Chapter 5
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Glanuloplasty with Oral Mucosa Graft Following Total Glans Penis Amputation: An Overview

Kwaku Addai Arhin Appiah[1,2*], George Amoah[2], Patrick Opoku Manu Maison[3], Edwin M. T. Yenli[4], C. K. Gyasi-Sarpong[2,5], Roland Azorliade[2], Kwaku Otu-Boateng[2], Charles Kwame Adofo[6], J. B. Addae[2], Benjamin Frimpong-Twumasi[2], Isaac Opoku Antwi[2], Dominic Annor Mintah[2] and Richard Kofi Ametih[2]

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ABSTRACT

Glanuloplasty following amputation of the glans penis can be very daunting for the urologist. The management of penile glans amputation depends on the duration before presentation. In the acute phase, management usually involves auto-transplantation. The use of skin grafts, scrotal flaps and pedicled myocutaneous flaps have been described for penile glans reconstruction following amputation of the glans penis. However, these techniques are fraught with their own peculiar challenges.
This chapter is an overview of the management of penile glans amputation and a description of the technique of neo-glans reconstruction using oral mucosa graft.

Keywords: Neo-glans penis; Glans Amputation; circumcision; Glanuloplasty; Oral Mucosa.

1. INTRODUCTION

Amputation of the glans penis may be accidental or intentional, partial or complete [1]. Accidental amputation of the glans penis is a rare but tragic complication of circumcision [2]. The true incidence of iatrogenic glans amputation is not known because of underreporting for medico-legal reasons and possible immediate repair at time of injury. Other accidental causes are self-inflicted injuries from acute psychosis and penile tourniquet syndrome from entwining hair etc [3]. On the other hand, glans penis amputation may be offered to patients to treat advanced penile cancers [4].

Penile amputation no matter the cause can be complicated by scaring of the urethral stump (Fig. 1). Hence, late presentation may be accompanied by straining to void or urine retention due to meatal stenosis. There may be bladder wall thickening, bilateral hydronephrosis and renal insufficiency on further evaluation. Psychosexual disorders such as depression with suicidal tendencies can also be a major challenge.

Penile glans reconstruction can be very challenging for the urologist. The aim of reconstruction is to provide a cosmetically acceptable penis, minimize the risk of meatal stenosis, preserve penile length and allow for normal sexual intercourse as much as possible.

[1]Kings Medical Consult (Specialist Urology Clinic), Kumasi, Ghana.
[2]Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana.
[3]Department of Surgery, School of Medical Sciences, UCC, Cape Coast, Ghana.
[4]Department of Surgery, Urology Unit, University for Development Studies – SMHS, Tamale, Ghana.
[5]Department of Surgery, KSMD, College of Health Sciences, KNUST, Kumasi, Ghana.
[6]Seventh Day Adventist Hospital, Dominase, Ghana.
**Corresponding author: E-mail: addaiarhin@yahoo.com;*

Fig. 1. Total glans penis amputation with meatal stenosis from scarring

2. TREATMENT OPTIONS FOR GLANS AMPUTATION

The management of penile glans amputation depends on the duration before presentation and the acute phase management usually involves auto-transplantation [5–9] (Fig. 2a-c). In the first eight hours following injury, auto-transplantation of the properly preserved glanular tissue is possible with significantly high success rate [5,6,10].

Unfortunately, most penile amputations report late with no viable glans for auto-transplantation. Pack and Ariel described a technique in which the penile skin is brought over the ends of the corpora bodies and sutured to the urethra after partial penectomy [11]. This technique does not attempt to reconstruct the glans penis; thus, cosmesis is not guaranteed. It has a 6% chance of meatal stenosis and risk of penile shortening.

Skin grafts have also been used to fashion out a neo-glans penis after partial penile amputation or used for resurfacing the glans after tumor excision [12,13]. However, reconstructing a neo-glans with skin grafts may not achieve satisfactory cosmetic results as the neoglans may blend with the penile shaft skin.

Belinky et al. described the use of urethral flaps to reconstruct neo-glans penis with acceptable cosmesis in ten patients with partial penile amputations for penile cancers [14]. This technique may require a long urethra and may be associated with penile curvature and shortening.

Scrotal flaps have also been used for glanuloplasty after partial penectomy with satisfactory penile function and appearance [15]. Again this technique has a high chance of stricture formation at the anastomotic site and hair may grow in the urethra over time despite laborious depilation at surgery. It is also a two-stage procedure.

Pedicled myocutaneous flaps based on the inferior epigastric artery have also been used to reconstruct the glans penis after glans amputation [16,17]. Unfortunately, this technique requires expertise in microsurgery and instruments and may not be applicable in resource poor centers. Flap necrosis and infection may also develop.

We describe a technique of glanuloplasty with oral mucosa graft following glans amputation, similar to the method described by Venkov and Slavov [18] for glanular reconstruction. This technique is simple to perform; it is a one stage procedure, provides excellent cosmesis especially in blacks males, and can easily be done in resource poor centers. The method is also applicable to glans amputation for penile cancers.

Oral mucosa grafts are currently preferred to other biomaterials for urethral reconstruction in hypospadias, urethral strictures etc. and are suitable for glanuloplasty in penile or glans amputation.

The advantages include hairlessness, thick elastin-rich epithelium which makes it tough yet easy to handle and a thin and highly vascular lamina propria, which facilitates inosculation and imbibitions [19].

It is also easy to harvest with little morbidity at the donor site, low incidence of meatal stenosis and excellent cosmesis when used for glanuloplasty.

One potential problem with this method of glanuloplasty is the high risk of graft mobility at the recipient site which can hinder neovascularization for adequate graft adaptation. This is prevented by placing anchoring stitches. Another potential problem is graft contraction with resultant meatal stenosis.

The authors however, did not observe this complication after 6 years of follow-up on one patient who underwent oral mucosa graft glanuloplasty for glans amputation.

The oral mucosa is naturally exposed to a wet milieu and when used to graft a neoglans, it dries up and becomes scaly. We overcame this challenge with twice daily topical application of vaseline.

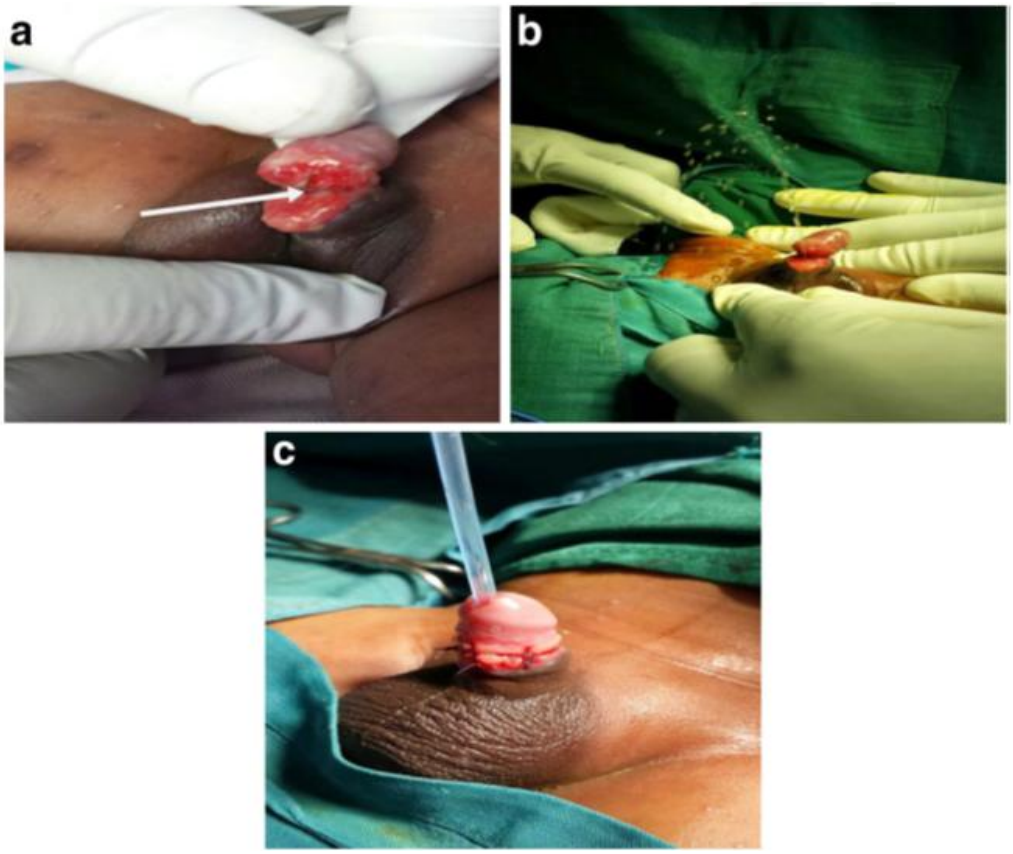

Fig. 2.(a) Partial penile amputation from tourniquet effect of a suture material (arrowed) seen within 48 hours. (b) Patient urinating immediately after release of tourniquet. (c) Immediate post-repair

3. TECHNIQUE OF GLANULOPLASTY USING ORAL MUCOSA GRAFT

3.1 Pre-operative Preparation

Patients who present with urine retention from a scarred meatus should first have suprapubic catheterization. Urine routine examination is done and if suggestive of infection, culture and sensitivity

are mandatory. Other tests include a full blood count and kidney function test in preparation for surgery.

Patient positioning is supine and general anaesthesia preferably with nasotracheal intubation is administered. Nasotracheal intubation permits easy harvest of buccal mucosa or even oral labial mucosa graft as compared to endotracheal intubation.

3.2 Description of the Surgical Procedure

Step 1. Harvesting the graft

A 4 cm long, 2 cm wide buccal or lower lip oral mucosa graft (Fig. 3) is harvested. Either of these grafts can be used. The submucosa is injected with lidocaine mixed with epinerphrine (1:200,000) to raise a wheal which helps with easy harvesting of the graft whiles ensuring adequate haemostasis. A gauze is placed appropriately in the pharynx to prevent blood from entering the trachea or oesophagus. The mucosal defect at the donor site is closed primarily with absorbable sutures or left to heal by secondary intention especially when the defect is too wide. The graft may be prepared by defatting it and excising muscle fibers so as to retain only mucosa and lamina propria, tiny fenestrations made into it and then kept in saline until needed.

Fig. 3. Oral mucosa graft being harvested from the lower lip raising a wheal with lidocaine/epinephrine solution

Step 2. Preparation of recipient site

Surgery involves a circumcising incision, degloving of the penile skin, and excision of the scar tissue at the distal end exposing the corporeal bodies in the process. The urethral end is identified and catheterized with an appropriate sized urethral catheter. The distal penile skin is shortened by 2 cm leaving raw surfaces of the corporeal bodies distally and sutured into place with vicryl 5/0 (Figs. 4 & 5).

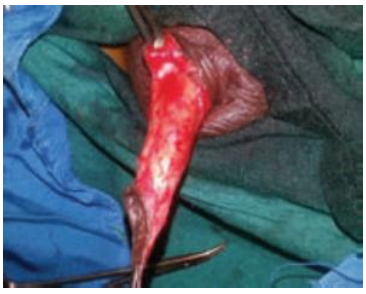

Fig. 4. Penis degloved leaving scar tissue at the end which is excised

Fig. 5. Penile skin shortened by 2 cm and sutured into place

Step 3. Buccal mucosa graft onlay

One edge of the graft is sutured to the penile skin proximally and the other edge is anastomosed to the urethral mucosal margins (Fig. 6). Anchoring sutures are applied to stabilize the graft on the corporeal bodies.

Fig. 6. Oral mucosa used to graft the raw area of the corporeal bodies approximating one edge proximally to the penile skin and the other to the urethral margins

3.3 Post-operative Management

Postoperatively, closed wound dressing with vaseline gauze is applied to the recipient site and only changed on the fifth day. It is then changed at four-day intervals on two occasions. The urethral catheter is taken out on the 14th day after surgery.

The graft improves in cosmetic appearance over time (Figs. 7-11). The donor site heals within two weeks with no morbidity. In the long term, patients have a widely patent urethral meatus with no scarring at the distal end of the penis and acceptable cosmesis (Fig. 11).

Fig. 7. Glans at two weeks following surgery

Fig. 8. Glans at eight weeks following surgery

Fig. 9. Glans at six months (lateral view)

Fig. 10. Glans at six months (AP view)

Fig. 11. Glans at six years (AP view)

4. CONCLUSION

Glanuloplasty with oral mucosa graft following total glans penis amputation is simple and reproducible with satisfactory cosmetic and functional results and may be extended to the management of both traumatic and non-traumatic distal penile amputations.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Biography of author(s)

Dr. Kwaku Addai Arhin Appiah
Kings Medical Consult (Specialist Urology Clinic), Kumasi, Ghana and Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

Research and Academic Experience: Research coordinator; Urology unit, Department of Surgery, Komfo Anokye Teaching Hospital with several peer reviewed publications and conference abstract presentations.
Part time Senior Lecturer: Department of Surgery, KSMD, College of Health Sciences, KNUST
Fellow of the Ghana College of Physicians and Surgeons and
West African College of Surgeons and the International College of Surgeons

Research Area: Reconstructive Urology, Onco-urology and General Urology

Number of Published papers: 14

Special Award (If any):
1. Best Poster award, Session on Genitourinary trauma, 37th Congress of the Society of International Urologists, Lisbon, Portugal. October 18 – 22, 2017
2. Best Poster award, Symposium for Affordable New Technologies in Urology, 34th Congress of the Society of International Urologists, Glasgow, Scotland. 2014
3. Prof. Anugwu/ Mbonu Prize for best graduating student in Urology - West African College of Surgeons - 2012
4. Kurt Lennert Prize for Overall best student in Surgery - 2003 (KNUST)

Dr. George Amoah
Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

Research and Academic Experience: Extensive research experience with several peer reviewed publications and conference abstract presentations.

Senior Lecturer: Anglican University College of Technology, Nkoranza, Ghana
A fellow of the West African College of Surgeons

Research Area: General Urology/ Reconstructive Urology

Number of Published papers: 14

Special Award (If any):

1. Best Poster award, Session on Genitourinary trauma, 37th Congress of the Society of International Urologists, Lisbon, Portugal. October 18 – 22, 2017
2. Best Poster award, Symposium for Affordable New Technologies in Urology, 34th Congress of the Society of International Urologists, Glasgow, Scotland.2014

Patrick Opoku Manu Maison
Department of Surgery, School of Medical Sciences, UCC, Cape Coast, Ghana.

Research and Academic Experience: Extensive research experience with several peer reviewed publications and conference abstract presentations.
Senior Lecturer: Department of Surgery, School of Medical Sciences, University of Cape Coast
A fellow of the Ghana College of Physicians and Surgeons and West African College of Surgeons

Research Area: Pediatric urology, Reconstructive Urology and Uro-oncology

Number of Published papers: 15

Special Award (If any):

1. MBONU Prize for Best Candidate in Urology for West African College of Surgeons- 2014
2. Best Poster award, Session on Genitourinary trauma, 37th Congress of the Society of International Urologists, Lisbon, Portugal. October 18 – 22, 2017
3. Best Poster award, Symposium for Affordable New Technologies in Urology, 34th Congress of the Society of International Urologists, Glasgow, Scotland. 2014

Edwin M. T. Yenli
Department of Surgery, Urology Unit, University for Development Studies – SMHS, Tamale, Ghana.

Research and Academic Experience: Abstract presentations at conferences and published several manuscripts in peer review journals
Clinical coordinator of School of Medicine and Health Sciences,
Senior Lecturer: Department of Surgery, Urology Unit, School of Medicine and Health Sciences, University for Development Studies, Tamale, Ghana.
Fellow Ghana College of Physicians and Surgeons (FGCS)
Fellow International College of Surgeons (FICS)

Research Area: Infections in Urological Practice, Urological Emergencies, Reconstructive Urology and Uro-oncology.

Number of Published papers: 16

Special Award (If any): Best Poster award, Symposium for Affordable New Technologies in Urology, 34th Congress of the Society of International Urologists, Glasgow, Scotland. 2014

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