Case report:

Successful restoration of deep open rupturing penile trauma from cutting instrument with complete urethral dissection without microsurgical technique.

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Summary

Penile trauma presents a challenge for the urologist, since correct and prompt surgical treatment can guarantee the successful outcome of the reconstruction. We present the case of a young man with a deep trauma of the ventral aspect of the penile shaft involving the urethra, as a result of a failed attempt of amputation by another person, who was managed with urgent surgical reconstruction without microsurgical techniques and had a perfect aesthetic and functional outcome. Although microsurgical correction is considered the treatment of choice for such injuries, in centers with no such facilities and in selected cases classic surgical techniques offer an excellent alternative.

Keywords:
penile trauma, urethral injury, plastic reconstruction

Introduction

Penile trauma commonly occurs from all-causes accidents. Other cases include iatrogenic penile traumas during circumcision surgery procedure (especially in countries where they are performed for religious reasons) and intentional self-harm of psychotic patients. Criminal acts, committed by third parties, are also reported as in our case (1), (2), (3), (4).

Penile traumas, though relatively rarely encountered in daily urological practice, require immediate assessment of the trauma extent, in order to select the applicable
correction procedure, for an aesthetically and functionally restoration of the phallus and in many cases of the urethra.

![Classification of penile traumas](image)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Trauma description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Cutaneous laceration/contusion</td>
</tr>
<tr>
<td>II</td>
<td>Buck's fascia (cavernosum) laceration, without tissue loss</td>
</tr>
<tr>
<td>III</td>
<td>Cutaneous abrasion/laceration. Rupture of the balanitis or the outer urethral orifice. Cavernosal or urethral defect &lt; 2 cm.</td>
</tr>
<tr>
<td>IV</td>
<td>Partial amputation. Cavernosal or urethral defect ≥ 2 cm.</td>
</tr>
<tr>
<td>V</td>
<td>Total amputation</td>
</tr>
</tbody>
</table>

* Advance one grade for multiple lesions up to grade V (source: The American Association for the Surgery of Trauma)

Penile dissections are classified into total and partial, in case they regard only a part of the organ. In the latter, the affected aspect of the penis (ventral or dorsal) and the extent of the trauma, significantly contribute in deciding upon the applicable treatment. The reason is that, depending on the trauma surface and apart from the imperative suturing of the corpora cavernosa, either the neurovascular bundle or the urethra may also require correction.

**Case description**

We hereby present a case of a 34-year-old male who was admitted to the our hospital’s Emergency Department with a deep open rupturing penile trauma from cutting instrument, following the attempt of his ex-wife to amputate his penis.

Upon arrival at the hospital, the patient was pale and in a state of shock; blood pressure 120/80 mm Hg, 110 beats per minute (BPM) and his wound was packed with gauzes. Unpacking the wound, we identified a particularly deep trauma located on the ventral aspect and in the midway of the penile shaft, vertically oriented to the longitudinal axis of the phallus. The trauma edges were sharp, without any cutaneous lesions. The patient had mild haemorrhage and thusly we proceeded with intermittent constriction at the base of the penis prior to anaesthesia administration. Blood tests revealed mild leukocytosis [14000 polymorphonuclear leukocytes (PMN)], haemoglobin 13.9g/dl and haematocrit (HCT) 40.7%.

The patient was immediately taken to the operation room (OR), where we established total dissection of the anterior urethra, dissection of the left corpus cavernosum by 2/3 of its thickness and of the right corpus cavernosum by 1/3 of its thickness (Fig. 1). After the application of a tourniquet at the base of the penis, we expanded the existing incision by 1cm longitudinally on the ventral aspect, directed towards the balanus.
Subsequent to the preparation of the corpora cavernosa, we restored their continuity by suturing their tunicae albuginea with isolated Vicryl 2-0 sutures. Next, we performed an end-to-end urethral anastomosis with isolated absorbable Vicryl 5-0 sutures above an 18-Fr Foley urinary catheter. We then proceeded with suturing the Buck fascia and the skin. The trauma was classified as 4th grade, according to the scoring scale of the American Association for the Surgery of Trauma (Table 1). The patient was post-operatively administered with antibiotics (cefoxitin and netilmicin), he exhibited stable post-operative progress and was discharged with an 18-Fr urinary catheter 5 days after his admission.

Three weeks later, the surgical site was excellently healed and the urinary catheter was removed. The patient urinated with ease and the uroflow examination showed a normal plateau-free urine flow curve, Qmax=32.5 ml/sec and no post void residual (PVR). Two weeks after the first post-operative follow up, the patient reported easy urination and normal erections while the aesthetic result of the surgical restoration of his penis was remarkable (Fig. 2). He was subjected to uroflowmetry anew, the results of which were within normal ranges (Qmax=33 ml/sec). Unfortunately, the patient missed his scheduled follow up and thusly no new information exists on his further progress.

Discussion

Early surgical management of penile traumas and the surgeon’s experience constitute important factors upon which successful restoration depends. The result of the reported case demonstrates that surgical restoration of a deep trauma on the ventral aspect of the penis from cutting instrument is treatable without microsurgery techniques and the outcomes can be aesthetically and functionally outstanding both for erection and urination.
Haemorrhage, which accompanies corpora cavernosa dissection, is the main reason for emergency operations and while haemodynamic stability should be the primary concern, it should not delay the decision process upon the applicable surgical procedure or the procedure itself. In any case, whatever the applicable technique, the urologist has to bear two significant parameters in mind: the functional restoration of the organ and the aesthetic outcome (2),(5),(6).

The first recorded case of amputated penis replantation traces back in 1929 by Enrich. In 1968, McRoberts described some cases managed with conventional approaches, without microsurgery techniques, which involved the correction of the urethral continuation and the corpora cavernosa; the potential to suture the dorsal vein of the penis and the need to depress the organ into the scrotum in severe skin lesion cases are reported as well (1),(3),(4). In a large series of patients in Thailand, many patients were also managed without microsurgery and exhibited good results (2).

The first microsurgery restoration cases were documented in 1977. Currently, microsurgery, is considered the most advisable treatment method of such traumas (1),(2),(3),(6). However, in certain cases, non-microsurgery management can deliver comparable outcomes (2),(4).

Studies revealed that the restoration of the organ’s haematosis following a macroscopic replantation is performed via the spongy tissue of the corpora cavernosa, albeit, in our case, the dorsal artery and vein remained intact and consequently the restoration of haematosis and the equally important venous return, were not particularly challenging postoperatively (3),(7). Even in cases of microsurgical replantation, the restoration of the cavernous arteries’ continuity is not advised due to its technical difficulty, especially if the trauma is peripheral. Moreover, it still remains to be established whether the end-to-end anastomosis significantly contributes to the restoration of haematosis. On the contrary, when the dorsal artery is dissected, the effort to restore its continuity is recommended (1), (2), (4). In addition, microsurgical management is neither advocated as imperative for the preservation of the phallic sensitivity and the erectile function nor does it guarantee it (5), (6). It is noteworthy that desirable functional outcomes after restoration without microsurgery technique have been reported even on neonates (7).

With regard to urethral restoration, it is of great significance to early identify the trauma type and the assault instrument, where applicable (6),(7). In the present case study, the dissection of the urethra was particularly sharp, vertically oriented to its longitudinal axis, facilitating the end-to-end anastomosis. During surgery, the need for the mobilization of the urethra to a certain extent to accommodate suturing may arise. Nevertheless, the preparation needs not to be extensive; while the anastomosis can be sutured in a tension-free fashion since the rich haematosis of the corpus spongiosum favors the accurate healing of such traumas. Careful suturing of the corpus spongiosum and overlying skin is very important in the prevention of fistula development (8).
The main immediate postoperative complications a surgeon should consider include trauma infection and cutaneous necrosis. To avoid such conditions, meticulous irrigation of the affected area during surgery, debridement of the trauma edges and perioperative antibiotic coverage are essential (3),(4),(5),(6).

To conclude, the early and anatomically correct restoration of deep open rupturing penile traumas constitutes the ‘corner-stone’ in their management. Delaying the surgical procedure, in case no microsurgery means are available to treat the case, may not result to the patient’s benefit given that, in certain cases, classic surgical techniques may deliver comparable results. Certain trauma localization as well as dorsal artery or neurovascular bundles dissection necessitate the use of microsurgical techniques.

Περίληψη

Οι τραυματικές κακώσεις του πέους αποτελούν πρόκληση για τον ουρολόγο καθώς η σωστή και έγκαιρη αντιμετώπισή τους διασφαλίζει την αποκατάσταση του οργάνου. Παρουσιάζουμε την περίπτωση νέου άνδρα ο οποίος, μετά από απόσπασμα ακρωτηριασμού από έτερο άτομο, προσήλθε με τραύμα της κοιλιακής επιφάνειας του πέους που συμπεριλάμβανε και την ουρήθρα, το οποίο αντιμετωπίστηκε με επείγουσα χειρουργική αποκατάσταση χωρίς μικροχειρουργική τεχνική, με άριστο αισθητικό και λειτουργικό αποτέλεσμα. Αν και η μικροχειρουργική αποκατάσταση θεωρείται η αντιμετώπιση εκλογής σε τέτοιους τραυματισμούς, σε κέντρα όπου δεν υπάρχει τέτοια δυνατότητα και σε επιλεγμένες περιπτώσεις οι κλασσικές χειρουργικές τεχνικές αποτελούν μία άριστη εναλλακτική μορφή αντιμετώπισης.

Λέξεις ευρετηριασμού:
τραύμα πέους, κάκωση ουρήθρας, πλαστική αποκατάσταση

References

