Case Study of the Month

Urethra Reconstruction Following Resection of Penile Leiomyosarcoma

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1. Case report

A 56-yr-old man with leiomyosarcoma of the penis underwent subcutaneous penectomy and radicalinguinal lymphadenectomy bilaterally (Catalona). Subcutaneous penectomy included resection of the corpus spongiosum, corpora cavernosa, urethra, glans, and tunica albuginea. The phallic preservation technique left a sensate penile skin tube. Histology showed a 5-cm tumor of one corpus cavernosum infiltrating the tunica albuginea and the second corpus cavernosum in a mass of spindle cell, malignant, mesenchymal tumor (Fig. 1). Immunohistochemical expression of vimentin by spindle tumor cells was shown (Fig. 2). The tumor was negative for CD31 and factor 8. This was graded as a mitotic active leiomyosarcoma G2 with clear resection margins. The inguinal lymph glands were free of tumor.

The patient was referred 13 mo after tumor resection for definitive reconstruction. On examination he had a preserved skin tube with sensate penile skin but no erectile soft tissue or urethral component and no glans (Fig. 3). The urethral remnant formed a perineal urethrostomy, with the patient retaining control over the internal urethral sphincter.

The patient’s reconstructive requirements included reconstruction of the penile urethra, reconstruction of the glans, and the provision of sufficient soft tissue volume and turgidity to allow intercourse. A single-stage penile and urethral reconstruction using a partly de-epithelialized forearm flap within the preserved sensate penile skin tube was planned to best meet these requirements.
Surgery was performed under general anesthesia with two operative teams. One team recreated the defect to be reconstructed by resecting the severe scar formation inside the penile tube (Fig. 4) and prepared the proximal urethra in the perineal region for urethral anastomosis. The femoral vessels were prepared as recipient vessels.

Because no skin was required for external reconstruction, the design of the radial forearm flap was limited to a longitudinal skin paddle to allow tubularization for urethral reconstruction, in addition to a distal transverse paddle for glans reconstruction. The remaining flap skin was de-epithelialized. This preserved the maximum volume of tissue and ensured pliability of the flap during tubularization.

After the radial forearm flap was raised, the longitudinal skin paddle was tubularized around a catheter (Fig. 5). An additional layer was sutured over the neourethra to maximize waterproofing of the suture line. The de-epithelialized skin and fascia were then wrapped around the neourethra to provide sufficient bulk to reconstruct the penile shaft. The distal skin paddle was shaped to recreate the glans.

Two sensory nerves were included with the forearm flap to provide innervation of the neopenis glans. The flap was raised in a standard fashion and inserted through the penile skin tube. Care was taken to avoid kinking and avulsion of the pedicle. The arterial anastomosis was performed end-to-side and the venous anastomosis in an end-to-end manner. The nerve coaptation was performed to branches of the external pudendal nerves.

The urethral anastomosis was performed to the proximal urethral remnant and the radial forearm fascia was wrapped around the anastomosis to provide waterproofing of the repair. Following inset, the flap perfused well, and a satisfactory aesthetic result was achieved (Fig. 6). The donor site was closed with a full-thickness skin graft from the left lateral groin.

The flap transfer was successful without postoperative complications. After the catheter was removed, the patient was able to void urine on postoperative day 9; he was discharged on postoperative day 10. The patient retained total control over the internal urethral sphincter and was able to void successfully from the tip of the reconstructed penis with no evidence of fistula or stricture.
The aesthetic appearance and position of the reconstructed penis was very natural because of the preserved penis skin, which retained sensitivity. Because the native penile skin tube was preserved, the future insertion of a permanent erectile prosthesis remained possible. This was declined by the patient, who had sufficient turgidity to perform intercourse. The patient remains free of any local recurrence or metastasis 41 mo following tumor resection (28 mo after penile reconstruction).

EU-ACME Question

Please visit www.eu-acme.org to answer the below EU-ACME question on-line (the EU-ACME credits will be attributed automatically). The answer will be given in Case Study of the Month: Part 2, which will be published in next month’s issue of European Urology.

Question:
At immunohistochemistry, leiomyosarcoma usually does NOT stain positively for which of the following markers:

A. Smooth muscle actin
B. S 100
C. HMB 45
D. Vimentin