

Oral Mucosa Graft Glanuloplasty—Ten Years in Retrospect

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Abstract

Penile glans amputation is a tragic complication of circumcision. Beyond the psychological trauma parents go through, they have to deal with the lower urinary tract symptoms including acute urine retention their baby boys suffer due to meatal stenosis from the scarring process that ensues. We report on the cosmetic and functional outcomes in two patients ten years after neo-glans reconstruction following total glans amputation as a complication of circumcision and discuss the lessons learned over the period.

Keywords

Penile Glans Amputation, Circumcision Complication, Neo-Glans Reconstruction, Meatal Stenosis, Urinary Tract Symptoms

1. Introduction

Penile amputation is an uncommon injury resulting from self-mutilation, accidental trauma or felonious assault [1]. In the pediatric age group, circumcision is the most common cause of penile amputation [2]. In 2014, we reported on the technique of neo-glans reconstruction in a patient with an amputated glans penis following guillotine neonatal circumcision [3]. The initial problems were complete meatal occlusion with scarring and an unsightly penile stump (**Figure 1(a)**). We operated and achieved a patent urethra to allow for free passage of urine and a cosmetically acceptable neo-glans penis utilizing the Venkov and Slavov method of glanular reconstruction [2]. Six months after this patient presented, we performed the same procedure on another patient who presented similarly with an amputated glans penis following plastibel circumcision (**Figure 1(b)**).



(a)



(b)

Figure 1. (a) Complete meatal stenosis in a 3-year boy following glans penile amputation from guillotine circumcision; (b) Complete meatal occlusion in a 5-month-old boy following glans amputation from Plastibel circumcision.

These two patients have been followed up over the period and we present the cosmetic and functional outcomes ten years post-surgery. Questions about the durability of the functional and cosmetic outcomes of such a novel procedure in the long term have necessitated this update.

2. Case Description

2.1. Case 1

A 3-year-old boy was brought to the urology clinic with complaints of straining

at urination, poor stream and crying anytime he passed urine. He had guillotine circumcision during the neonatal period by a local circumciser popularly referred to here as “wansam”.

In recent times, his symptoms had worsened prompting the parents to bring him to the hospital.

On examination, he had adequate growth for age. There was a non-tender bladder bulge. The penis looked small for age; the glans penis was absent with a pin-hole neo-meatus.

An impression of chronic urine retention 2° meatal stenosis from penile glans amputation following circumcision was made. A suprapubic catheter was passed to relieve the lower urinary tract obstruction and neo-glans reconstruction using buccal mucosa graft performed subsequently.

2.2. Case 2

A five-month-old baby boy was brought to the urology clinic three months after undergoing Plastibel circumcision with worsening lower urinary tract symptoms. Parents noticed a darkening and subsequent sloughing off of the glans penis following the circumcision but were reassured by the midwife who performed the circumcision that, what they saw as glans penis was indeed the foreskin.

On examination, the glans penis was absent with complete scarring of the penile stump with absent meatus. This was our second case of glans penis amputation following circumcision in six months.

A suprapubic cystostomy was performed to relieve the obstruction and subsequent neo glans reconstruction was performed.

3. Methods

The Neoglans Reconstruction Technique

We utilized the Venkov and Slavov method of glanular reconstruction [2] as was described in our report of the first case published 10 years ago [1]. A 4 cm long and 2 cm wide lower lip oral mucosa graft was harvested and used to graft the distal 2 cm of the corporal bodies after 2 cm of the distal penile skin had been excised. One edge of the oral mucosa graft was anastomosed to the urethral margin distally and the other proximally to the skin. At the time of publication of the first case, we had followed him up for 6 months with satisfactory cosmetic and functional outcomes in terms of passage of urine.

The parents were counselled on the children’s condition and informed consent was obtained after explaining the intended surgical procedure and outcomes to them. The surgeries were done under general anesthesia and patients received a five-day course of intravenous Cefuroxime antibiotic. Dressings were changed on alternate days until the wound healed and the urethral catheter was removed on post-operative day 10. Then both patients were followed up with monthly visits to the consulting room for three months to assess cosmetic and functional outcomes and then once yearly afterward. There was no need for any

interventions in the postoperative period for both patients as no complications were recorded.

4. Discussion

We have followed-up on these two patients and ten years on, we are pleased to report that the neo-urethral meatus has remained patent, the neo-glans penis has taken on the shape of an arrowhead like a normal glans penis in one of them (**Figure 2(b)**) and the parents are satisfied with the cosmetic outcomes. Both patients have witnessed an appreciable increase in penile length and size. The oral mucosa graft has adapted quite well to the dry external environment and the expected desquamation or scaling is insignificant (**Figure 2(a)**) & (**Figure 2(b)**).



(a)



(b)

Figure 2. (a) Same boy now at 12 years ten years after oral mucosa graft glanuloplasty; (b) Same patient with patent urethra and arrowhead neo-glans penis ten years after oral mucosa graft glanuloplasty.

At present, what remains to be resolved is the test of sensitivity of the neo-glans penis during intercourse and the final penile length after the adolescent growth spurt. We hope to follow these patients up into their adulthood to record these changes as well as the psychological impact of the injury on their sexual life.

In this report, we reiterate the essential operative factors that contributed to the success of the procedure.

Although Humby first described the use of buccal mucosa for urethral substitution in 1941, it was not until the early 1990s that this technique was rediscovered for this purpose [4] [5].

The success of using buccal mucosa for neo-glans reconstruction and as a substitute for the urethra can be attributed to several factors. These include easy accessibility and handling, resistance to infection, compatibility with wet and dry environments, thick epithelium, and a thin lamina propria, allowing for early inosculation [6] [7].

In addition, various intraoperative factors also play a crucial role in achieving a successful outcome. These include complete excision of scarred tissue, spatulation of the urethral meatus to reduce the risk of stenosis, and gentle tissue handling. There have been reported cases of contractures with the use of buccal mucosa graft for neoglans reconstruction but as our results show, our patients did not develop contractures and we believe that the rate of contracture formation can be minimized with strict adherence to the success factors we adopted [8].

There are many techniques for neoglans reconstruction after complete or near-complete amputation.

Belinky *et al.* used the distal urethra to cover the corpus cavernosal tissue, but this requires a healthy urethra and a long penile stump for an acceptable sexual and cosmetic result [9]. Mazza and Cheliz also developed a two-stage technique in which a scrotal fasciocutaneous flap is tubularized and sutured to the distal end of the penis. The flap pedicle is then resected under local anesthesia after six weeks. This method provides good cosmesis but at the expense of a two-stage operation and a high rate of meatal stenosis [10].

Another technique is that described by Shaeer and Sebaie which is simple to perform, is a one stage procedure using a rectus abdominis myofascial flap, provides acceptable cosmetic and functional results [11]. However, some have reported complications of urethrocutaneous fistulae and meatal stenosis with this technique [12].

The need to train circumcision practitioners to avoid such tragic loss of the glans penis cannot be overemphasized and we have embarked upon extensive training over the last ten years which has reduced such unfortunate incidents in our country [13].

5. Conclusions

Glanuloplasty using the oral mucosa graft remains a viable technique for resolv-

ing the problems of glans amputation following circumcision. It guarantees durable meatal patency and enhanced penile cosmesis. Additionally, it is simple to perform and can easily be done in resource-poor settings.

It is noteworthy that the penis continues to grow in length and size in the unfortunate event of glans amputation in children. However, what is not known is how the final penile length after the adolescent growth spurt will compare with their peers and the sensitivity of the neo-glans during intercourse. A long-term follow-up of these two cases is therefore recommended.

Data Availability

The data supporting the conclusions of the study are available and can be accessed by an email request to the corresponding author.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Venkov, G. and Slavov C. (2006) New method for Recovering of Defects on Glans Penis after Partial or Total Glansectomy with Transplantation of the Oral Mucosa. *Khirurgiia (Sofia)*, **2006**, 23-27.
- [2] Hakim, M.B.I., Budaya, T.N. and Daryanto, B. (2023) Iatrogenic Penile Amputation Due to Circumcision Clamp in an Eight-Year-Old Boy. *Jurnal Kedokteran Brawijaya*, **32**, 265-268. <https://doi.org/10.21776/ub.jkb.2023.032.04.12>
- [3] Appiah, K., Amoah, G., Azorliade, R., Gyasi-Sarpong, K., Aboah, K., Arthur, D, *et al.* (2014) Glanuloplasty with Oral Mucosa Graft following Total Glans Penis Amputation. *Case Reports in Urology*, **2014**, 671303. <https://doi.org/10.1155/2014/671303>
- [4] Meneghini, A., Cacciola, A., Cavarretta, L., Abatangelo, G., Ferrarrese, P. and Tasca, A. (2001) Bulbar Urethral Stricture Repair with Buccal Mucosa Graft Urethroplasty. *EUR*, **39**, 264-267. <https://doi.org/10.1159/000052450>
- [5] Pansadoro, V., Emiliozzi, P., Gaffi, M., Scarpone, P., DePaula, F. and Pizzo, M. (2003) Buccal Mucosa Urethroplasty in the Treatment of Bulbar Urethral Strictures. *Urology*, **61**, 1008-1010. [https://doi.org/10.1016/S0090-4295\(02\)02585-2](https://doi.org/10.1016/S0090-4295(02)02585-2)
- [6] Barbagli, G., Selli, C., Tosto, A. and Palminteri, E. (1996) Dorsal Free Graft Urethroplasty. *The Journal of Urology*, **155**, 123-126. [https://doi.org/10.1016/S0022-5347\(01\)66566-2](https://doi.org/10.1016/S0022-5347(01)66566-2)
- [7] Barbagli, G. and Lazzeri, M. (2007) Surgical Treatment of Anterior Urethral Stricture Diseases: Brief Overview. *International Brazilian Journal of Urology*, **33**, 461-469. <https://doi.org/10.1590/S1677-55382007000400002>
- [8] Palminteri, E., Berdondini, E., Lazzeri, M., Mirri, F. and Barbagli, G. (2007) Resurfacing and Reconstruction of the Glans Penis. *European Urology*, **52**, 893-900. <https://doi.org/10.1016/j.eururo.2007.01.047>
- [9] (2024) Glanuloplasty with Urethral Flap after Partial Penectomy. *Journal of Urology*. <https://www.auajournals.org/doi/full/10.1016/j.juro.2010.09.010>
- [10] Mazza, O.N. and Cheliz, G.M.J. (2001) Glanuloplasty with Scrotal Flap for Partial

Penectomy. *The Journal of Urology*, **166**, 887-889.

[https://doi.org/10.1016/S0022-5347\(05\)65857-0](https://doi.org/10.1016/S0022-5347(05)65857-0)

- [11] Shaeer, O., El-Sebaie, A., Sherif, A., El-Sadat, A. and Shaeer, A. (2024) Glans Reconfiguration for Management of Glanular Mutilation. *The Journal of Sexual Medicine*, **5**, 500-503. <https://academic.oup.com/jsm/article/5/2/500/6862300>
- [12] Nasr, R., Traboulsi, S.L., Abou Ghaida, R.R. and Bakhach, J. (2013) Iatrogenic Penile Glans Amputation: Major Novel Reconstructive Procedure. *Case Reports in Urology*, **2013**, e741980.
- [13] Maison, P.O.M., Yahaya, I., Appiah, K.A., Ekor, O.E., Apraku, C. and Egyir, E. (2023) Circumcision Practice among Trained Circumcisers in Ghana. *African Urology*, **3**, 35-38.