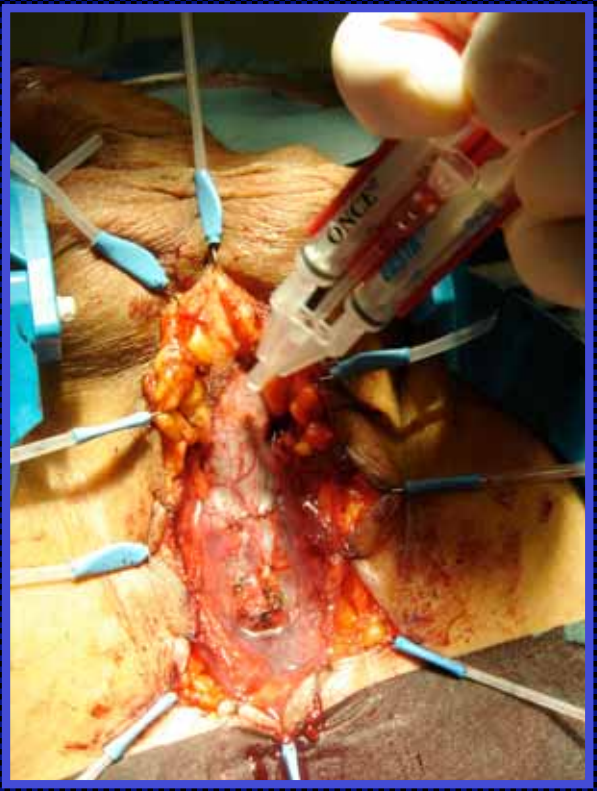
A Foley 16-French grooved silicone catheter is inserted and the urethra is closed

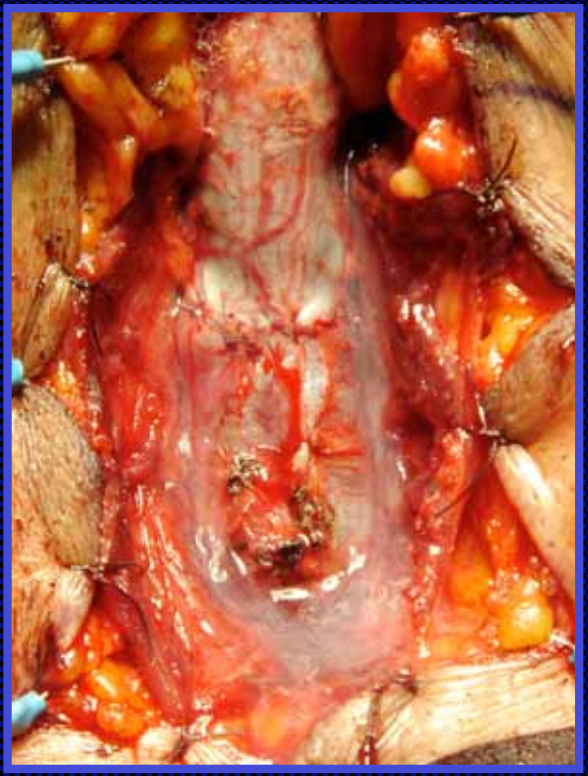




The anastomosis is completed



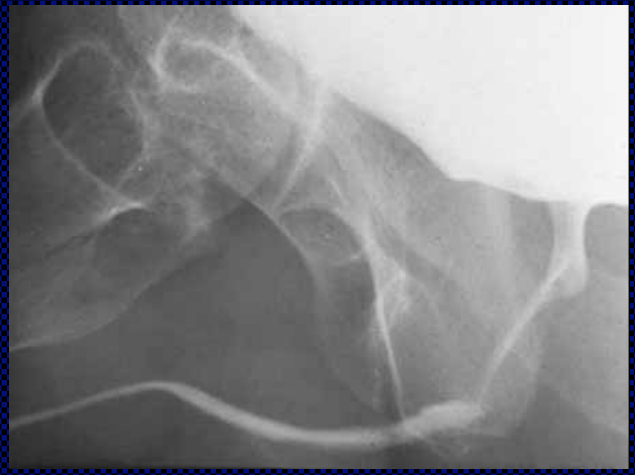




Two ml of fibrin glue are injected over the urethra to prevent urinary leakage

Post-operative care

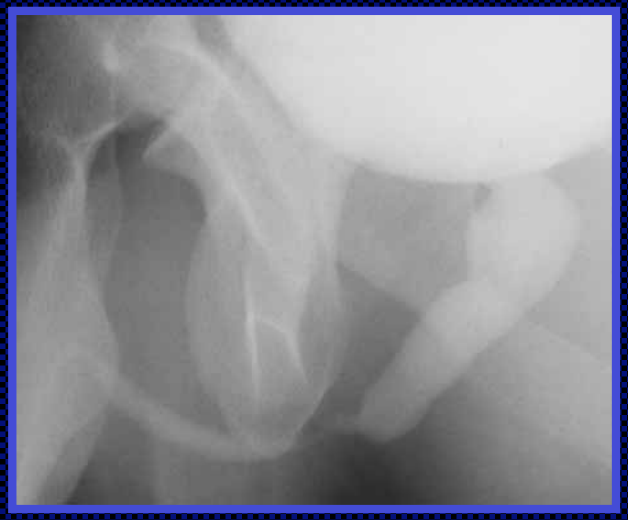
- Patient is discharged from the hospital three days after surgery
- Patient is maintained on oral antibiotics until the catheter is removed
- Two weeks following surgery, the catheter is removed and voiding cysto-urethrography is obtained



Post-operative complications

- Urethrorrhagia due to nocturnal erection
- Temporary numbness or dysesthesia to the perineum
- Scrotal swelling
- Urethral fistula (4.8%)

Urethro-perineal fistula



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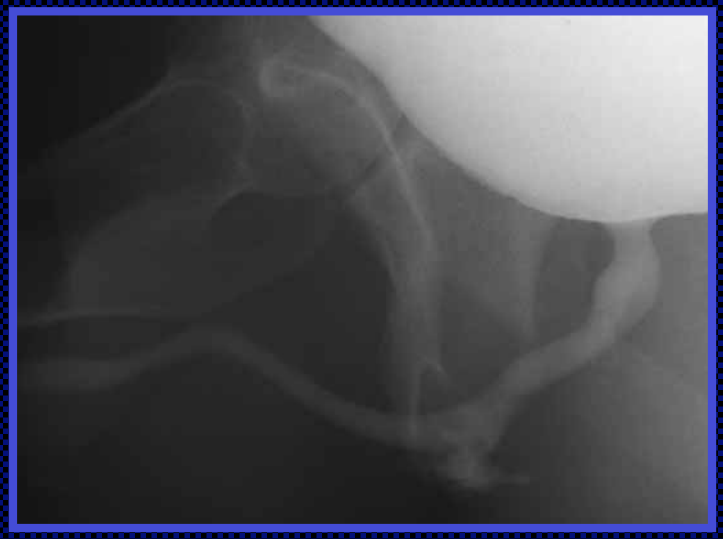
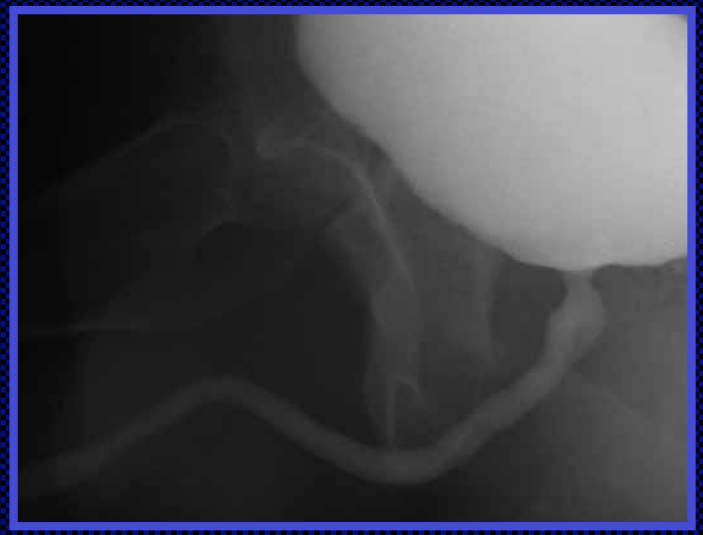
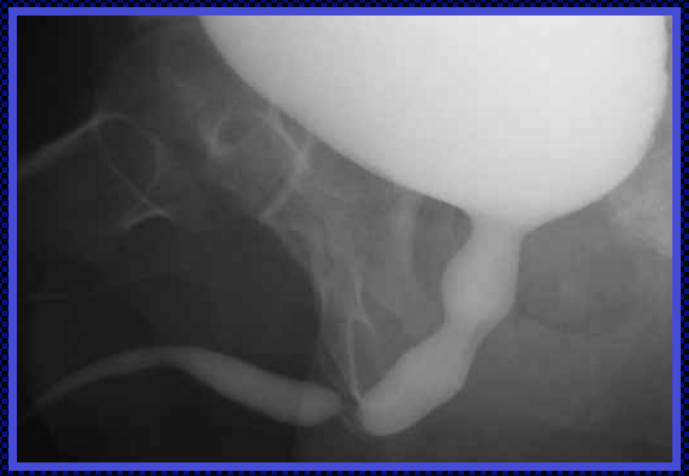


post 1



post 2

Urethro-perineal fistula



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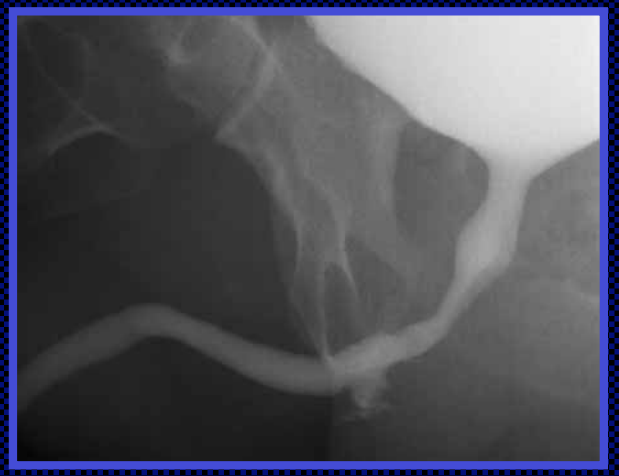
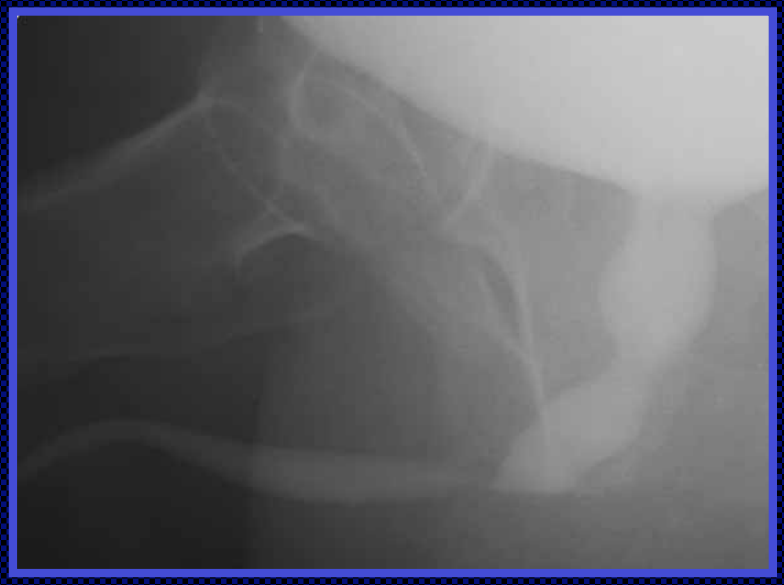
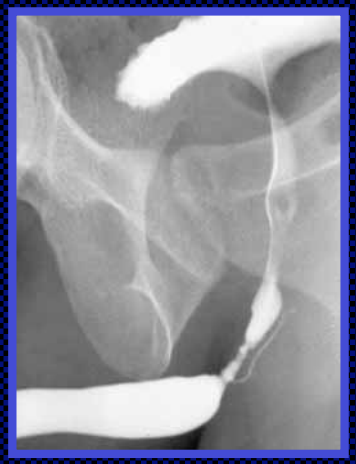


post



6 months later

No free-tension anastomosis



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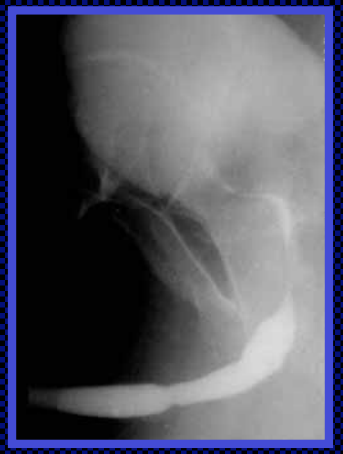

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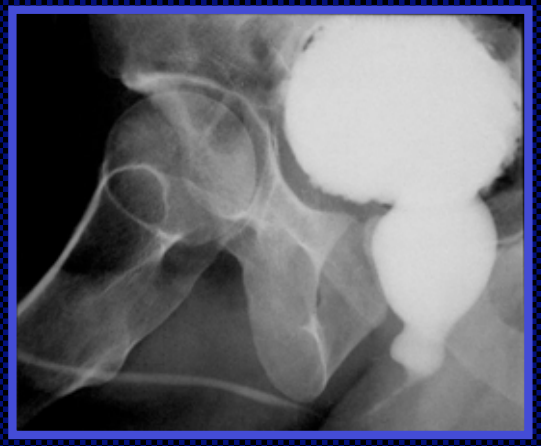
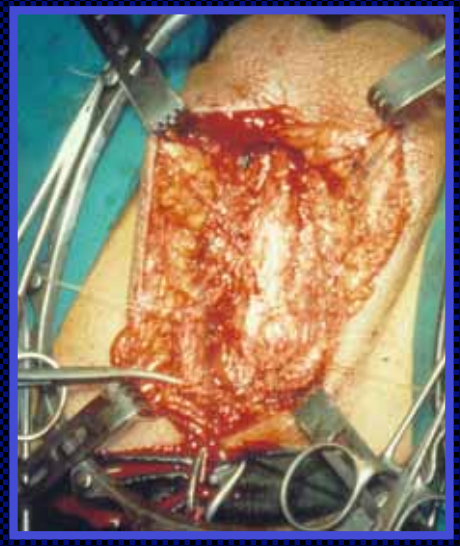


6 months later



end–to–end anastomosis

authors	patients	mean follow-up	success rate
Jakse et al. 1986	105	45	93%
Martinez-Pinero et al. 1997	150	44	84%
Santucci et al. 2002	168	70	95%
Eltahawy et al. 2005	213	40	98%
Barbagli 2006 unpublished data	165	64	91%

Surgical options in 15 patients following failed end-to-end anastomosis

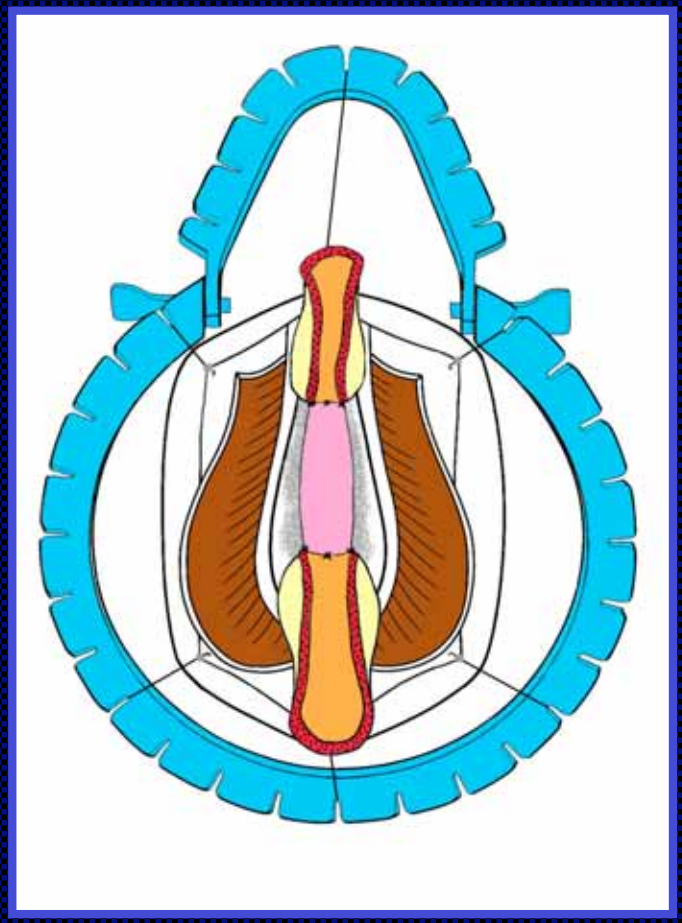
Patients 15

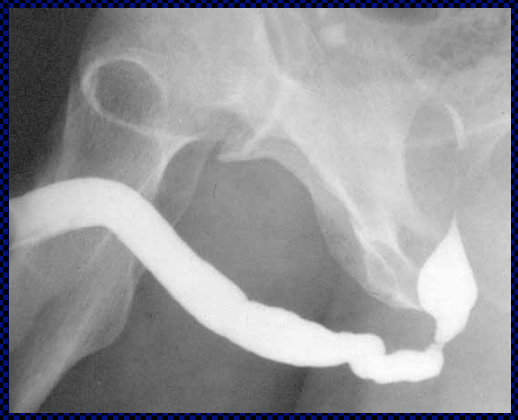
- urethrotomy 9 (60%)
- two-stage repair 3 (20%)
- end-to-end anastomosis 2 (13%)
- buccal mucosal graft urethroplasty 1 (7%)

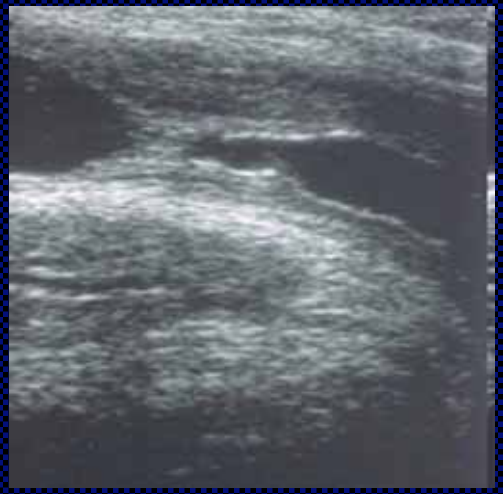
Barbagli 2006, unpublished data

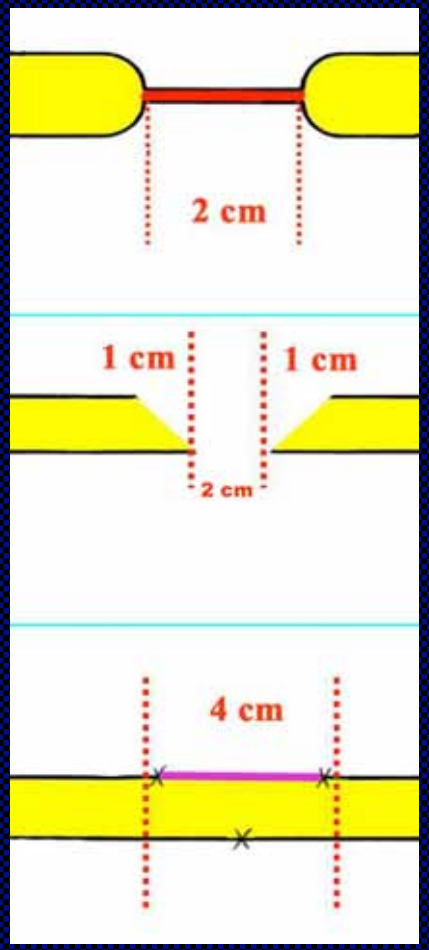
Augmented roof-strip anastomosis

Surgical technique: step by step



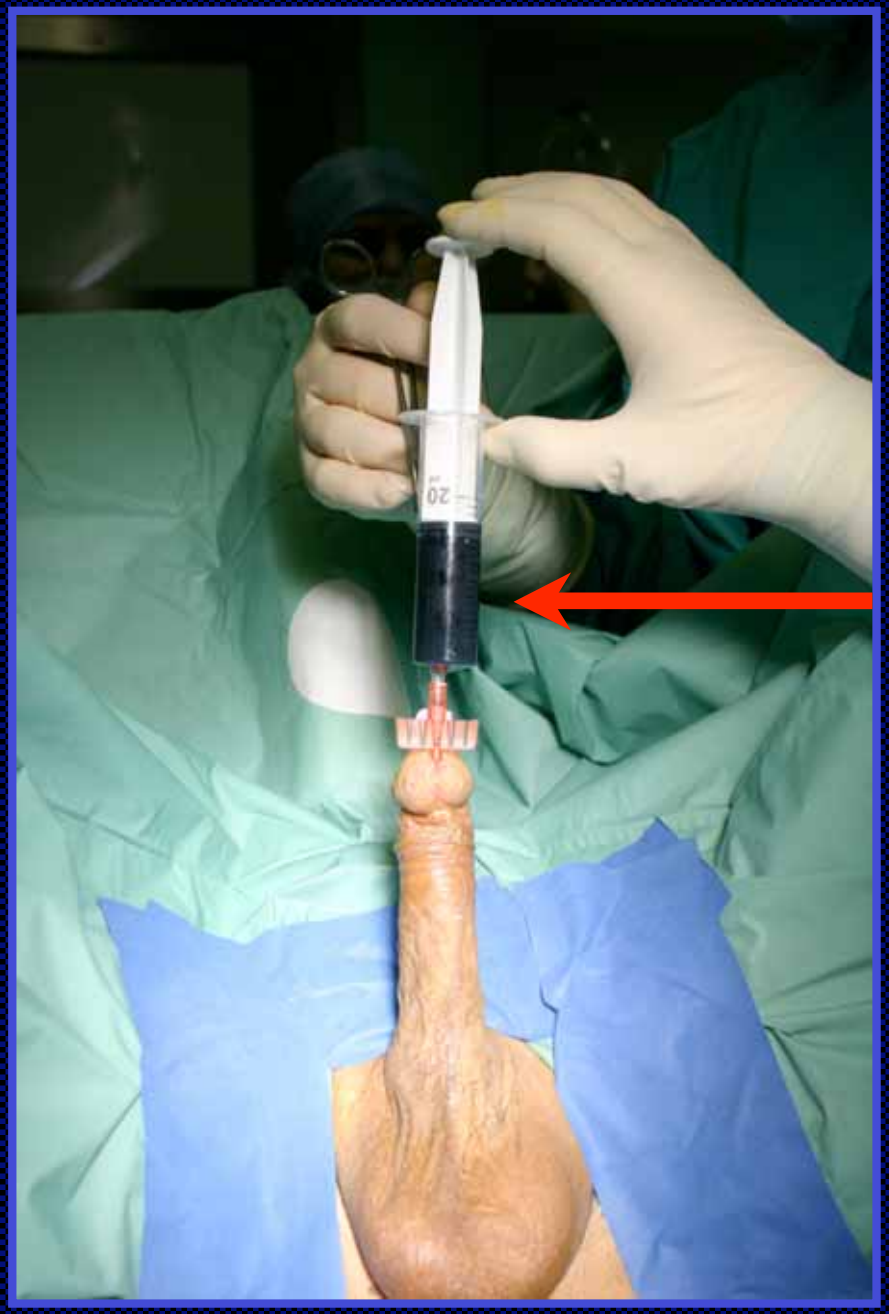




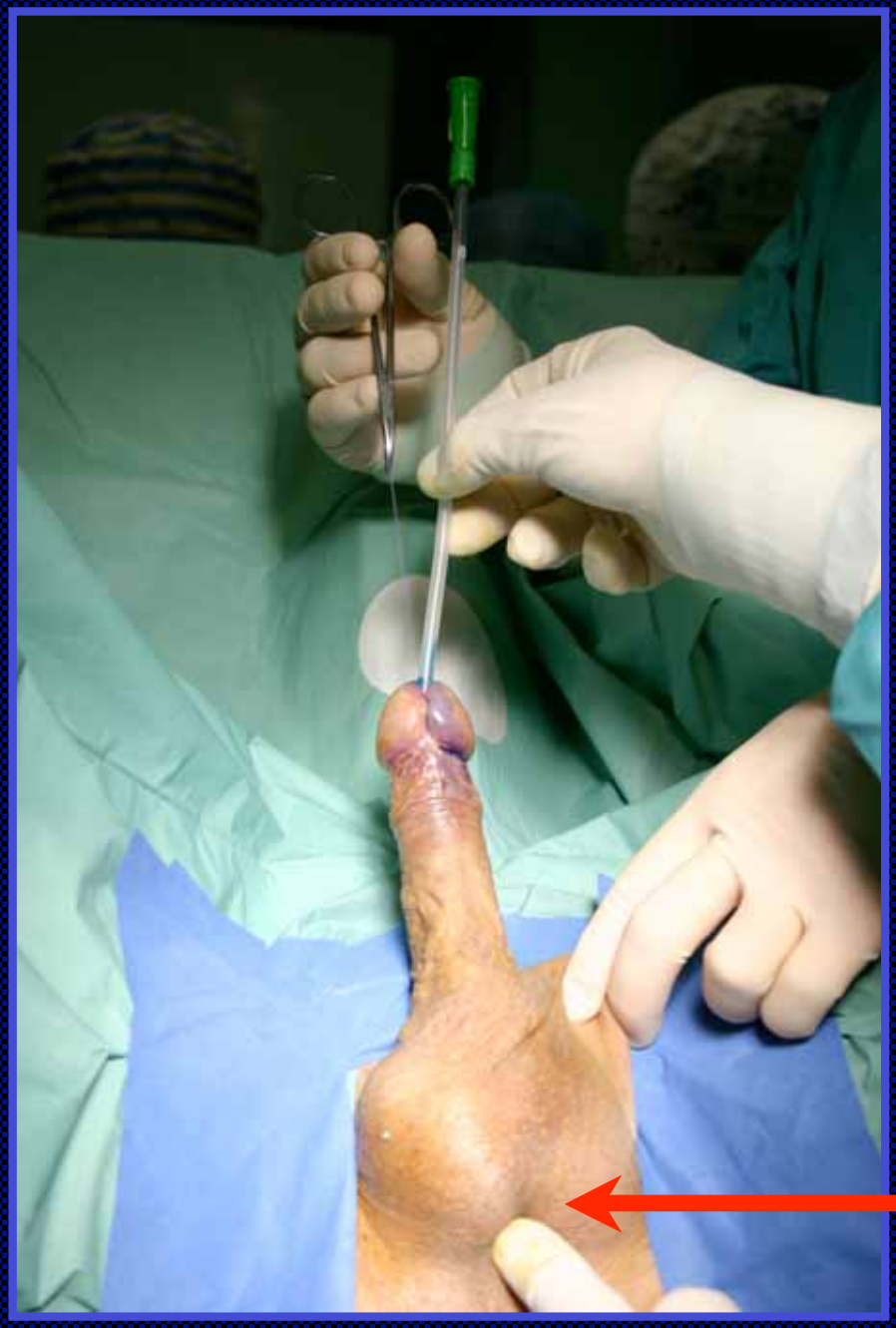


Bulbar urethral stricture of more than 3 cm in length and a stricture that contains a particularly narrow or dense area of 1-2 cm in length

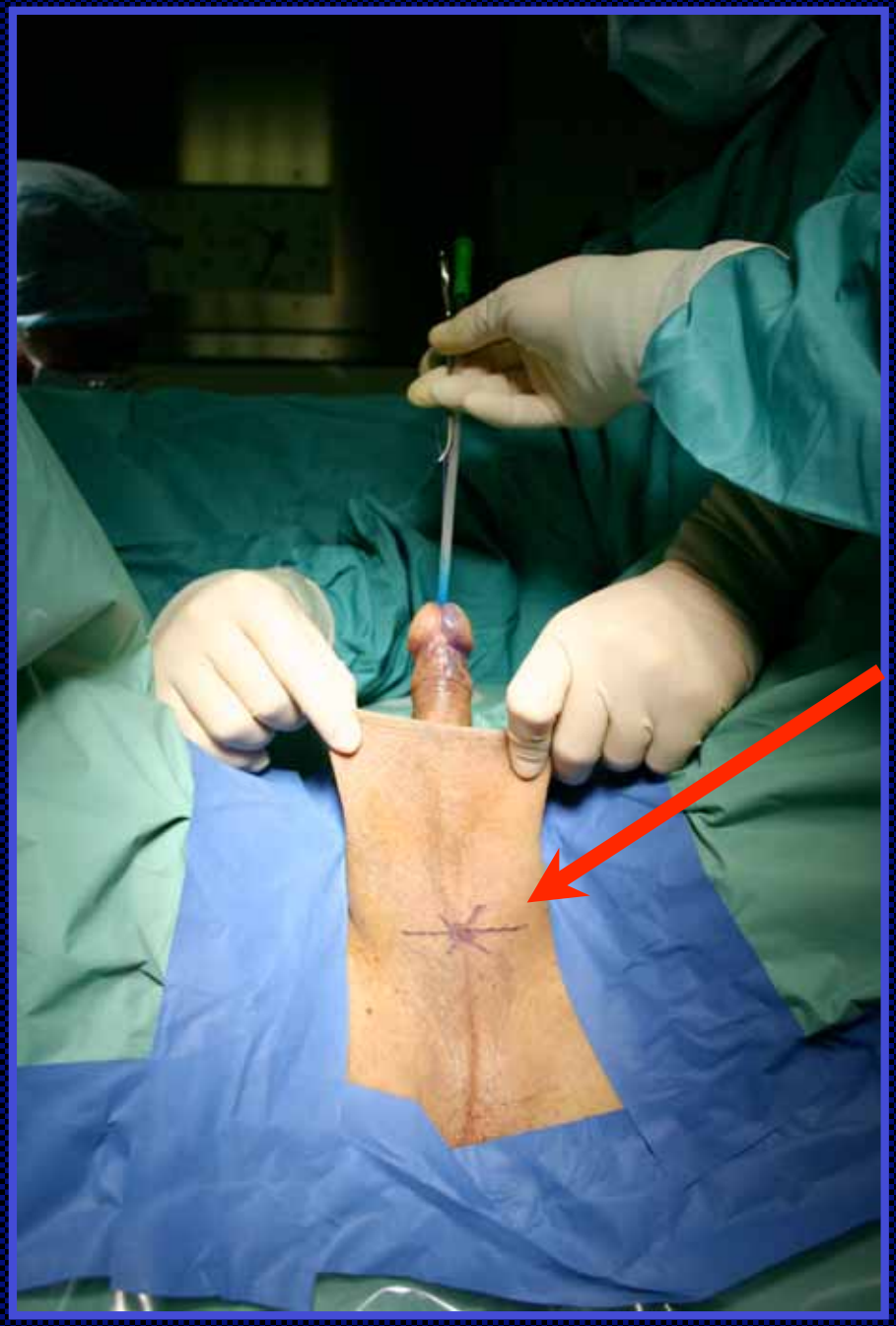
Two surgical teams work simultaneously



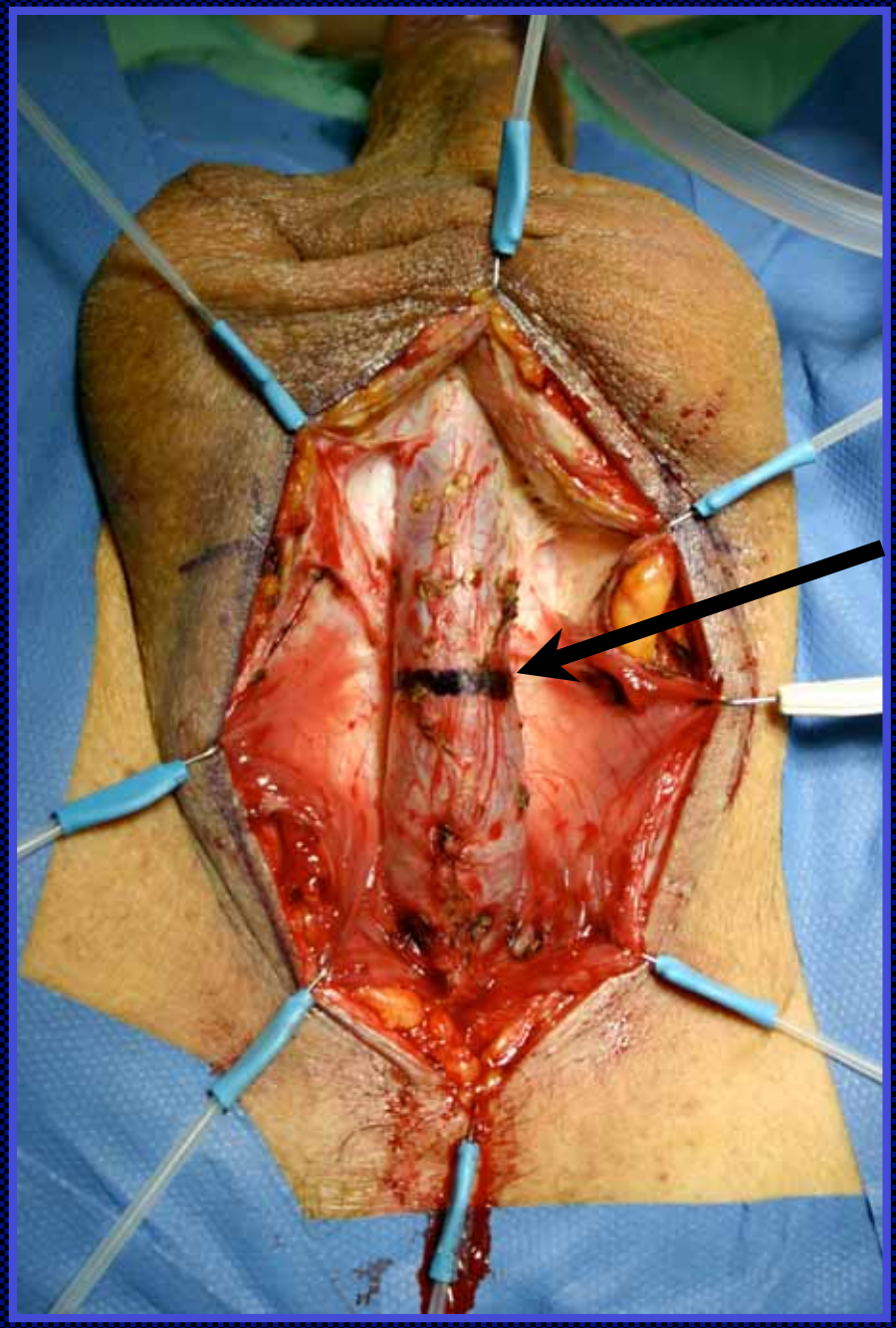
Methylene blue is injected into the urethra



The distal extent of the stenosis is identified by inserting a 16-French catheter with a soft round tip



Midline perineal incision



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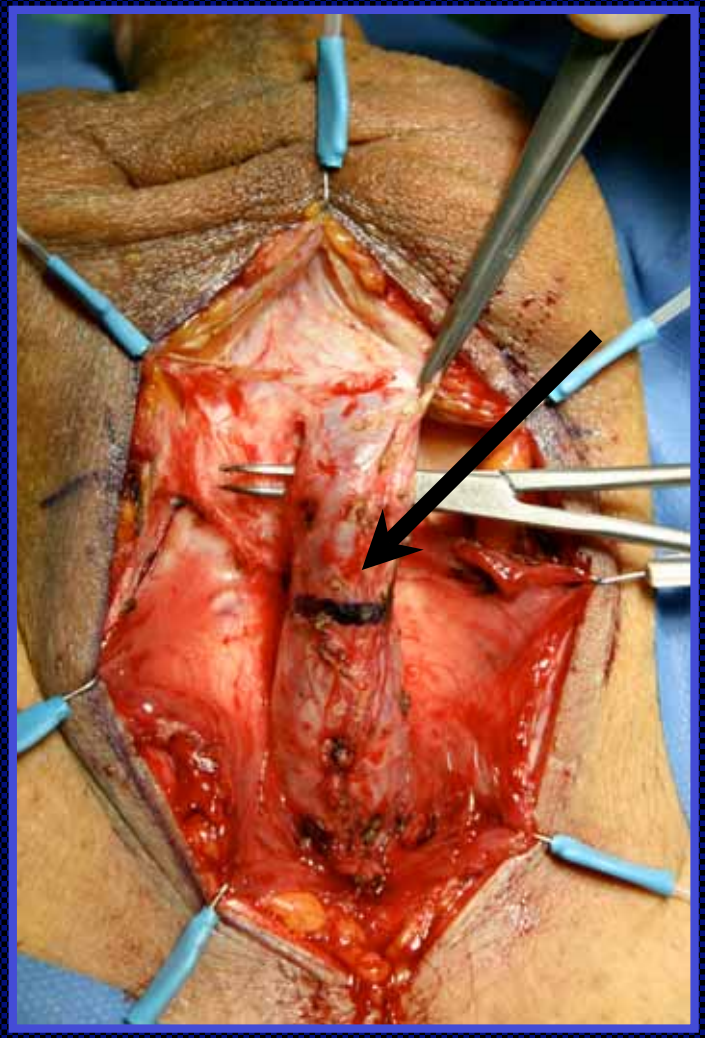
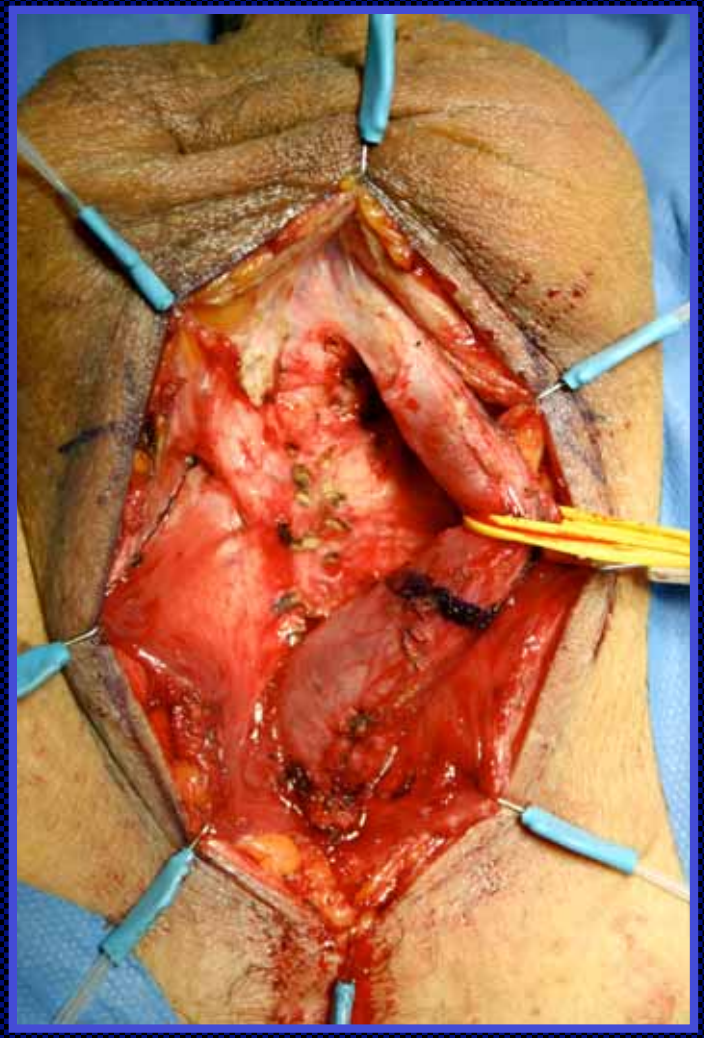
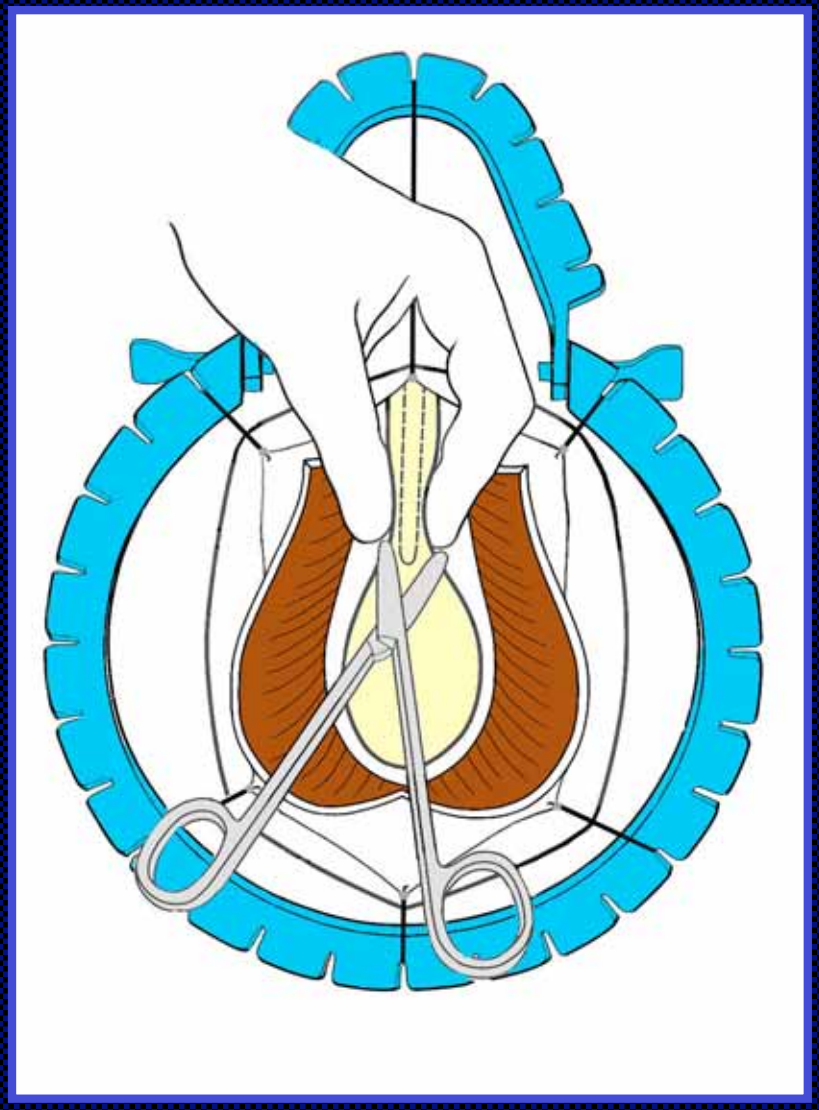
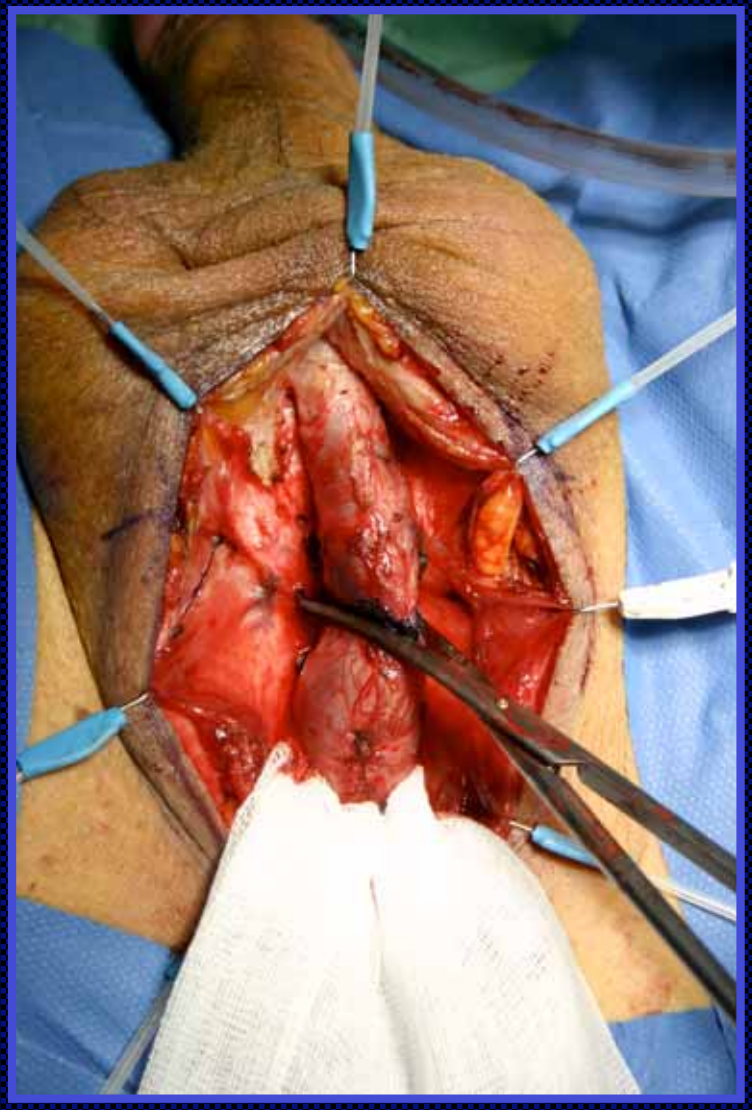


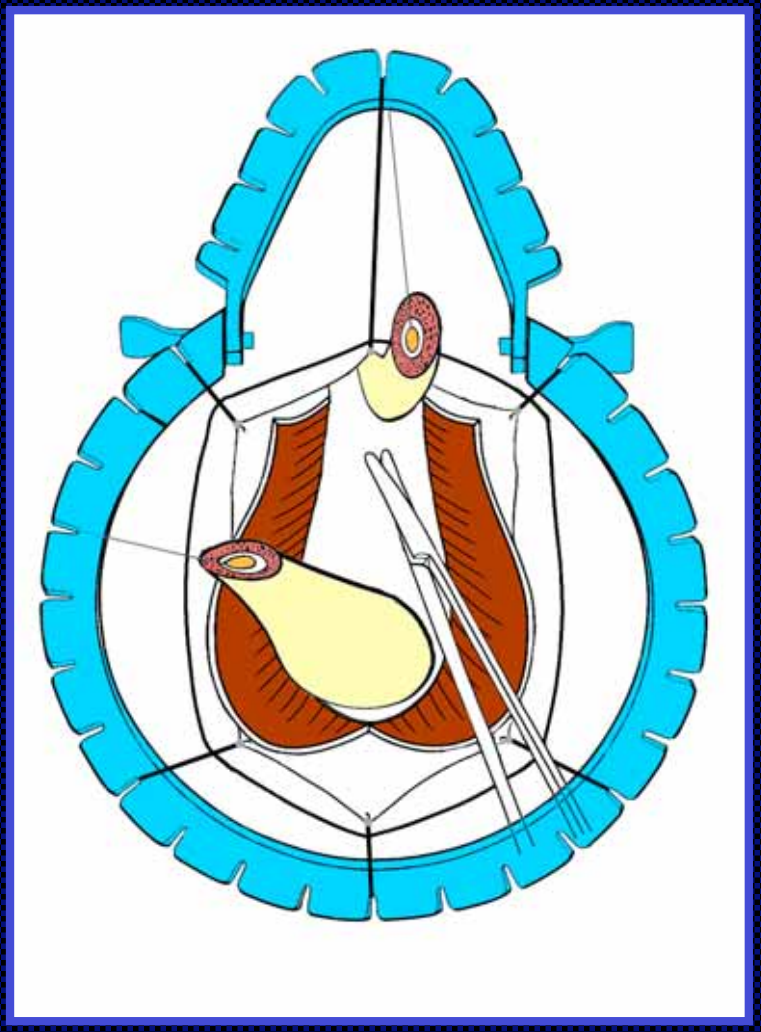


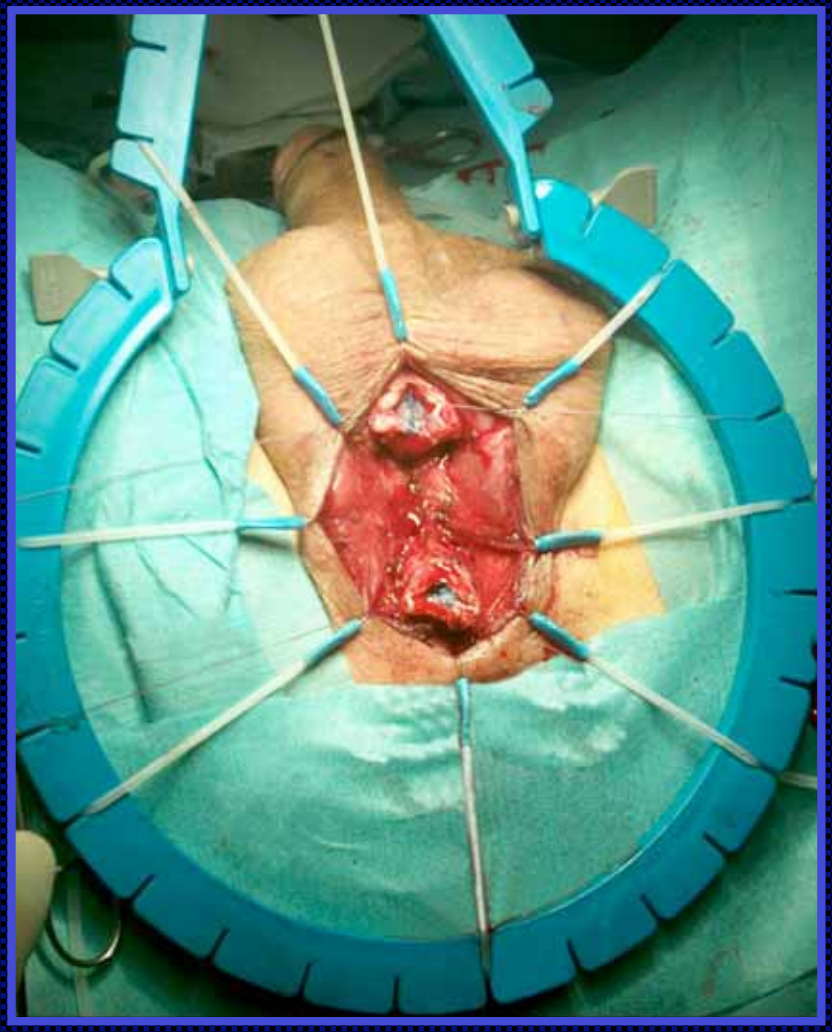
The urethra is dissected from the corpora cavernosa



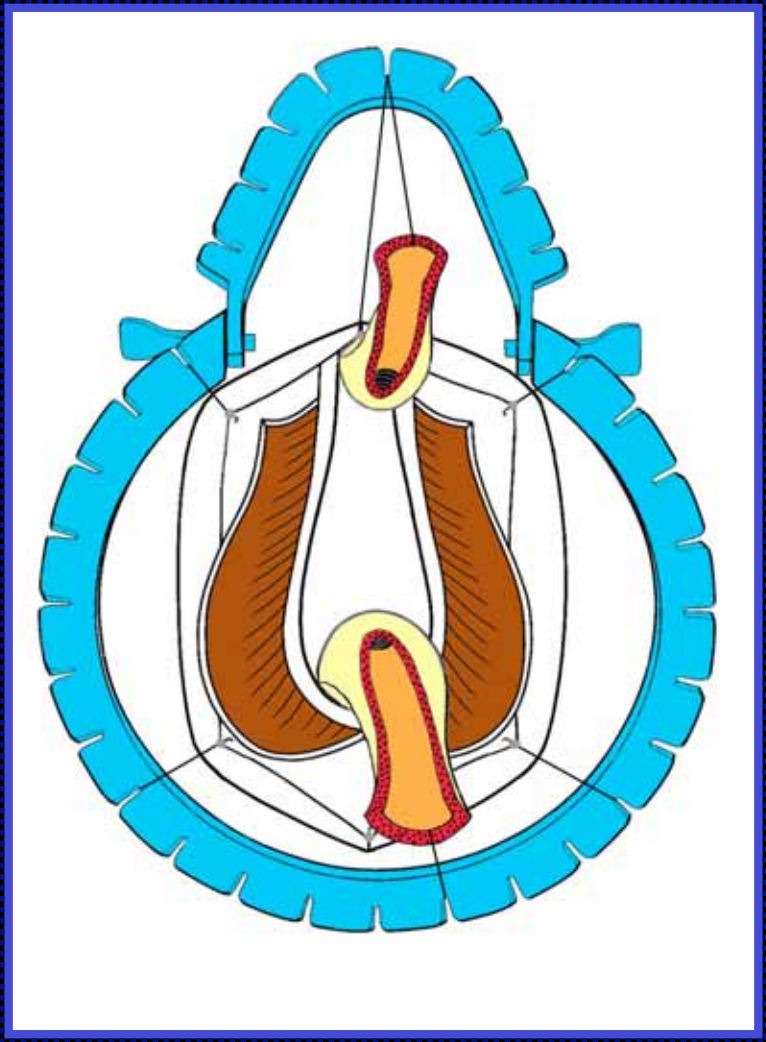


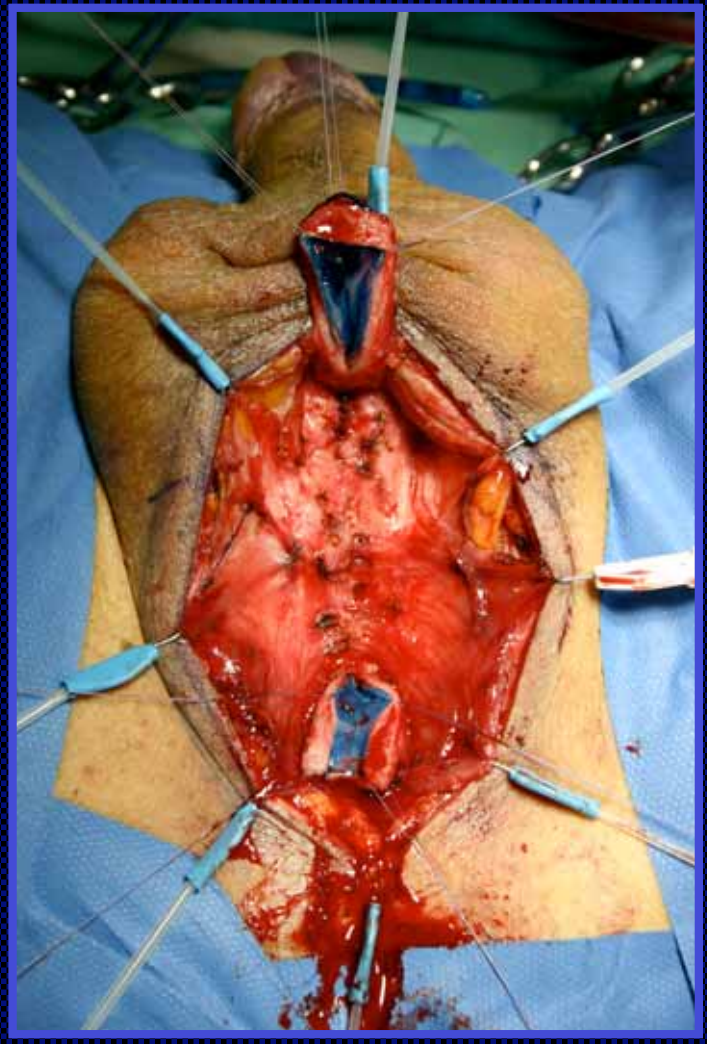
The urethra is transected at the stricture level



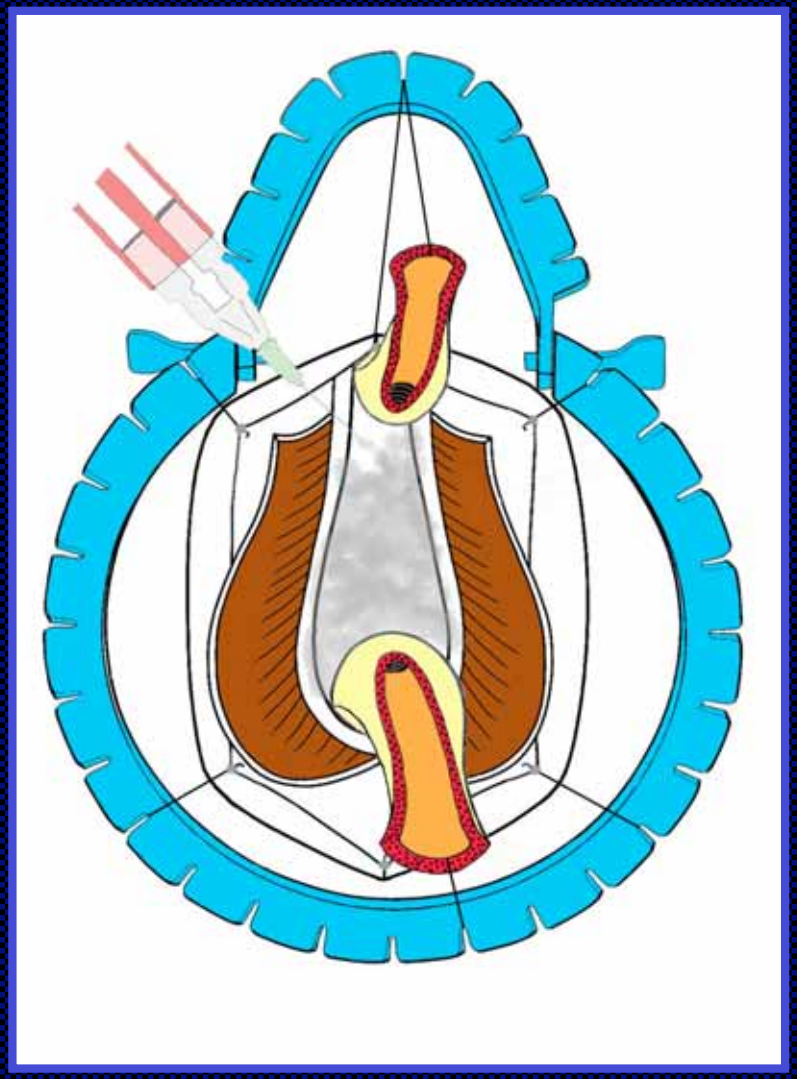


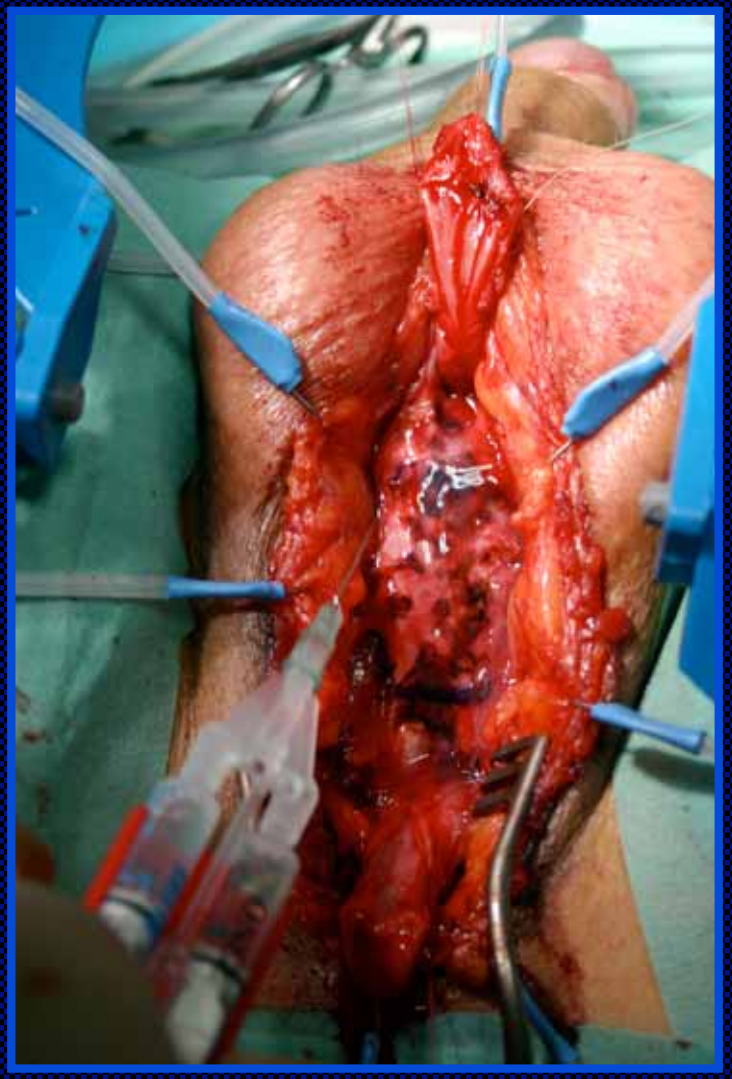
The distal and proximal urethral ends are mobilized from the corpora cavernosa



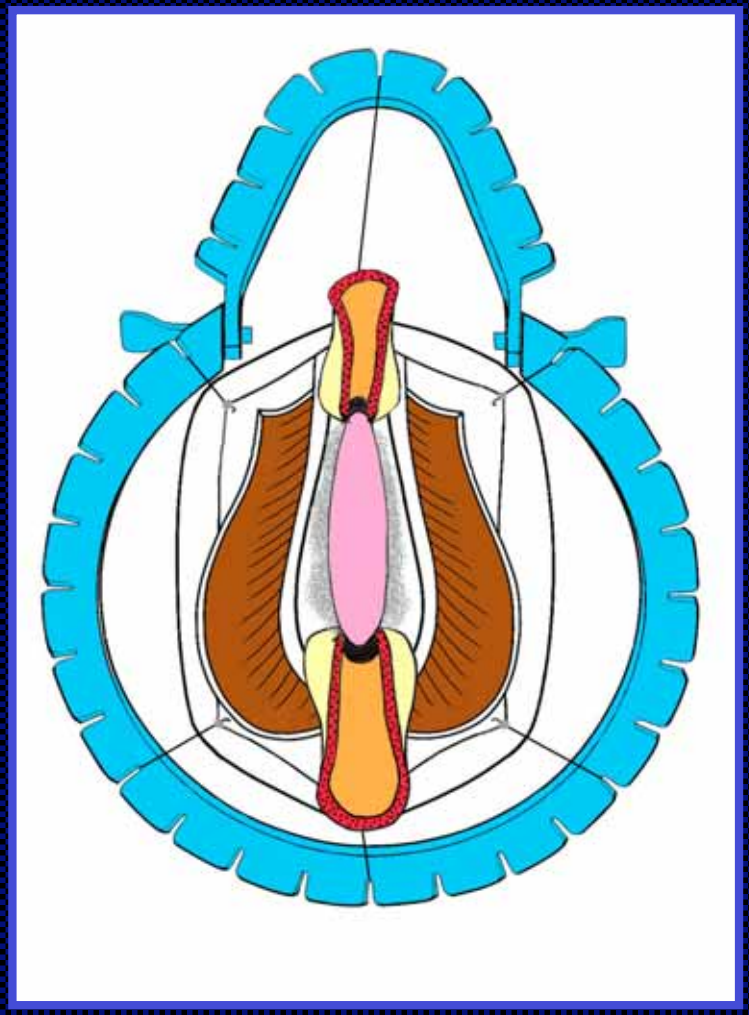


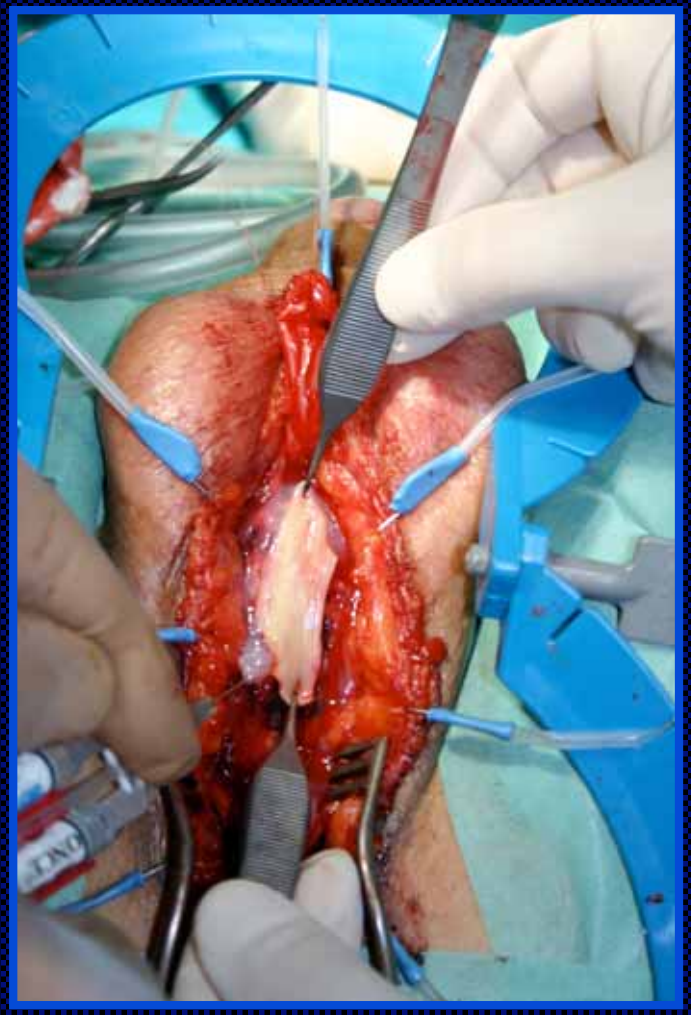
The distal and proximal urethral ends are fully spatuled along the dorsal surface



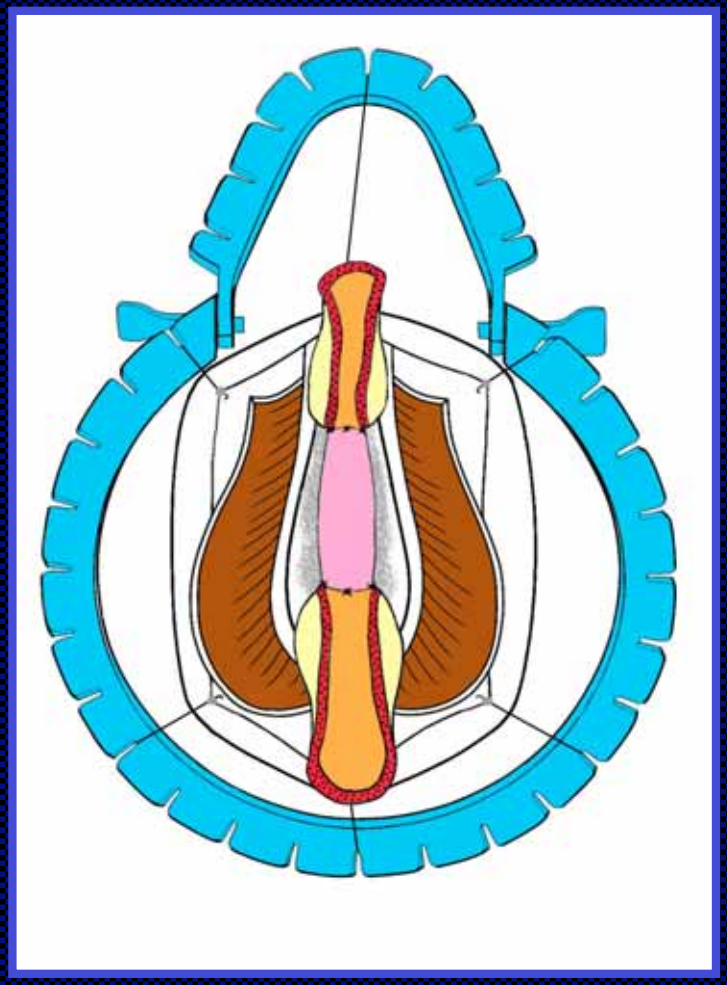


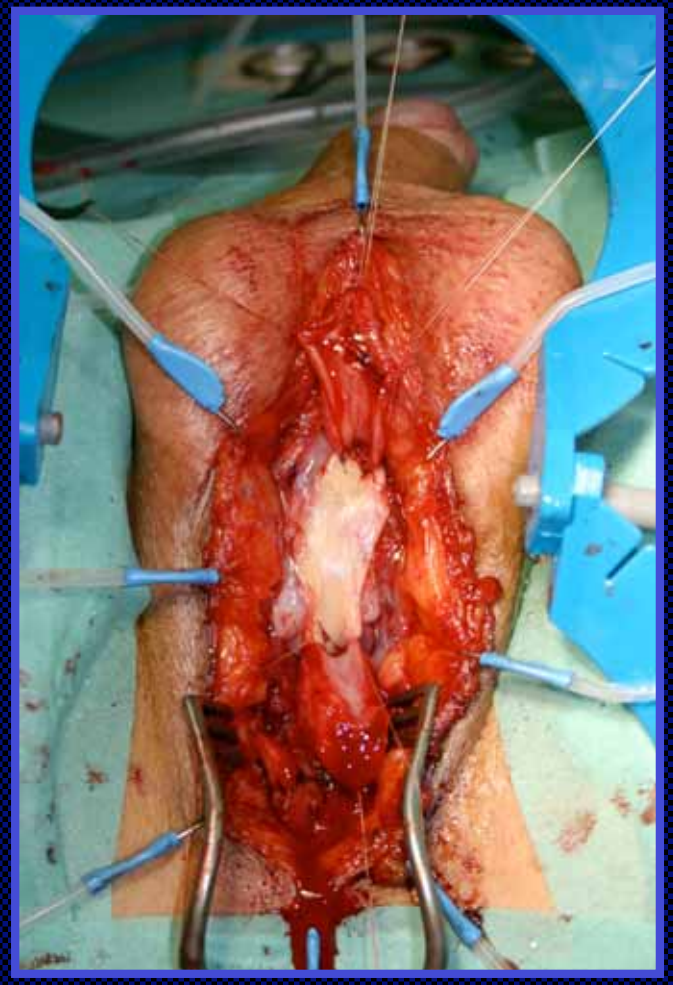
Two ml of fibrin glue are injected over the urethra



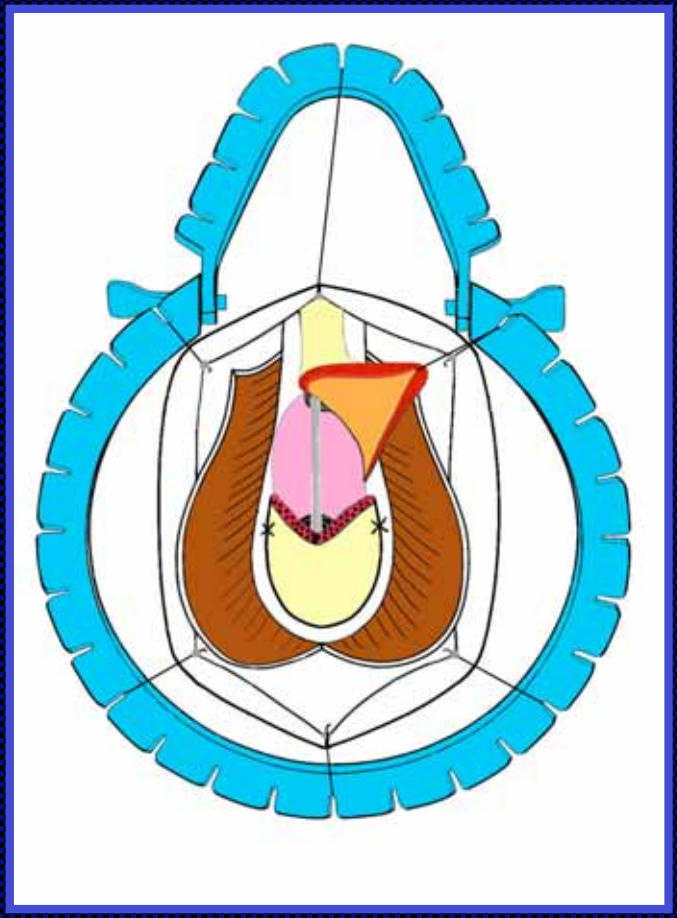


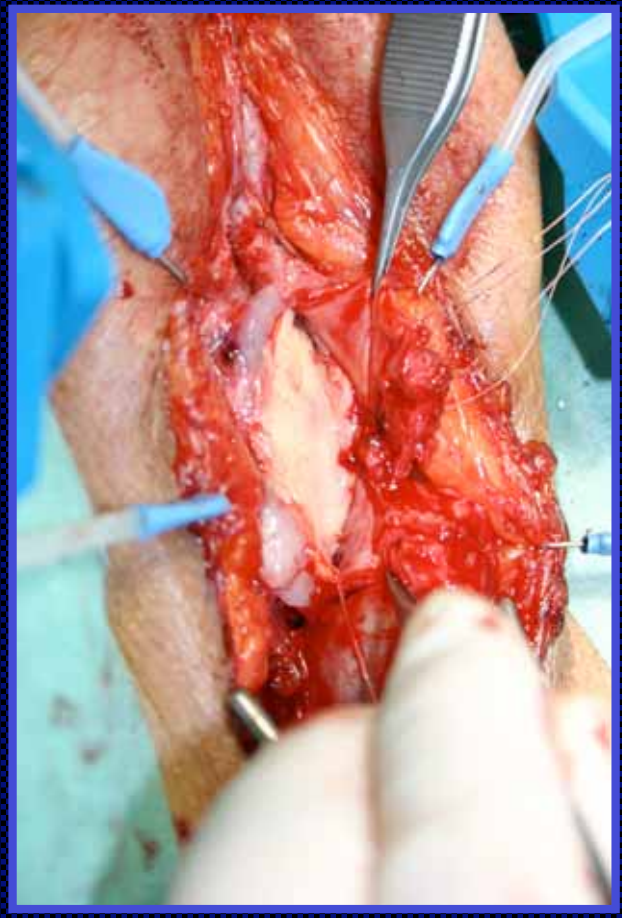
The buccal mucosal graft is applied over the fibrin glue



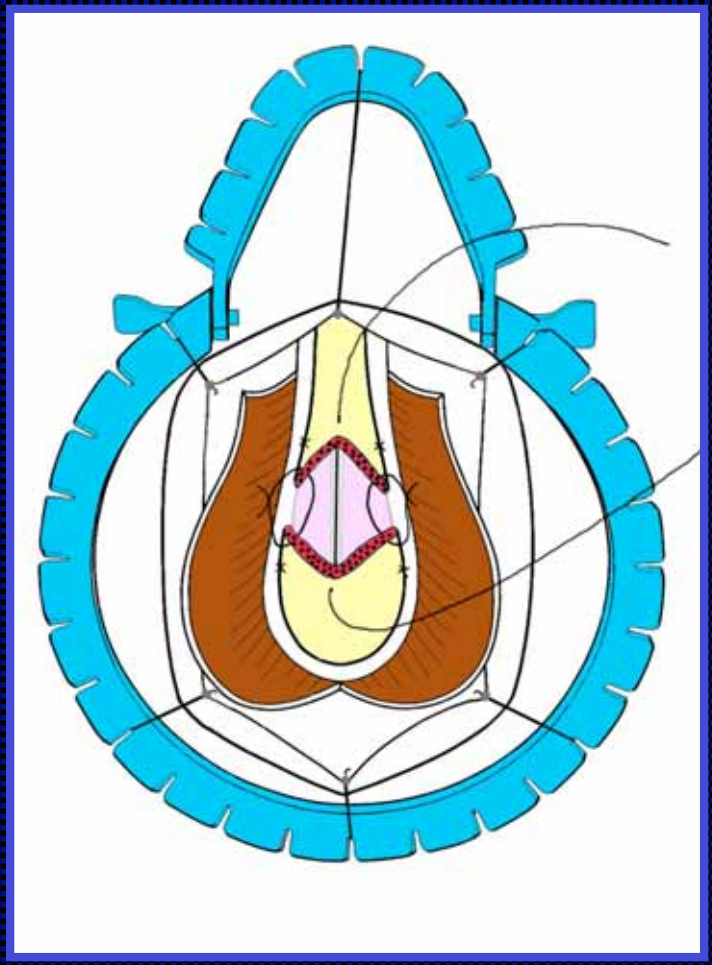


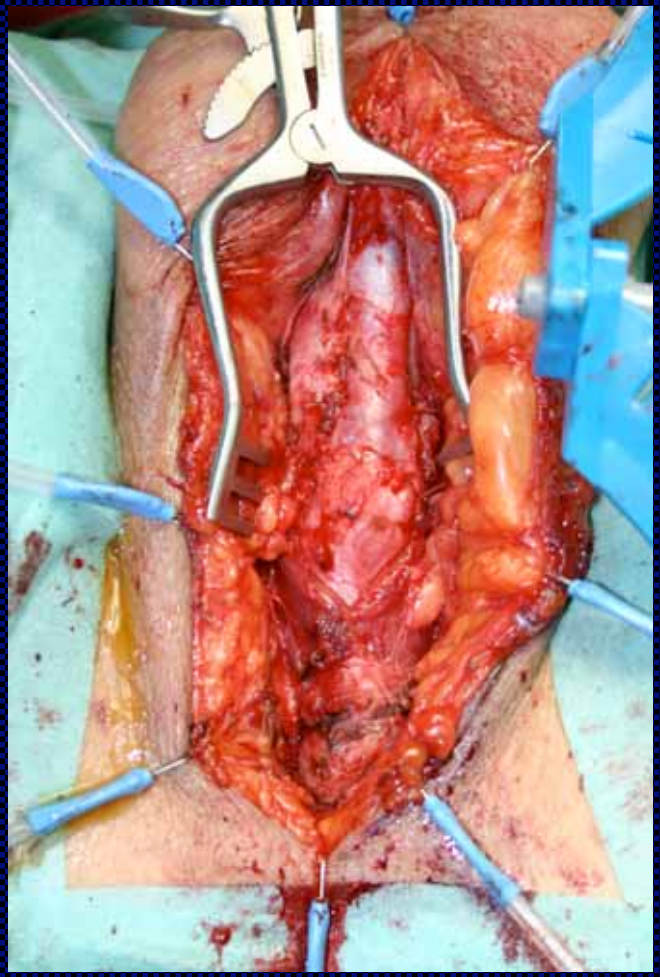
The distal and proximal urethral edges are sutured to the apices of the graft



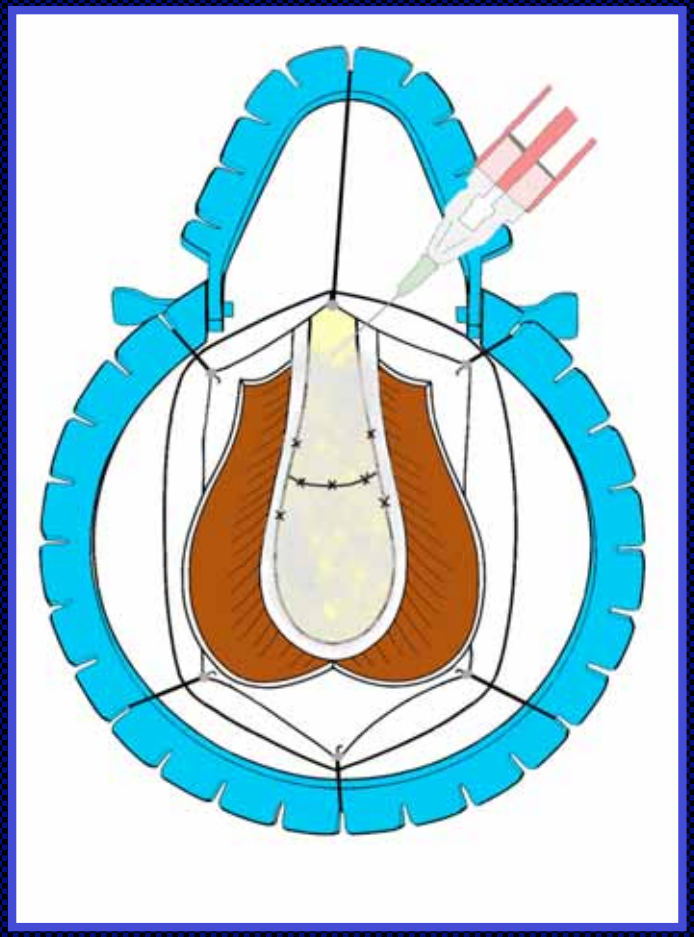


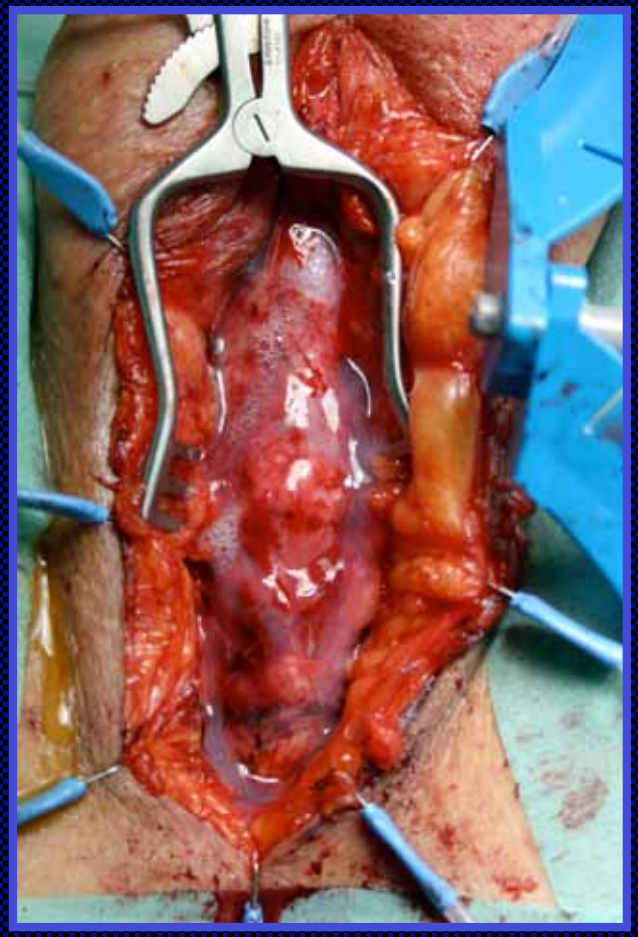
The distal urethra is pulled down and the proximal urethra is pulled up to cover the graft





The distal and proximal urethral edges are sutured together along the midline as an end-to-end anastomosis

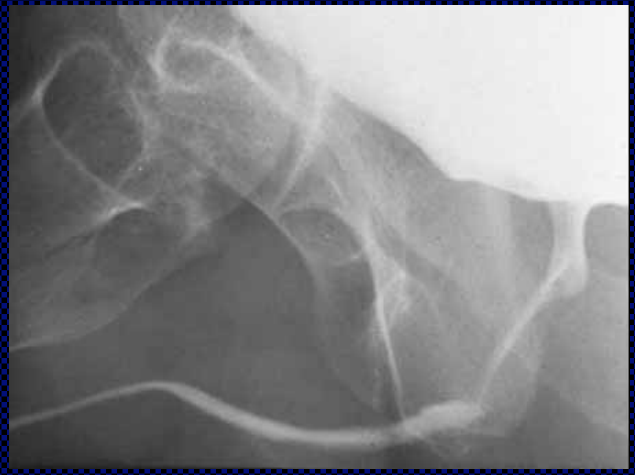




Two ml of fibrin glue are injected over the urethra to prevent urinary leakage

Post-operative care

- Patient is discharged from the hospital three days after surgery
- Patient is maintained on oral antibiotics until the catheter is removed
- Two weeks following surgery, the catheter is removed and voiding cysto-urethrography is obtained



Post-operative complications

- Urethrorrhagia due to nocturnal erections
- Temporary numbness or dysesthesia to the perineum
- Scrotal swelling
- Urethral fistula

Augmented roof-strip anastomosis

authors	patients	mean follow-up	success rate
Guralnick et al. 2001	29	28	93%
Peterson et al. 2003	53	58.8	86.8%
Barbagli et al. 2006	12	40	84%
Abouassaly et al. 2006	69	34	91%

Madonna del Parto - Piero della Francesca

Monterchi - Arezzo