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# Neo-glans reconstruction for penile cancer: Description of the primary technique using autologous testicular tunica vaginalis graft

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**KEYWORDS**

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Neo-glans reconstruction;
Tunica vaginalis testis;
Split-thickness skin graft

**ABBREVIATIONS**

BM, buccal mucosa;
CC, corpora cavernosa;

**Abstract** Partial penectomy (glansectomy with/or without distal corporectomy) is an acceptable alternative for smaller distal pT3 penile carcinoma lesions in highly motivated and compliant patients. The authors describe a novel technique of neo-glans reconstruction using a tunica vaginalis (TV) testis allograft. However, due to an unclear resection margin on final histology, the patient underwent re-do surgery with a neo-glans revision using the well-established mesh split-thickness skin graft (STSG) technique. The penile length was preserved and the penile and bulbar part of the urethra was additionally mobilised in order to obtain a natural and aesthetic result for the meatus.

Neo-glans reconstruction with TV coverage may be another promising alternative, which certainly requires further evaluation. We believe that the donor-site associated morbidity is minimal when compared to other harvesting sites. However, this is just an assumption, because direct comparison data on grafting techniques and neo-glans reconstruction are not available. Nevertheless, we think that for re-do procedures a

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NVB, neurovascular bundle;
STSG, split-thickness skin graft;
TV, tunica vaginalis;
TVTG, tunica vaginalis testis graft

standardised approach using a STSG technique should be the treatment method of choice.



## Introduction

Traditional total/partial penectomy is the 'gold standard' for the treatment of invasive penile carcinoma. However, poor aesthetic, functional, and psychological outcomes have been reported in patients who undergo this procedure [1]. The reconstruction of penile anatomy and formation of the neo-glans, in an attempt to restore the primary appearance and functional improvement after this mutilating surgery has been the matter of intensive investigation over the last decade. The primary goal is to optimise postoperative voiding and potentially sexual functioning. The early results of organ-sparing techniques without glans reconstruction have demonstrated mixed and unsatisfactory results, as expected [2].

More recently, enhanced penile-sparing techniques, such as reconstructive glanduloplasty using split-thickness skin grafts (STSGs), buccal mucosa (BM) or scrotal flaps exhibit more favourable outcomes, because they have the ability to restore the anatomy and aesthetic appearance of the penis [3–5]. The authors present a novel technique for neo-glans reconstruction using an autologous tunica vaginalis (TV) testis free graft (TVTG) in the context of penile-preserving surgery for penile carcinoma.

## Patient's presentation and surgical technique

The authors report a case of a 56-year-old patient with biopsy confirmed high-grade penile squamous cell carcinoma (20 mm), arising from the glans penis with invasion of the glandular urethra. The patient was managed with an intention-to-treat and spare the organ, followed by neo-glans reconstruction (from corpora cavernosa [CC]) using TVTG.

After general anaesthesia induction, the patient was placed supine and a tourniquet secured at the base of the penis. A circumferential skin incision was made ~5 mm proximal to the coronary sulcus, followed by penis degloving to its base. The deep dorsal vein was isolated and secured with 3–0 polyglactin 910 suture (Vicryl®; Ethicon Inc., Somerville, NJ, USA) at the level of the primary incision. Then the meticulous dissection of the neurovascular bundle (NVB) was performed with full exposure of the tunica albuginea. After suturing the NVB, the transverse incision separated the NVB from the distal tips of the CC and the glans. Partial penectomy was completed and the specimen sent for frozen-section analysis. The resection margin of the CC, tunica albuginea, as well as the proximal margin of the urethra was negative.

The neo-glans was recreated from CC using an inverted 3–0 polyglactin 910 running suture 'fish-mouth' closure. The urethra was slightly spatulated from the ventral aspect. About 1 cm distal from the tip of the CC, the penis shaft skin was sutured to the Buck's fascia with 4–0 polyglactin 910 to create the neo-sulcus coronarius (Fig. 1). At this stage the tourniquet was released.

A 3-cm transverse incision was made at the anterior wall of the right hemiscrotum. The parietal wall of the TV was exposed (Fig. 1). To obtain an optimally sized graft, a rectangle-shaped TV was harvested along the epididymal area, after precise measuring of the newly formed neo-glans area to be grafted. Following careful adaption, the graft was approximated with absorbable 5–0 polyglactin sutures at the external meatus and 4–0 polyglactin 910 sutures at the newly formed neo-sulcus. We did not apply quilting sutures.

Finally, a gentle compressive bandage was applied to the penis shaft and neo-glans (the graft was covered with baneocin [neomycin and bacitracin] and a paraffin-gauze tie-over dressing). At the end of the procedure, we placed a 14-F catheter, no drainage was necessary. A penile local anaesthetic block was used to enhance postoperative analgesia. The patient was advised to restrain from any physical activity for 48 h. The catheter was removed on the postoperative day 7. The patient was instructed on how to wash the graft site with saline solution. A successful complete graft take was considered when the graft did not show any signs of necrosis or desquamation (Fig. 2).

## Results and revision surgery

The graft take was acceptable (on the 20th postoperative day); however, because of the Rx margin, we had to perform additional resection of the urethra in case of high-grade pT3 penile carcinoma. After careful preparation, an additional 10-mm length of the urethra was excised. The frozen-section analysis of the urethral margins and tunica albuginea area of the neo-glans close to the urethral meatus were negative. Therefore, we decided to reconstruct the neo-glans again. We did not compromise the overall length of the penis (Fig. 2). Although, this time we had to mobilise the penile and the distal