

Surgery Illustrated

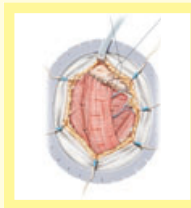
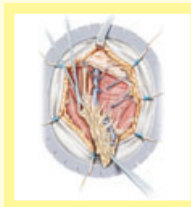
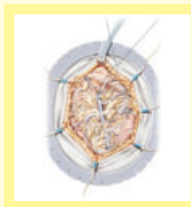
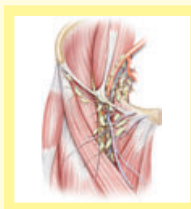
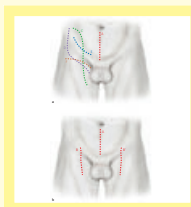
Surgical Atlas

Surgical management of penile carcinoma: the inguinal nodes

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ILLUSTRATIONS by STEPHAN SPITZER, www.spitzer-illustration.com



INTRODUCTION

The management of the inguinal nodes in patients with penile carcinoma has engendered much controversy over the years. Major issues include: (i) the value of sentinel node biopsy; (ii) which patients are candidates for ilio-inguinal node dissection; (iii) the merits of early vs delayed ilio-inguinal lymphadenectomy; and (iv) the choice of surgical incisions.

The concept of a sentinel node biopsy for penile cancer was first popularized by Cabanas [1], who postulated that the primary deposition site of penile carcinoma was in the superficial inguinal nodes at the junction of the saphenous and femoral veins, and that nodes at this anatomical site could be biopsied to predict nodal involvement. However, subsequent series reported false-negative rates of up to 40% with sentinel node biopsies.

Many urologists also embraced the concept that only patients with palpable inguinal nodes should undergo lymphadenectomy. However, recent work by Tabatabaei and McDougal [2] showed that the grade and stage of the primary tumour is highly predictive of regional node involvement, and is more reliable than a physical examination; their data appear in Table 1. Because of this pathological data, many urologists have

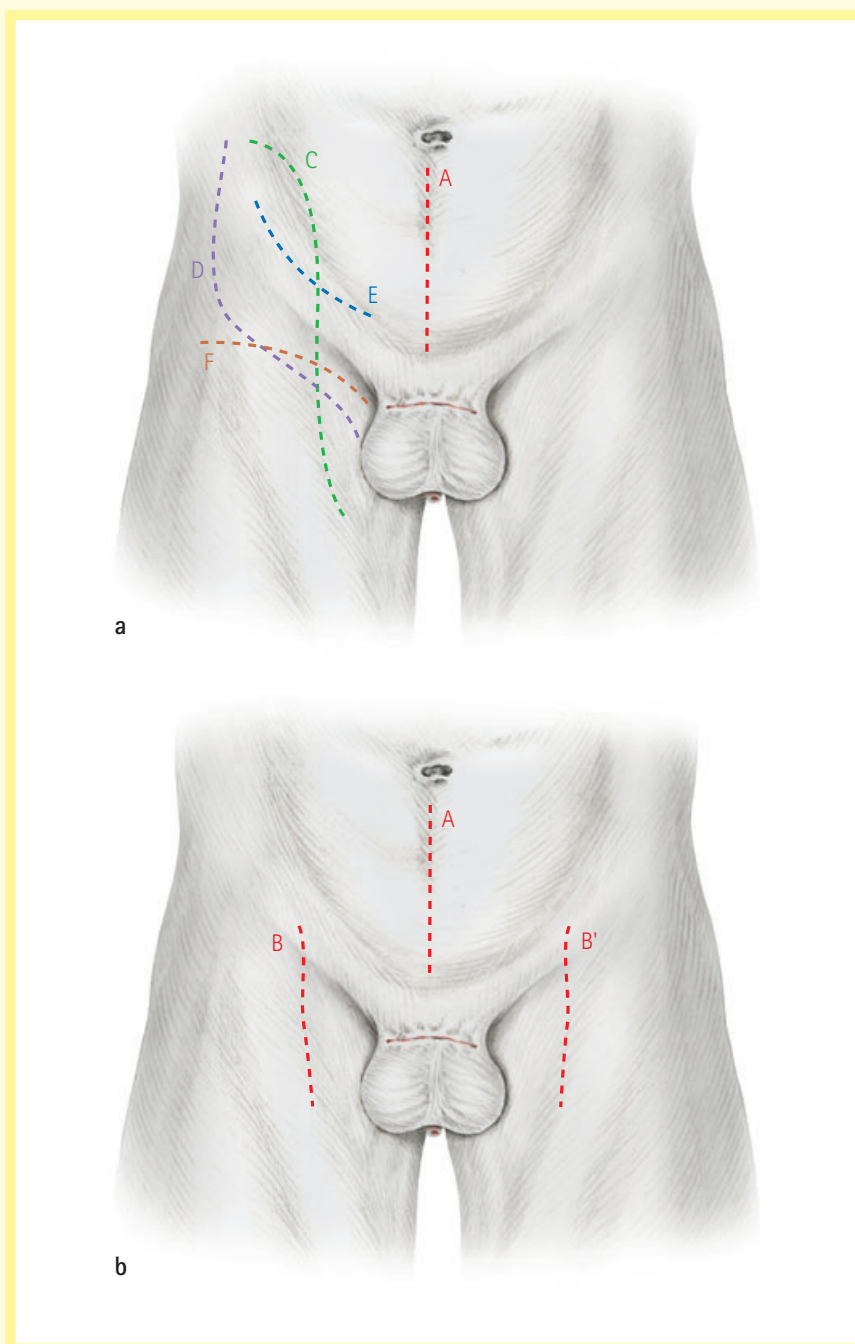
abandoned the practice of treating patients who have palpable inguinal nodes with 6 weeks of antibiotics and then only operating on those in whom the palpable nodes persist.

PLANNING AND PREPARATION

Typically, there is a 2-week interval between surgery for the primary penile lesion and the node dissection. This allows the patient to recover from the penile surgery, and for an assessment by pelvic MRI. In addition to the physical examination and the predictive value of the pathology of the primary lesion, pelvic MRI is a valuable staging tool to document the location of suspicious inguinal or pelvic nodes. Newer techniques are being developed that might be more accurate in identifying positive nodes [3,4].

TABLE 1 The positive node rate based on primary tumour stage and grade. From Tabatabaei and McDougal [2]

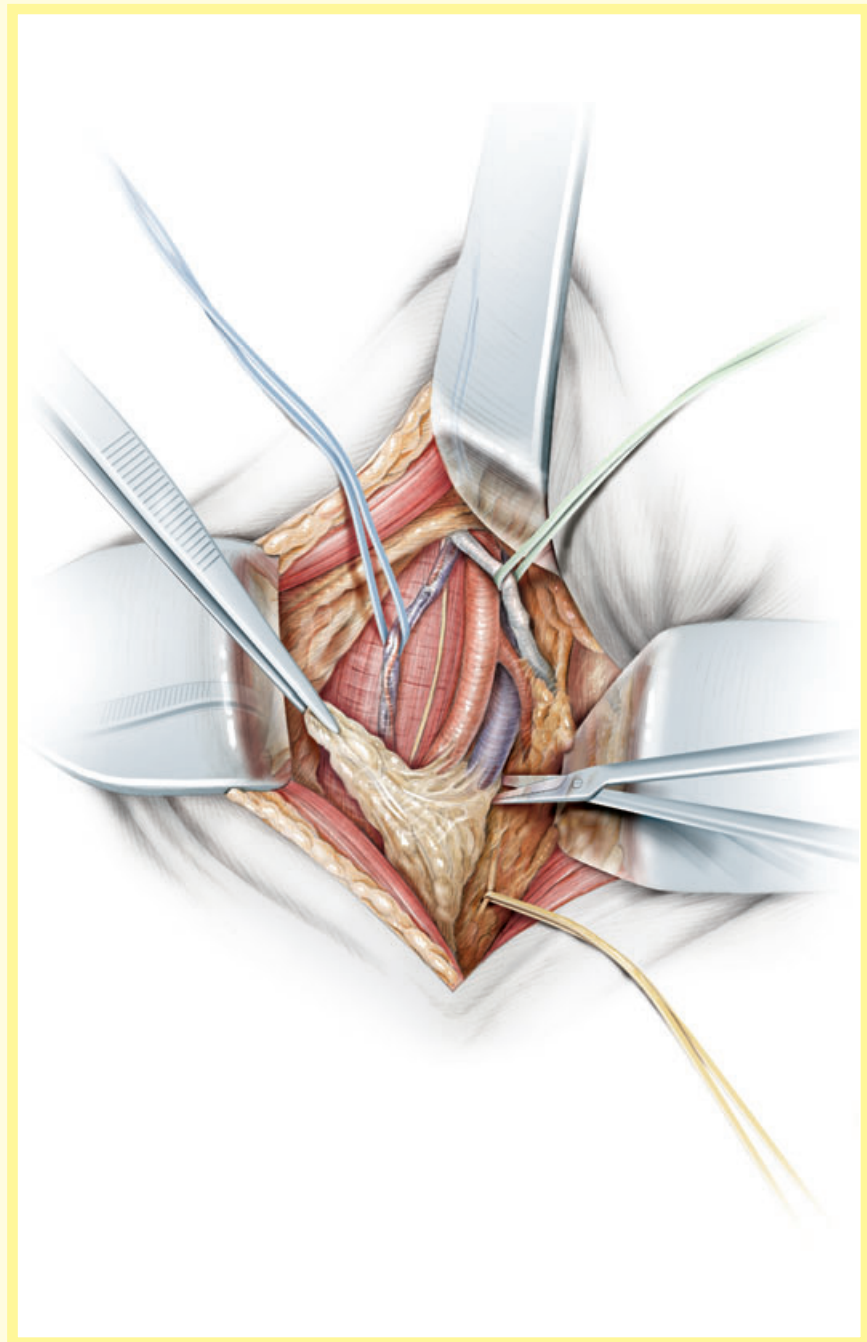
Pathological grade/stage	Positive node rate, %
Well differentiated	24
Moderately differentiated	46
Poorly differentiated	80–100
Stage T1	5–11
Stage T2	61–75

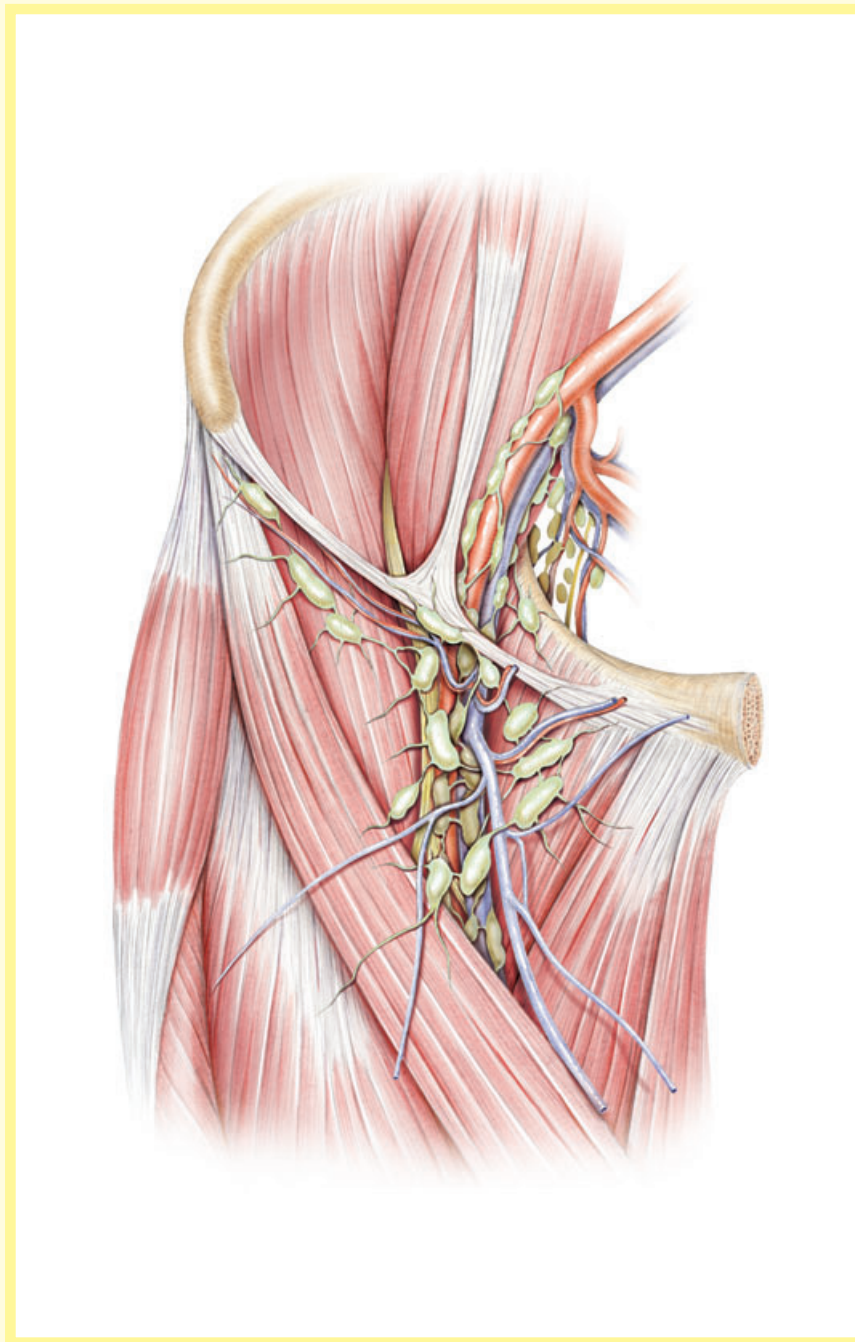
**Figure 1**

Ilio-inguinal lymphadenectomy: After general anaesthesia the patient is placed supine, and prepared and draped in a sterile manner from the umbilicus to the knees. Pneumatic stockings are placed and a urethral catheter inserted. There are many reports devoted to the choice of incisions for ilio-inguinal lymphadenectomy and the alternatives appear in Fig. 1. I prefer three parallel vertical incisions as outlined in Fig. 1b. My rationale for the choice of these incisions is that I have encountered no problems with crossing the inguinal crease, and the vertical groin incisions afford better exposure superiorly.

Figure 2

The procedure commences with a midline incision from the symphysis pubis to midway up to the umbilicus. A standard pelvic lymphadenectomy is performed, as would be done during a radical prostatectomy.



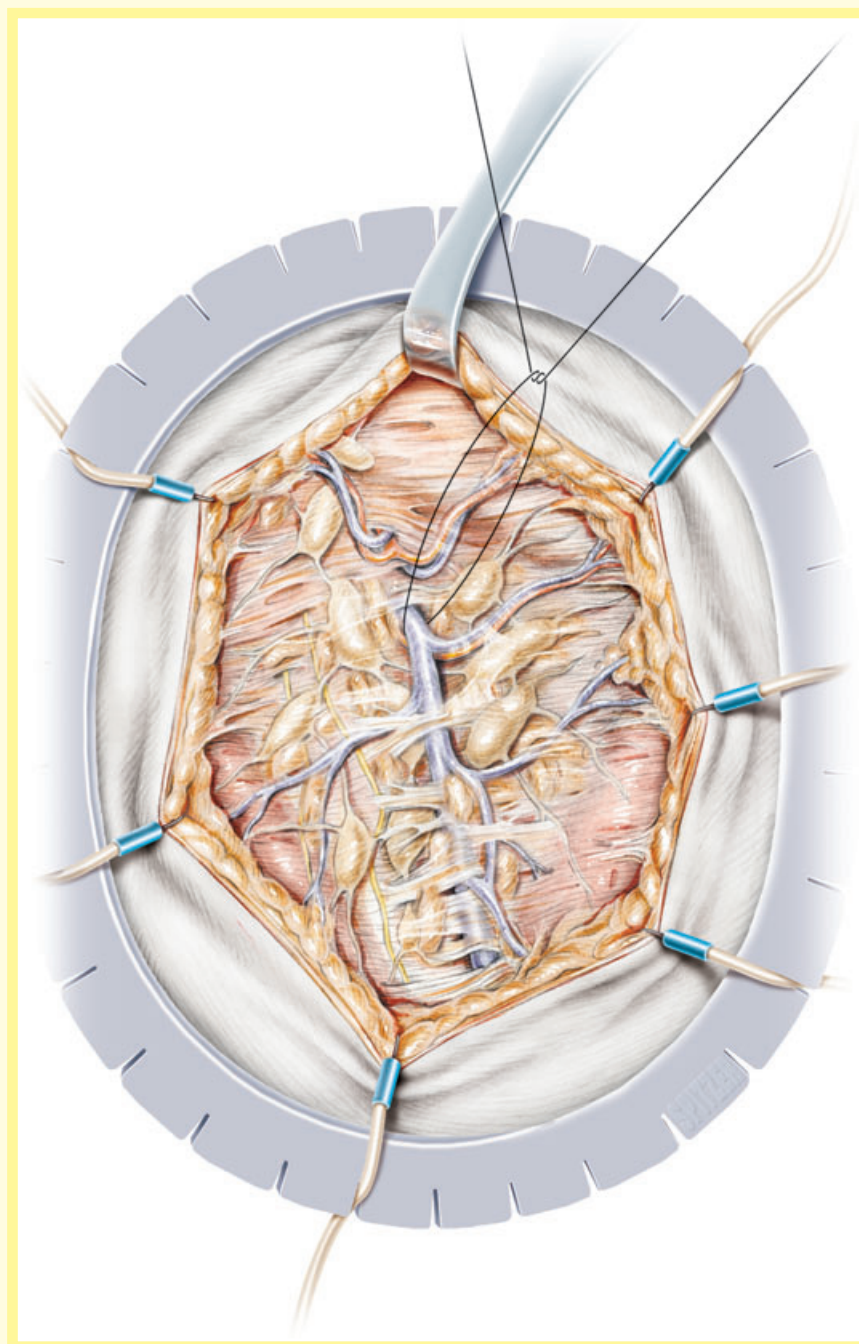
**Figure 3**

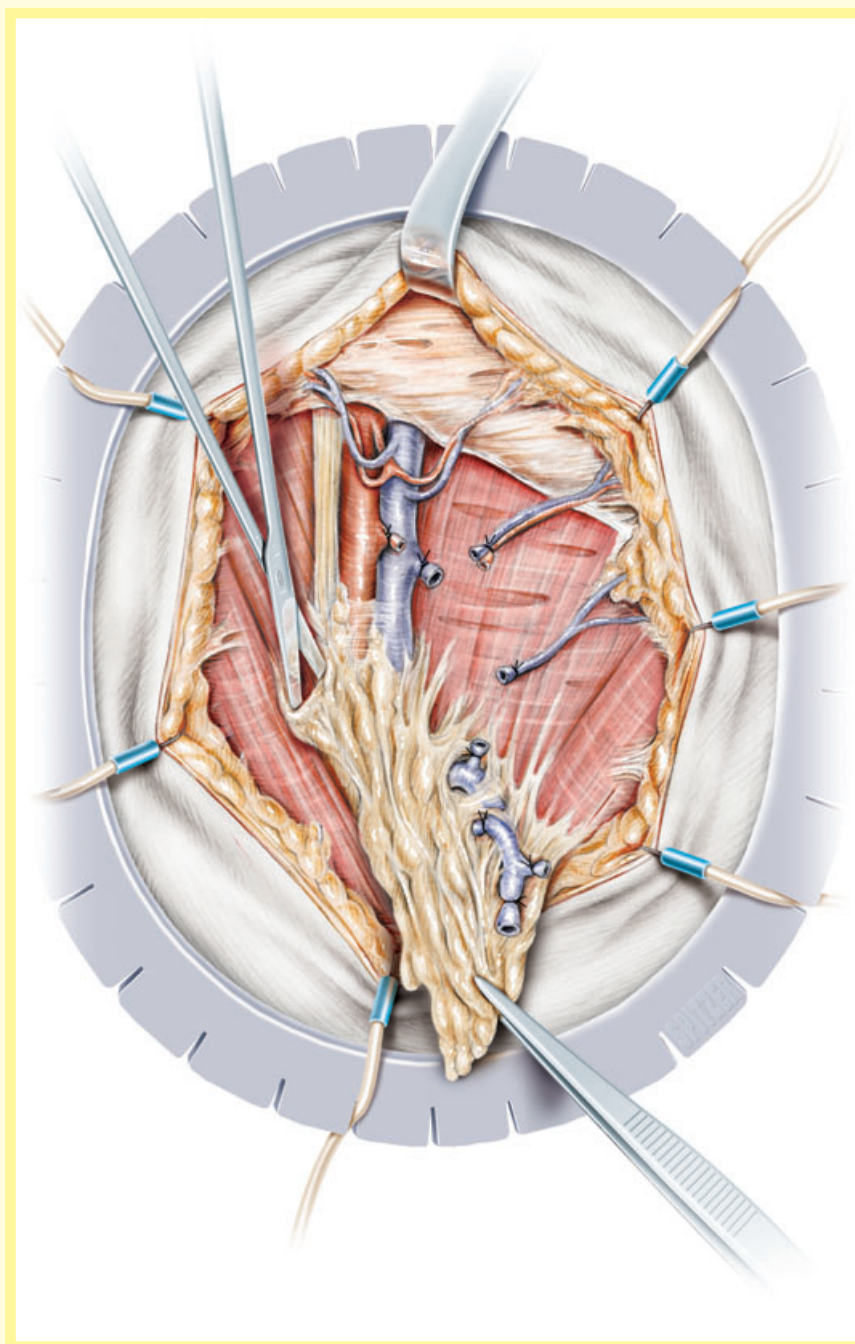
After the pelvic node dissection, attention is turned to the inguinal portion of the procedure. The borders of the surgical dissection are the apex of the femoral triangle distally, the sartorius muscle laterally, the adductor longus muscle medially, and the inguinal ligament superiorly. Some surgeons have advocated a 'modified' inguinal lymphadenectomy in an attempt to decrease the incidence of complications after surgery [5]. The limits of a modified inguinal lymphadenectomy are the saphenous and femoral vein as the lateral margin, the inguinal ligament as the superior margin and the adductor longus muscle as the medial margin. There is a concern that this more limited dissection might result in a higher local recurrence rate, therefore it is generally used when there are no palpable nodes.

Figure 4

I prefer to use a vertical incision that extends beyond the groin crease. An important technical point is to leave enough subcutaneous tissue so as not to undermine the skin flaps. I have found it useful to use the Lone Star retractor (Lone Star Medical Products, Stafford, TX, USA) to minimize handling of the skin edges [6].

The first landmark in the inguinal node dissection is the saphenous vein. When a complete inguinal node dissection is planned, as in the case of bulky disease, the saphenous vein is divided to facilitate the mobilization of a larger nodal packet. In the modified dissection in the case of less extensive or impalpable disease, the saphenous vein can be spared.

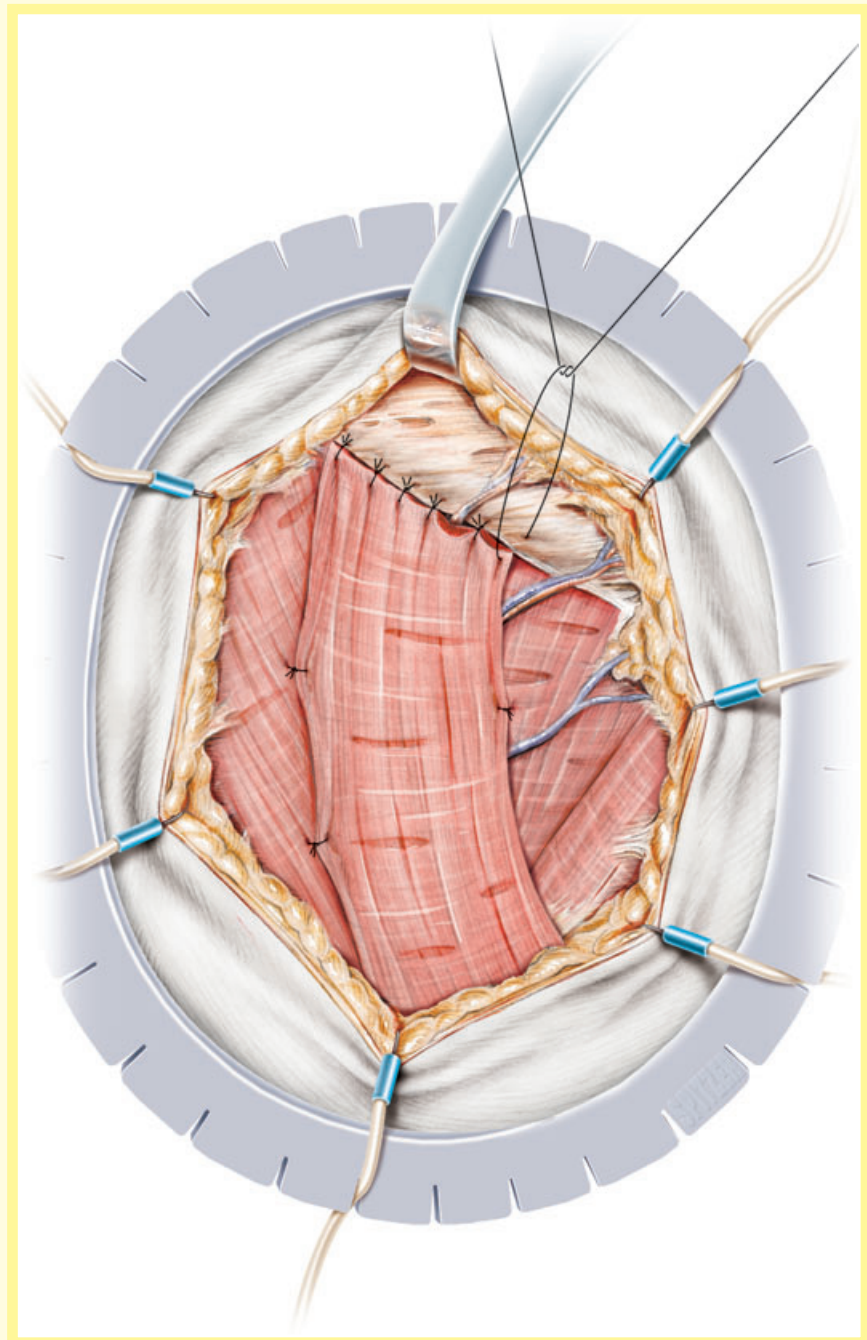


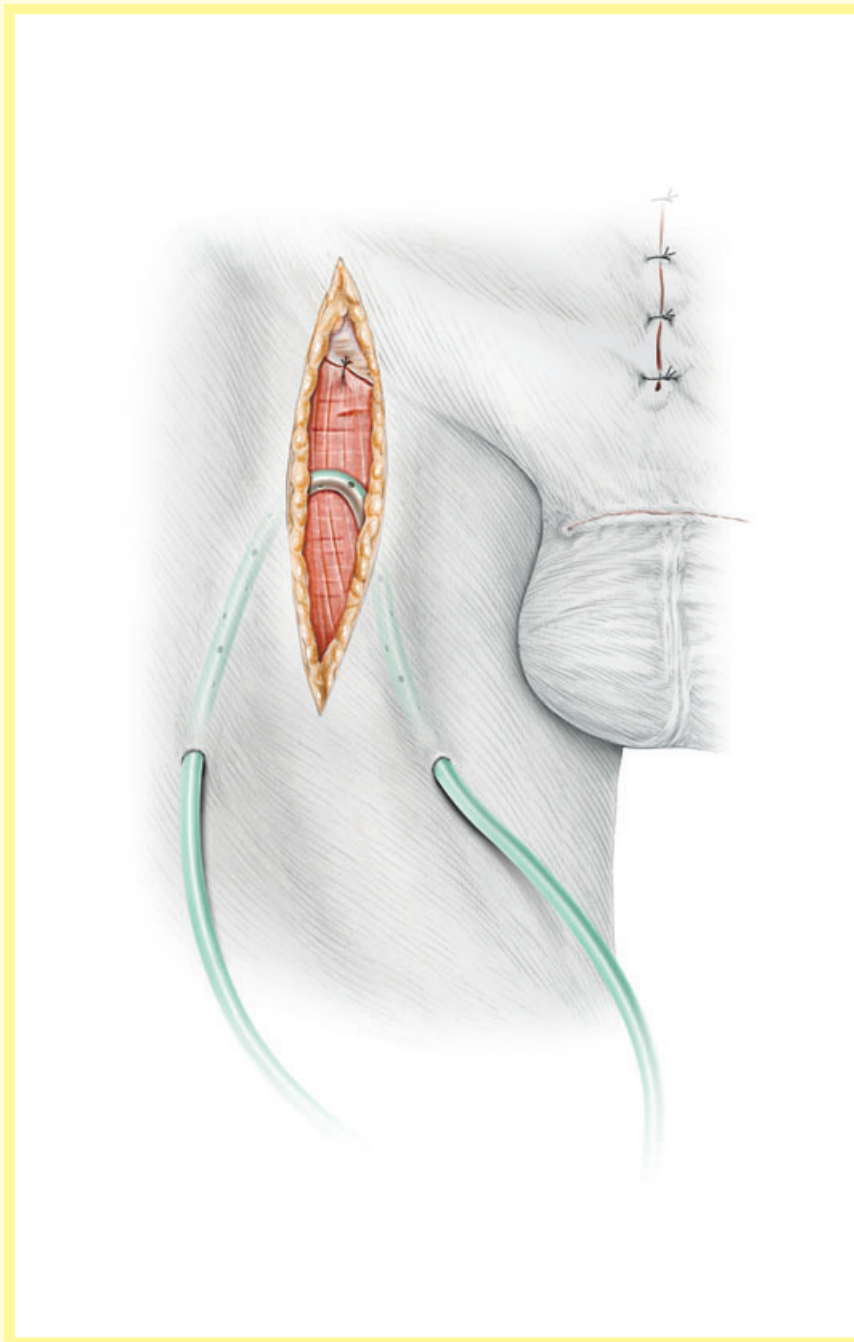
**Figure 5**

The femoral vein is a reliable landmark and as the nodal packet is developed, the femoral vein, artery and nerve are exposed.

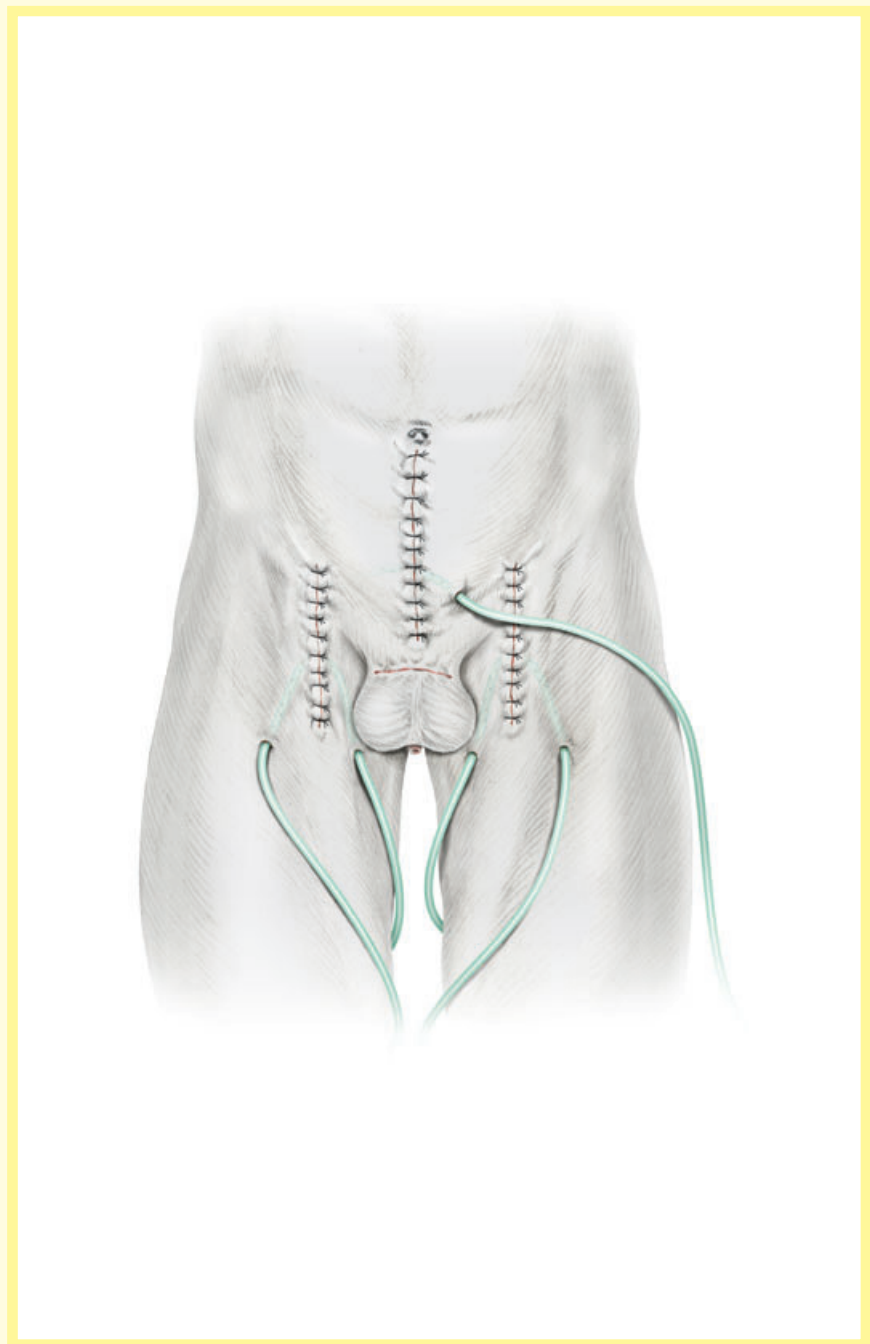
Figure 6

After the nodal packet has been delivered, the surgeon has the option of transferring the sartorius muscle from its attachment on the anterior iliac spine to the inguinal ligament.



**Figures 7 and 8**

After completing the node dissection, Hemovac drains are placed and the incisions closed. After an ilio-inguinal node dissection for bulky disease, and particularly in patients with ulcerative lesions, skin coverage is often required. Several types of myocutaneous flaps are reliable solutions to skin coverage in these circumstances. These include the tensor fascia lata, rectus abdominal muscle and gracilis muscle. The tensor fascia lata is based on an expendable muscle that abducts and rotates the thigh. The blood supply is based on the lateral circumflex artery. The rectus abdominis flap is based on the inferior epigastric vessels and can be harvested through the midline abdominal incision that is used for pelvic lymphadenectomy. Previous abdominal surgery sometimes compromises the inferior epigastric vessels and eliminates the rectus abdominis as a coverage option. A third alternative is the gracilis muscle, which is a minor abductor and the blood supply of which is based on the profunda femoral artery and the superficial femoral artery.



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POSTOPERATIVE CARE

The pneumatic stockings are kept in place whenever the patient is in bed during hospitalization and early ambulation is encouraged. Postoperative anticoagulation is not routinely used. Prophylactic antibiotics are continued for 1 week after surgery. The Hemovac drains are discontinued when the drainage is <25 mL/24 h. The patients are discharged with instructions to use elastic stockings.

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