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Surgery in Motion

Glansectomy and Split-thickness Skin Graft for Penile Cancer

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Abstract

Background: Penile cancer is a rare malignancy that is confined to the glans in up to four out of five cases. Although descriptions of glansectomy exist, there are no contemporary video explanations or large published single centre series.
Objective: To show the efficacy and safety of glansectomy and split-thickness skin graft (STSG) reconstruction.
Design, setting, and participants: Data were collected retrospectively for patients identified from surgical theatre diaries between February 2005 and January 2016. 177 patients with histologically proven squamous-cell carcinoma on the glans underwent glansectomy and STSG at a tertiary referral centre in the UK. The median follow-up was 41.4 mo.
Surgical procedure: The skin is incised at the subcoronal level and deepened onto Buck's fascia. Dissection is performed over or under Buck's fascia, depending on suspicion of invasion or risk of disease. The glans is excised and a neoglans is created using a STSG.
Measurements: Local recurrence, cancer-specific survival, overall survival, and complications.
Results and limitations: Sixteen out of 172 patients (9.3%) experienced local recurrence during the follow-up period. Eighteen out of 174 (10.7%) patients died of penile cancer, while 29 patients in total died during the follow-up period. Of 145 patients, 9% required operative intervention for complications, including graft loss and meatal stenosis. Limitations include the retrospective data collection and the lack of functional and sexual outcomes.
Conclusions: Glansectomy and STSG comprise a safe procedure in terms of oncologic control and complications for patients with penile cancer confined to the glans penis. Further studies are required to assess functional and sexual outcomes in these patients.
Patient summary: We report on the management of penile cancers confined to the head of the penis using glansectomy and a split-thickness skin graft to recreate the appearance of a glans. This technique is safe and effective, with limited complications.

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1. Introduction

Penile cancer is a rare malignancy and the incidence in the Western World is estimated to be <1.00/100 000 inhabitants; however, in some parts of the world such as Malawi and Brazil the age-standardised incidence can be as high as 2.6–3.3/100 000 inhabitants [1–3].

Historically, excision of the primary lesion with a 2-cm margin would mandate a partial or total penectomy, with minimal concern regarding cosmetic or functional outcomes. A significant reduction in penile length or even loss of the penis can lead to significant issues with masculinity and psychological morbidity [4,5]. Challenging the traditional resection margins and using smaller margins of a few millimetres led to the development and increasing adoption of surgical techniques allowing penile-preserving procedures [6,7].

Up to 80% of penile lesions are confined to the glans or prepuce [8,9]. Austoni et al [10] emphasised that the glans and corporal bodies are anatomically distinct. As a consequence, Bracka [11] advocated the use of glansectomy, and described the technique in detail.

The aim of this study was to illustrate our adoption of Bracka's surgical technique for glansectomy combined with split-skin graft reconstruction of a neoglans. In addition, we present long-term outcomes for the largest retrospective cohort of patients with penile squamous cell carcinoma (SCC) treated with glansectomy and STSG application.

2. Patients and methods

2.1. Surgical technique

2.1.1. Preoperative preparation

Patients with tumours confined to the glans and prepuce that are not eligible for wide local excision are good candidates for glansectomy and STSG. Patients with poor vascular function, diabetes, immunosuppression, or previous radiation to the area are less suitable for graft application; we recommend discussing the higher failure rate for these patients before surgery. Careful examination of the penile lesion is performed to determine clinically if it is confined to the glans only. For cases in which there is suspicion that the tumour invades the tip of the corpora cavernosum, magnetic resonance imaging (MRI) is performed of the penis in an erect state following an intracavernosal injection of 10–20 μg of alprostadil (prostaglandin E1).

Assessment of lymph node status and systemic staging and treatment are performed according to the European Association of Urology guidelines at the time of surgery [12].

2.1.2. Patient positioning and approach

The patient is positioned supine on the operating table and the thigh acting as the donor site for the graft is shaved. Drapes are placed so that one thigh is exposed along with the genitalia. Antibiotic prophylaxis consists of amoxicillin-clavulanic acid and an intravenous aminoglycoside antibiotic on induction.

A subcoronal scalpel incision is used to remove the foreskin and the distal shaft skin to allow a safe resection margin and leave enough penile shaft skin to cover the shaft and a 2-cm corporal tip as the graft bed for the neoglans. If a circumcision has already been performed before glansectomy, a subcoronal incision is used. The incision is deepened until Buck's fascia is visualised and the dartos is mobilised proximally for approximately 10–20 mm to allow advancement of the skin later.

2.1.3. Dissection over versus under Buck's fascia

For cases in which the lesion is confined to the glans and is clearly away from the corporal tips according to imaging or clinical examination, we advocate an approach that uses dissection over Bucks' fascia to excise the glans. This provides a secure vascular bed for placement of the STSG without ligation of the dorsal neurovascular bundle. For cases in which either clinical examination or MRI reveals any suspicion of corporal tip, tunical involvement, or when the disease is of high volume with high-risk features, we prefer to proceed by elevating Buck's fascia together with the glans.

2.1.3.1. Technique using dissection over Buck's fascia. Two Allis clamps are placed on the coronal sulcus to aid gentle traction. A combination of tenotomy and McIndoe scissors are used to carefully identify and develop the relatively avascular plane between the glans penis and Buck's fascia (Figs. 1 and 2). Bipolar diathermy is used for small bleeding points as meticulous haemostasis ensures optimum graft take. Intraoperative frozen sections from each corporal tip are analysed to ensure a tumour-free margin.

2.1.3.2. Dissection under Buck's fascia. A window is made in Buck's fascia para-urethrally using sharp dissection. The tenotomy scissors are then inserted under Buck's fascia to create a plane of dissection to lift off the dorsal neurovascular bundle, which is ligated (Fig. 3). A medium surgical ligaclip is placed on the distal end of the neurovascular bundle and a small Halsted-Mosquito haemostat is placed on the proximal side and tied with 4-0 polyglactin. This is repeated until the penis is circumnavigated to the other side of the urethra. The tenotomy scissors are used to dissect under the distal Buck's fascia and neurovascular bundle so that a flap is circumferentially mobilised. Dissection continues distally over the corporal tips until the urethra is the only structure that remains attached.

2.1.4. Urethral transection and spatulation

Care should be taken to transect the urethra below the tumour, but to allow enough urethral length for spatulation if required so that the urethra opens at the level of the corporal heads (Fig. 4). The cut margin of

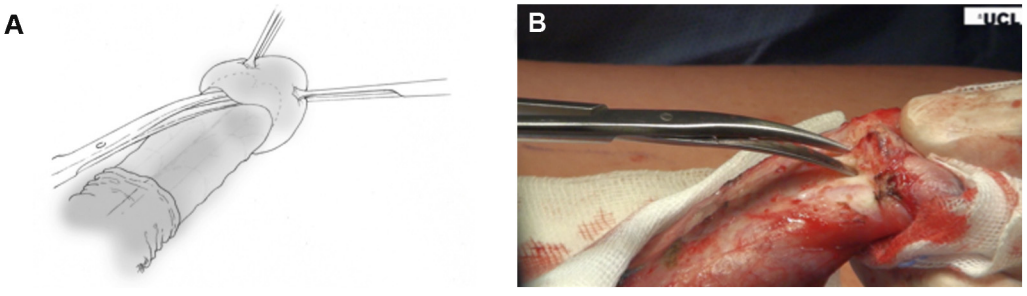

Fig. 1 – Dissection over Buck's fascia. (A) Dissection is facilitated by use of Allis forceps (B) Photograph of the dissection plane.

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