

Human Papillomavirus of the Glans-Foreskin Transition in a Young Man: Surgical Excision and Functional Reconstruction

Sara Silva, MD^{1*}, Manuel Vieira, MD²

¹Department of Plastic and Reconstructive Surgery, Hospital da Luz Setúbal, Setúbal, Portugal.

²Department of Plastic and Reconstructive Surgery, Hospital da Luz Setúbal, Setúbal, Portugal.

*Corresponding Author: Sara Silva, MD, Department of Plastic and Reconstructive Surgery, Hospital da Luz Setúbal, Setúbal, Portugal.

ABSTRACT

Background: Human papillomavirus (HPV) is the most prevalent sexually transmitted infection worldwide. Although it is often presented as minor lesions, extensive involvement of the glans-foreskin transition can pose significant aesthetic and functional challenges that conventional treatments may fail to address.

Case Report: A 30-year-old man in good health presented with a symptomatic verrucous lesion measuring 3 cm at the glans-foreskin junction. The lesion had grown over a period of six months. A biopsy confirmed HPV without malignancy. The patient underwent wide surgical excision with oncological margins, followed by immediate reconstruction using a dermoadipose graft harvested from the inner arm.

Results: At the six-month follow-up, excellent graft integration was observed, with no necrosis, retraction or infection present. The patient reported high aesthetic satisfaction and partial sensory recovery, as well as fully preserved erectile function with no recurrence.

Conclusion: Compared to conventional skin grafts, the use of dermoadipose grafts rich in adipose-derived stem cells (ADSCs) provides superior elasticity and biomechanical adaptation, making them an effective solution for complex genital reconstructions.

Keywords: HPV, Genital Reconstruction, Dermoadipose Graft, ADSCs, Penile Surgery..

ARTICLE INFORMATION

Received: 10 May 2026

Accepted: 23 May 2026

Published: 25 May 2026

Cite this article as:

Sara Silva, MD, Manuel Vieira, MD. Human Papillomavirus of the Glans-Foreskin Transition in a Young Man: Surgical Excision and Functional Reconstruction. Open Journal of Medical Images and Case Reports. 2026;3(1): 06-10.

<https://doi.org/10.71123/3067-1078.030102>

Copyright:©2026. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection (STI) worldwide. Genital lesions caused by HPV can range from benign warts to malignant tumours (1). When located at the transition between the glans and the foreskin, the high requirement for skin elasticity and sensitivity makes them a specific surgical challenge. Although conservative treatments exist, extensive or symptomatic lesions require specialized surgical and reconstructive approaches to ensure definitive treatment.

Case Presentation

A healthy 30-year-old male presented with a 3 cm verrucous lesion at the glans-foreskin junction. The lesion had grown progressively over six months and was causing symptoms. Although the initial biopsy showed no malignancy, the extent of the lesion required definitive surgical intervention to preserve function and aesthetics.

Surgical Technique

Given the extensive nature of the lesion, traditional treatment modalities were deemed insufficient to achieve a

successful outcome. The primary surgical objective was to ensure complete oncological clearance while meticulously preserving erectile function and aesthetic integrity. To this end, the surgical team performed a wide excision with rigorous oncological safety margins.

A critical step in the procedure involved the induction of an artificial intraoperative erection. This allowed the surgeons to precisely assess the dimensions of the defect during tumescence and ensured that the subsequent reconstruction would accommodate the mechanical demands of the penis. The resulting defect was reconstructed using a dermoadipose graft harvested from the medial aspect of the arm, chosen for its optimal tissue characteristics and discreet donor site morbidity (2).

To ensure maximal graft-to-bed contact and promote early revascularisation, the graft was secured using a tie-over bolster dressing. This compression dressing remained undisturbed for one week to provide a stable environment for initial integration. Upon removal of the tie-over dressing on the seventh post-operative day, the graft demonstrated excellent viability and seamless integration into the recipient site, with no evidence of early complications.

Discussion

When selecting a substrate for penile reconstruction, surgeons must balance the need for vascular reliability with the biomechanical requirements of the organ. While techniques such as the Bracka repair (3) have traditionally utilized buccal mucosa or skin grafts, the introduction of dermoadipose tissue offers a multi-dimensional advantage.

The clinical utility of dermoadipose grafts is most apparent when compared to the standards used in complex urological reconstructions. In hypospadias surgery, particularly in staged redo-repairs, the primary challenge is the “hostile” recipient bed. Studies on ADSCs (4,5) suggest that these cells do not merely act as a physical bridge but as a biological engine, secreting cytokines that favour regenerative healing over scarring (6).

Similarly, for Peyronie’s Disease, the biomechanical profile of the graft is the deciding factor for success. While Hatzichristodoulou et al. (7) have reviewed various grafting materials, the dermoadipose graft stands out for its unique ability to provide both structural integrity and elasticity. By suppressing pro-fibrotic factors like TGF- β 1, the adipose component ensures that the repair remains pliable during the expansion phases of erection (8).

Dermoadipose grafts offer distinct biological and functional advantages over traditional techniques, primarily due to the presence of Adipose-Derived Stem Cells (ADSCs) within the graft tissue (9). These cells facilitate a superior healing environment by promoting the differentiation of fibroblasts, keratinocytes, and endothelial cells, which are essential for structural regeneration. Furthermore, ADSCs secrete vital growth factors, such as Vascular Endothelial Growth Factor (VEGF) and basic Fibroblast Growth Factor (bFGF), which stimulate robust neovascularisation and provide local immunomodulation by reducing inflammation at the graft site (6,8).

Beyond these cellular benefits, the dermoadipose architecture provides critical biomechanical advantages in genital reconstruction. The inherent elasticity of the adipose layer is crucial for accommodating the physiological expansion required during erections, ensuring the tissue remains pliable under mechanical stress (10). When compared to thin skin grafts, this approach significantly reduces the risk of cicatricial retraction, thereby preventing long-term structural distortion (11). Additionally, the graft supports enhanced sensory recovery, offering a higher potential for reinnervation and the subsequent restoration of local sensitivity.

Outcomes

The patient’s clinical trajectory was highly favorable, with a formal six-month post-operative assessment confirming exceptional structural and functional outcomes. The dermoadipose graft demonstrated seamless integration with the recipient bed, devoid of ischemic necrosis,



Figure 1. Preoperative presentation. Clinical view of a 3 cm verrucous lesion at the glans-foreskin junction, showing signs of progressive growth over six months.

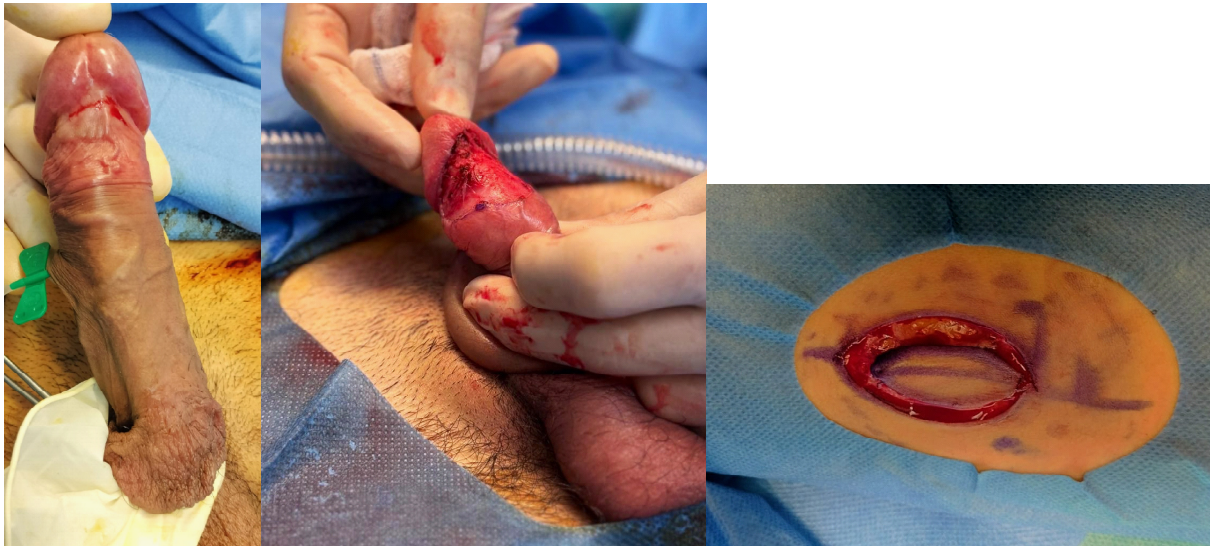


Figure 2. *Surgical planning and donor site. (A) Preoperative marking of oncological safety margins. (B) Intraoperative view of the dermoadipose graft harvested from the medial arm region.*



Figure 3. *Immediate reconstruction. Intraoperative result showing the integration of the dermoadipose graft into the surgical defect at the glans-foreskin transition.*



Figure 4. *Six-month postoperative follow-up. Final aesthetic and functional result. Note the absence of tissue retraction, preserved erectile function, and excellent integration of the graft.*

infection, or significant cicatricial retraction. Crucially, erectile capacity was fully preserved, and the patient reported a gradual recovery of partial local sensitivity, a finding that suggests effective reinnervation facilitated by the adipose scaffold. Subjective evaluations underscored a high degree of both functional and aesthetic satisfaction, with no evidence of primary lesion recurrence observed to date.

These results highlight the clinical superiority of dermoadipose grafts over conventional skin-only techniques for complex genital reconstruction (2). This success is largely attributable to the graft's inherent mechanical pliability, which allows for a more natural adaptation to the physiological stresses of penile erection. Unlike traditional thin skin grafts, which are often compromised by slow plasmatic imbibition and a pronounced tendency for contracture, the dermoadipose graft benefits from high elasticity and accelerated, ADSC-mediated vascularization (4). Furthermore, while buccal mucosa remains a stalwart choice for urethral lining, it cannot match the tissue bulk and immunomodulatory properties provided by the dermoadipose graft.

By serving as a biological buffer, the dermoadipose component effectively mitigates the risk of secondary contraction, a common sequela in conventional grafting that frequently manifests as chordee or dyspareunia. Ultimately, the strategy of immediate reconstruction proved pivotal: it not only curtailed the risk of opportunistic infection but also proactively safeguarded against the dense scar retractions that can otherwise severely impair long-term sexual function and the patient's holistic quality of life.

Conclusion

The combination of wide oncological excision and immediate reconstruction using dermoadipose grafts represents a safe and highly effective surgical strategy for the management of complex genital HPV lesions. By leveraging the unique regenerative properties of ADSCs, this technique significantly enhances tissue integration and functional outcomes. This makes it an ideal approach for preserving both sexual function and aesthetic integrity, considerations of paramount importance in younger patient populations.

Ultimately, this case reinforces the necessity of an individualized, multidisciplinary approach when addressing extensive genital pathology. The integration of dermoadipose grafting into the reconstructive armamentarium allows surgeons to achieve superior patient satisfaction with remarkably low complication rates. By harnessing the biological potential of ADSCs, we can offer a restorative solution that overcomes the limitations

of traditional grafting, ensuring long-term anatomical stability and a higher quality of life for the patient.

Declarations

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript. No financial support or benefits have been received from any commercial source that could inappropriately influence the content of this work.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Informed Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

1. Patra, S., Shand, H., Ghosal, S., & Ghorai, S. (2025). HPV and male cancer: Pathogenesis, prevention and impact. *Journal of the Oman Medical Association*, 2(1), 4. <https://doi.org/10.3390/joma2010004>
2. Inchingolo, F., Tatullo, M., Pacifici, A., Gargari, M., Inchingolo, A. D., Inchingolo, A. M., Dipalma, G., Marrelli, M., Abenavoli, F. M., & Pacifici, L. (2012). Use of dermal-fat grafts in the post-oncological reconstructive surgery of atrophies in the zygomatic region: clinical evaluations in the patients undergone to previous radiation therapy. *Head & face medicine*, 8, 33. <https://doi.org/10.1186/1746-160X-8-33>
3. Bracka, A. (1995). A long-term view of hypospadias. *British Journal of Plastic Surgery*, 48(6), 345–355. DOI: 10.1016/S0007-1226(95)90023-3
4. Castiglione, F., Dewulf, K., Hakim, L., Weyne, E., Montorsi, F., Russo, A., Boeri, L., Bivalacqua, T. J., De Ridder, D., Joniau, S., Albersen, M., & Hedlund, P. (2016). Adipose-derived Stem Cells Counteract Urethral Stricture Formation in Rats. *European urology*, 70(6), 1032–1041. <https://doi.org/10.1016/j.eururo.2016.04.022>
5. Zuk, P. A., Zhu, M., Ashjian, P., De Ugarte, D. A., Huang, J. I., Mizuno, H., ... & Hedrick, M. H. (2002). Human adipose tissue is a source of multipotent stem cells. *Molecular Biology of the Cell*, 13(12), 4279–4295. <https://doi.org/10.1091/mbc.e02-02-0105>
6. Kimura, Y., Ozeki, M., Inamoto, T., & Tabata, Y. (2014). Adipose-derived stem cells for regenerative medicine. *Current Stem Cell Research & Therapy*, 9(2), 112–121.

[https://doi.org/10.1016/S0142-9612\(03\)00049-8](https://doi.org/10.1016/S0142-9612(03)00049-8)

7. Hatzichristodoulou, G., Osmonov, D., Kübler, H., Hellstrom, W. J., & Yafi, F. A. (2016). Contemporary review of grafting techniques for the surgical treatment of Peyronie's disease. *The Journal of Sexual Medicine*, *13*(4), 544–552. DOI: 10.21037/tau.2016.03.16
8. Gir, P., Oni, G., Brown, S. A., Rose, V., & Kenkel, J. M. (2012). Human adipose stem cells: Current clinical applications. *Plastic and Reconstructive Surgery*, *129*(6), 1277–1290. DOI: 10.1097/PRS.0b013e31824ecae6
9. Kaufman, M. R., Miller, T. A., Huang, J. I., Roostaieian, J., Wasson, K. L., Ashley, R. K., & Bradley, J. P. (2007). Autologous fat transfer for facial recontouring: Is there a role for adipose-derived stem cells? *Plastic and Reconstructive Surgery*, *119*(1), 323–331. DOI: 10.1097/01.prs.0000260712.44089.e7
10. Monstrey, S., Hoebeke, P., Dhont, M., De Cuypere, G., Rubens, R., Moerman, M., & Hamdi, M. (2005). Surgical techniques in phalloplasty with a frailty to the radial forearm flap. *British Journal of Plastic Surgery*, *58*(2), 137–148. DOI:10.1007/s00238-005-0743-1
11. Largo, R. D., Tchang, L. A., Mele, V., Scherberich, A., Harder, Y., Wettstein, R., ... & Schuurman, J. P. (2014). Efficacy, safety and complications of autologous fat grafting to healthy breast tissue: A systematic review. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *67*(4), 437–448. <https://doi.org/10.1016/j.bjps.2013.11.011>