

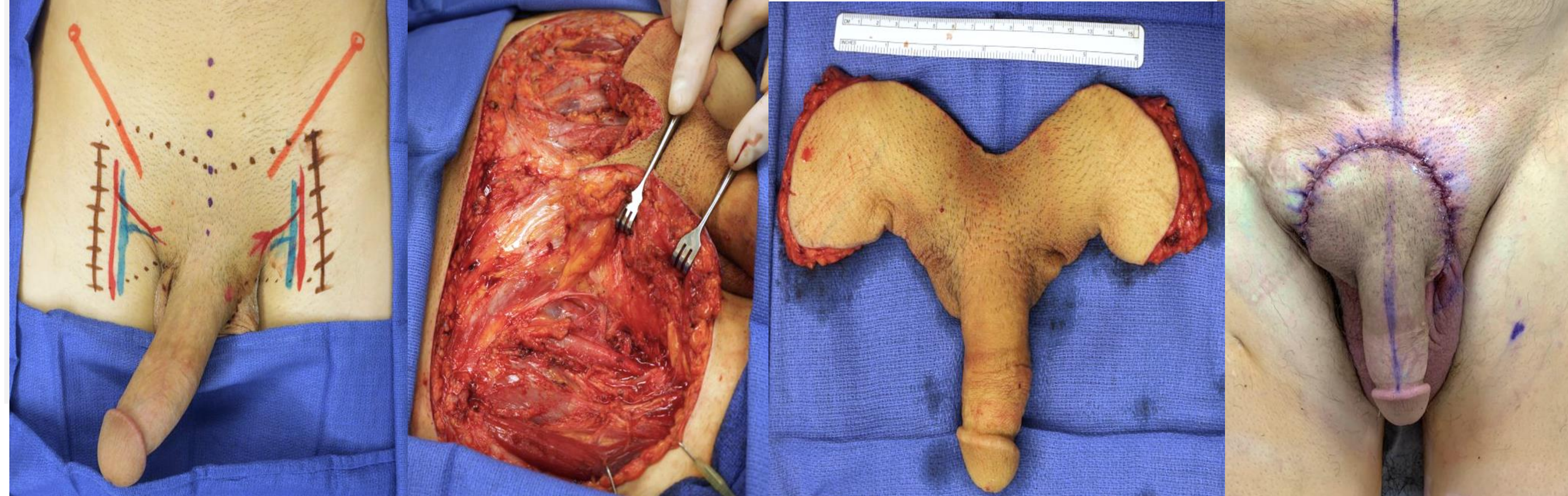
The First U.S. Penis Transplant: 9-Year Follow-Up

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INTRODUCTION

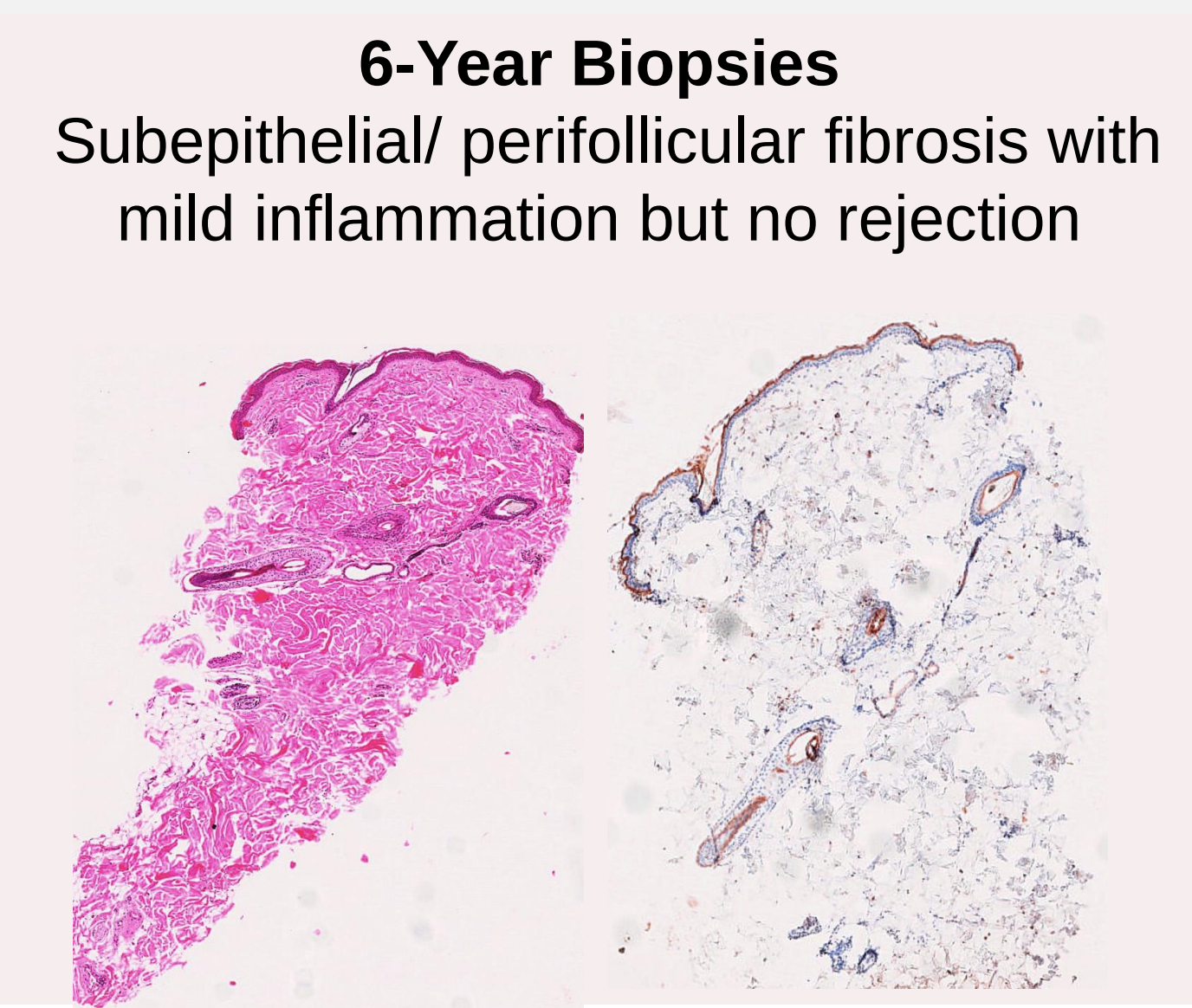
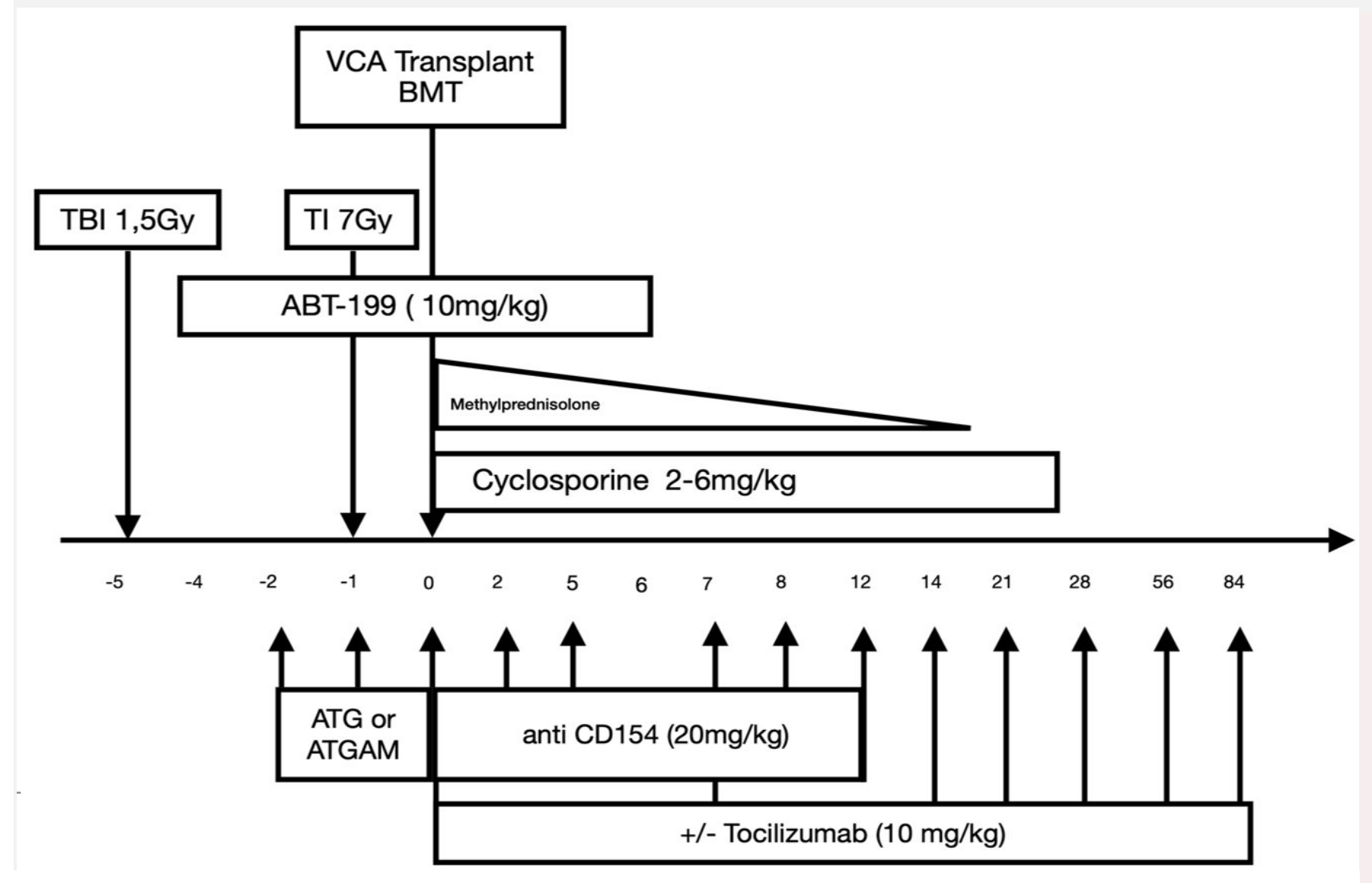
Penis transplantation evolved from advances in organ and vascularized composite allotransplantation, offering patients the potential to restore urinary/sexual function. Only 5 transplants have been performed globally, with only 3 recipients retaining their grafts. **To help establish best practices, we discuss the 9-year long-term outcomes of the first U.S. case.** A 62-year-old male underwent penis tranplant following oncologic subtotal penectomy. The cavernosal arteries, deep dorsal vein and the bilateral dorsal nerves (2cm nerve graft) were reconstructed. Return OR two times.



RESULTS

1. Immunologic Outcomes

- Induction: rabbit anti-thymocytes globulin
- Maintenance: tacrolimus, mycophenolate, prednisone
- 2 brief acute rejections: anti-thymocytes globulin, prednisone
- 1 cellular rejection: sirolimus (discontinued)
- Stable immunologic status thereafter



METHOD

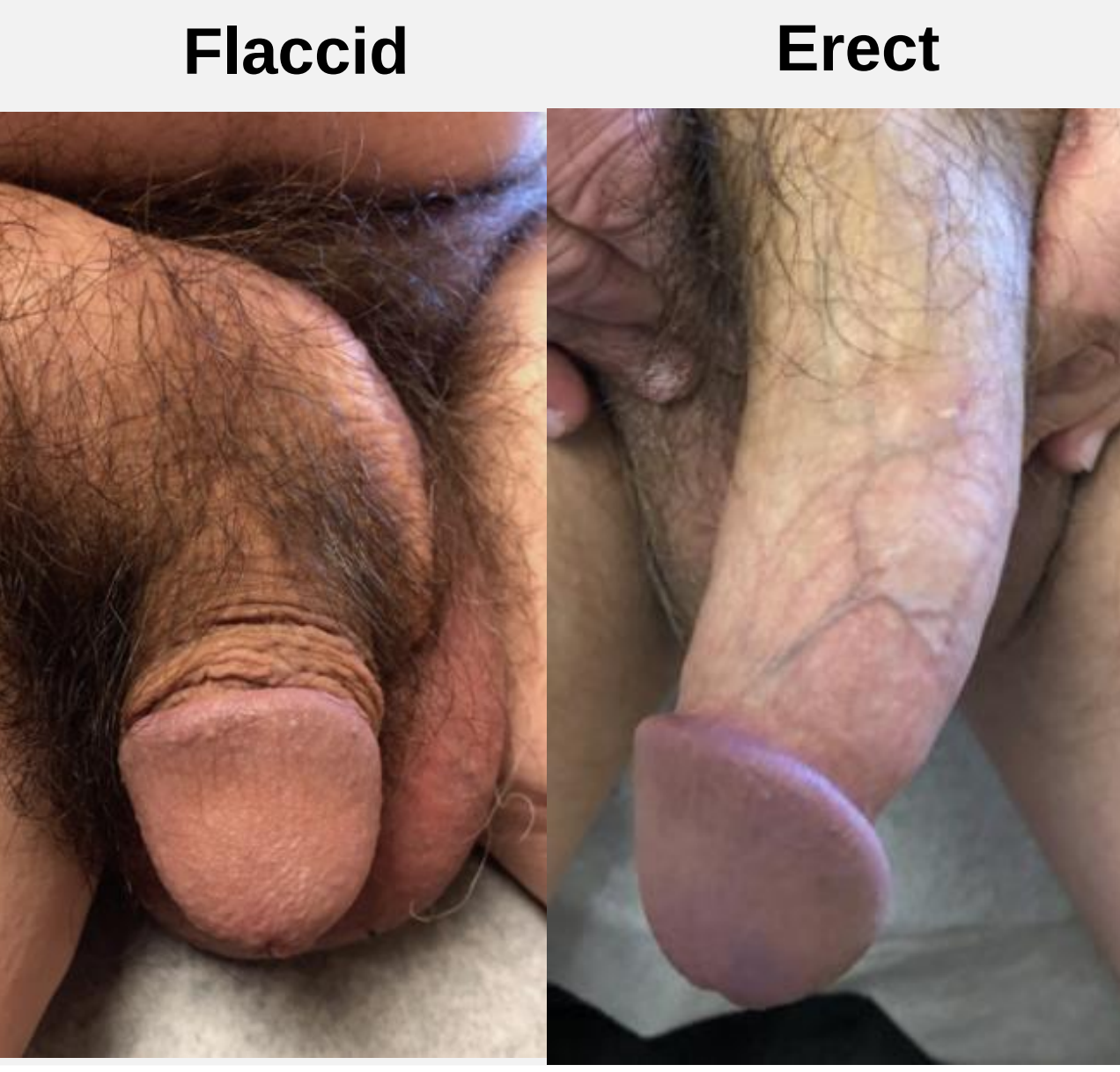
1. **Immunologic Outcomes:** immunosuppression regimen, course, biopsies
2. **Erection:** combination stimulation, rigidity, Sexual Health Inventory for Men Questionnaire (SHIM) score, doppler
3. **Urinary Function:** flexible cystoscopy, uroflowmetry, post-void US
4. **Sensory Function:** quantitative testing, patient-reported sensation
5. **Aesthetic:** photography, patient-reported

2. Erection Function

Combination of intraurethral Trimix, Tadalafil & audio/ visual stimulation (AVS) resulted in the most significant improvement of erection:

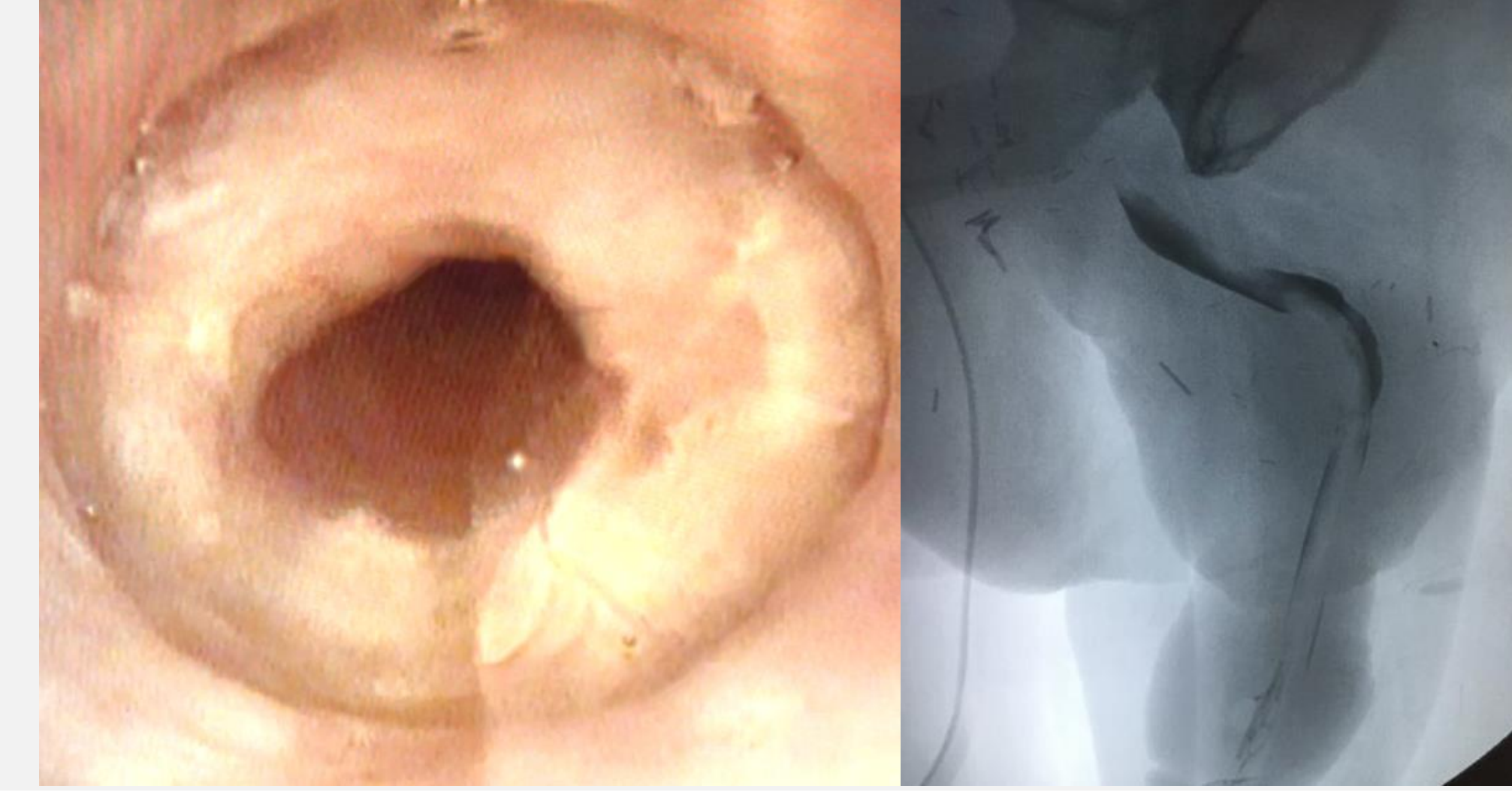
- 60% rigidity increase
- SHIM score: 20 (mild dysfunction)
- Doppler: mild arterial insufficiency, inhibition of venous leak
- Sufficient for penetration

Table 1. Erectile Functional Based on Method of Stimulation					
Visit #	Method of Stimulation (Alprostadil/ Papaverine/ Phentolamine)	Erection Response, Rigidity (1-100%)	Right Cavernosal Velocities – PS (cm/s)/ED (cm/s)	Left Cavernosal Velocities – PS (cm/s)/ED (cm/s)	SHIM Score, Method of stimulation used at home (Alprostadil/ Papaverine/ Phentolamine)
1	AVS alone	10	N/A	N/A	8, daily Tadalafil
2	250/7.5/1 Trimix IUG with AVS	40	22.65/11.01	16.99/8.49	8, daily Tadalafil
3	1000/7.5/1 Trimix IUG with AVS	50-60	20.45/5.6	21.0/3.7	20, daily Tadalafil and 500/7.5/1 or 750/7.5/1 Trimix IUG



3. Urinary Function

- Urethra: no urinary anastomotic strictures or irregularities between native & allograft mucosa
- Flow: peak velocity 14.7mL/sec (mild↓)
- Voiding: asymptomatic, no evidence of obstruction
- Post-void US: 0



4. Sensory Function

Quantitative testing at the shaft & glans:

- Preserved sensitivity to monofilament, vibration, pinprick
- Reduced temperature detection: cold > heat pain > warmth
- Absent 2-point discrimination

Table 2. Quantitative Sensory Testing				Table 3. Patient-Reported Outcomes	
Quantitative Test	Nerve Fiber Type	Number of Areas Detected (% of 6)	Detection Threshold, units (SD)	Are you able to feel light touch on your penis?	3/5
Monofilament (Mechanical Detection Threshold)	Large Myelinated Type Aβ	100%	Shaft: 2.83 (0.0) Glans: 2.83 (0.0)	Are you able to feel pressure on your penis?	3/5
Two-Point Discrimination	Large Myelinated Type Aβ	0%	Not Detected	Are you able to feel cold on your penis?	3/5
Vibration	Large Myelinated Type Aβ	100%	Shaft: 7.6 (0.1) Glans: 7.8 (0.0)	Are you able to feel warmth on your penis?	3/5
Pin Prick (Sharp Pain Detection)	Small Thinly Myelinated Type Aδ	100%	Shaft: 16.0 (0.0) Glans: 12 (5.7)	How much erogenous feeling do you have when your penis is touched sexually?	3/5
Cold Detection Threshold	Small Thinly Myelinated Type Aδ & Unmyelinated Type C	83.3%	Shaft: 14.3 °C (1.4) Glans: 14.9 °C (1.3)	Do you have any pain in your penis?	No
Warm Detection Threshold	Small Unmyelinated Type C	16.7%	Shaft: Not Detected Glans: 37 °C (0.0)	Do you have any hypersensitivity in your penis?	No
Heat Pain Detection Threshold	Small Unmyelinated Type C & Thinly Myelinated Type Aδ	33.3%	Shaft: 47.0 °C (0.0) Glans: 42 °C (0.0)	How satisfied are you with overall sensation of your penis?	5/6

5. Aesthetic Outcomes

Overall
“very satisfied”



CONCLUSION

These promising long-term immunologic, erectile, urinary, sensory, aesthetic outcomes encourage the broader adoption of penis transplantation, offering new hope for patients with traumatic and/or oncologic genitourinay loss, including wounded warriors.