

Surgery Illustrated – Surgical Atlas

Inguinal orchidectomy for testicular cancer

Giorgio Pizzocaro and Andrea Guarneri

Urologic Clinic Milan University, S. Giuseppe Hospital, Milan, Italy

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

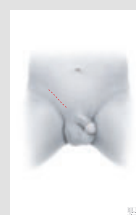
PLANNING AND PREPARATION

INDICATIONS

Inguinal orchidectomy (IO) is the standard indication for testicular cancer; 95% of testicular tumours are of germ-cell origin and with the exception of mature teratoma in children, they are all malignant. There is a large variety of non-germ cell tumours, the most frequent being malignant lymphomas and gonadal stromal tumours, especially Leydig cell tumours. The great majority of Leydig cell tumours are of benign behaviour, and most of them are treated with conservative surgery [1]. Conservative surgery is also allowed in monorchidic patients, usually for a contralateral second germ-cell tumour. Indications for conservative surgery are: Well-functioning residual testis and a cancerous nodule of <2 cm in maximum diameter, not close to the rete testis. Resection margins must be in healthy tissue and at least three marginal and one distant biopsy should be taken [2]. Postoperative radiotherapy (18–20 Gy in 2 weeks) is given to patients with concomitant carcinoma *in situ* [2].

PATIENT SELECTION

Every patient with diagnosed testicular cancer (elevated tumour markers and/or documented metastatic disease) is a candidate for IO. Patients with suspected testicular cancer undergo inguinal exploration and intraoperative diagnosis: The suspected testicle is exteriorized through the inguinal incision, the tunica vaginalis is opened and the testicle is inspected and palpated. If the diagnosis is not yet clear, a biopsy for frozen-section analysis is taken after protecting the operative field.



SPECIFIC EQUIPMENT AND MATERIAL

Routine surgical instruments are sufficient for standard IO. In the case of a small nodule, intraoperative ultrasonography equipment might be helpful and intraoperative frozen-section analysis must be available.

PATIENT PREPARATION

IO is an external operation and does not need specific preparation. The inguinal and the lower abdominal region, external genitalia and the upper thigh are shaved and cleaned before taking the patient to the operating room, and an anaesthesiological

premedication is given just before taking the patient to surgery.

PATIENT POSITIONING

The patient lies supine on the operating table. Some surgeons like to have the ipsilateral thigh lightly extra-rotated.

SURGICAL STEPS

Figure 1

A para-inguinal incision is made 2 cm above the inguinal fold from the pubic tubercle toward the superior anterior iliac spine. A 5–6 cm incision is usually enough.

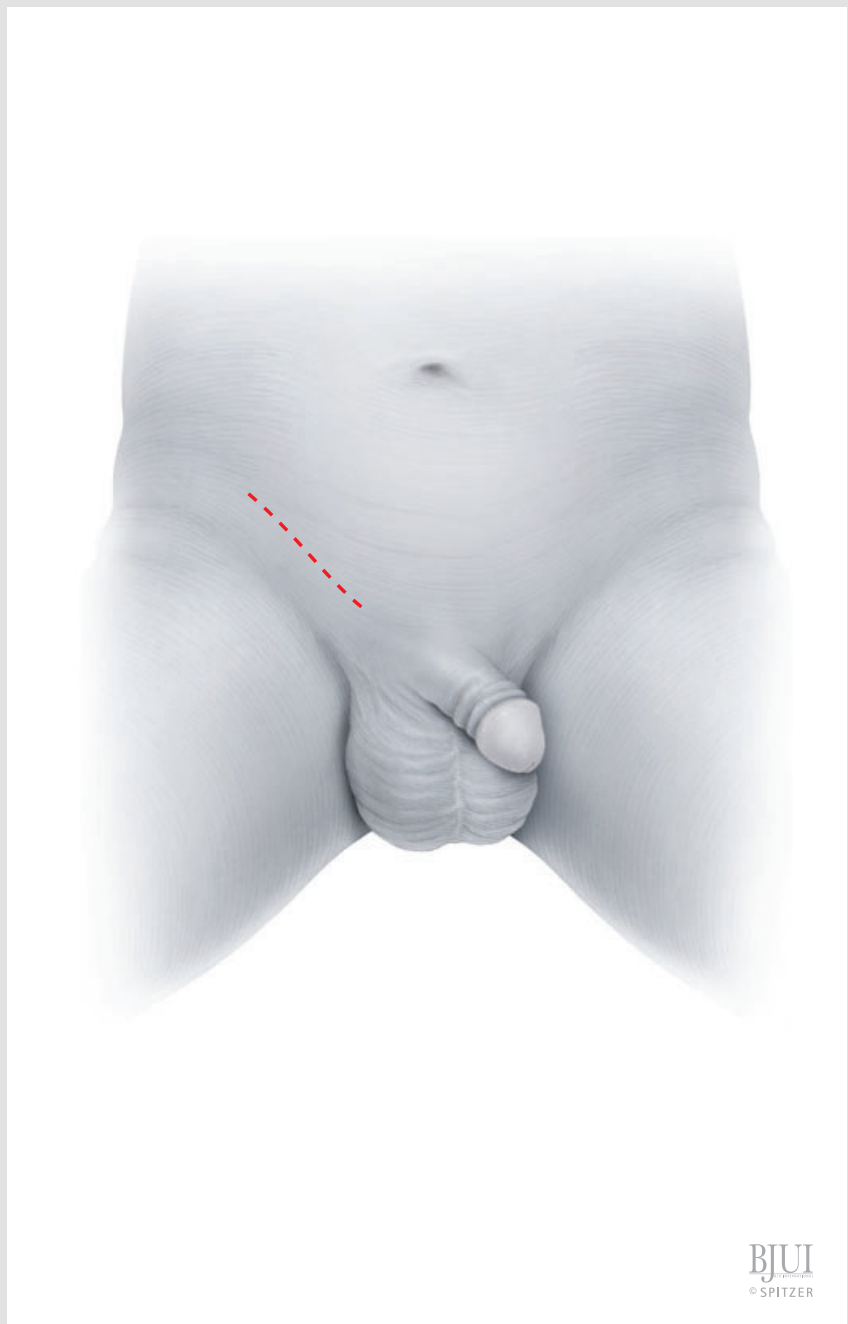
BJUI
© SPITZER

Figure 2

The spermatic cord is isolated at the external inguinal ring.

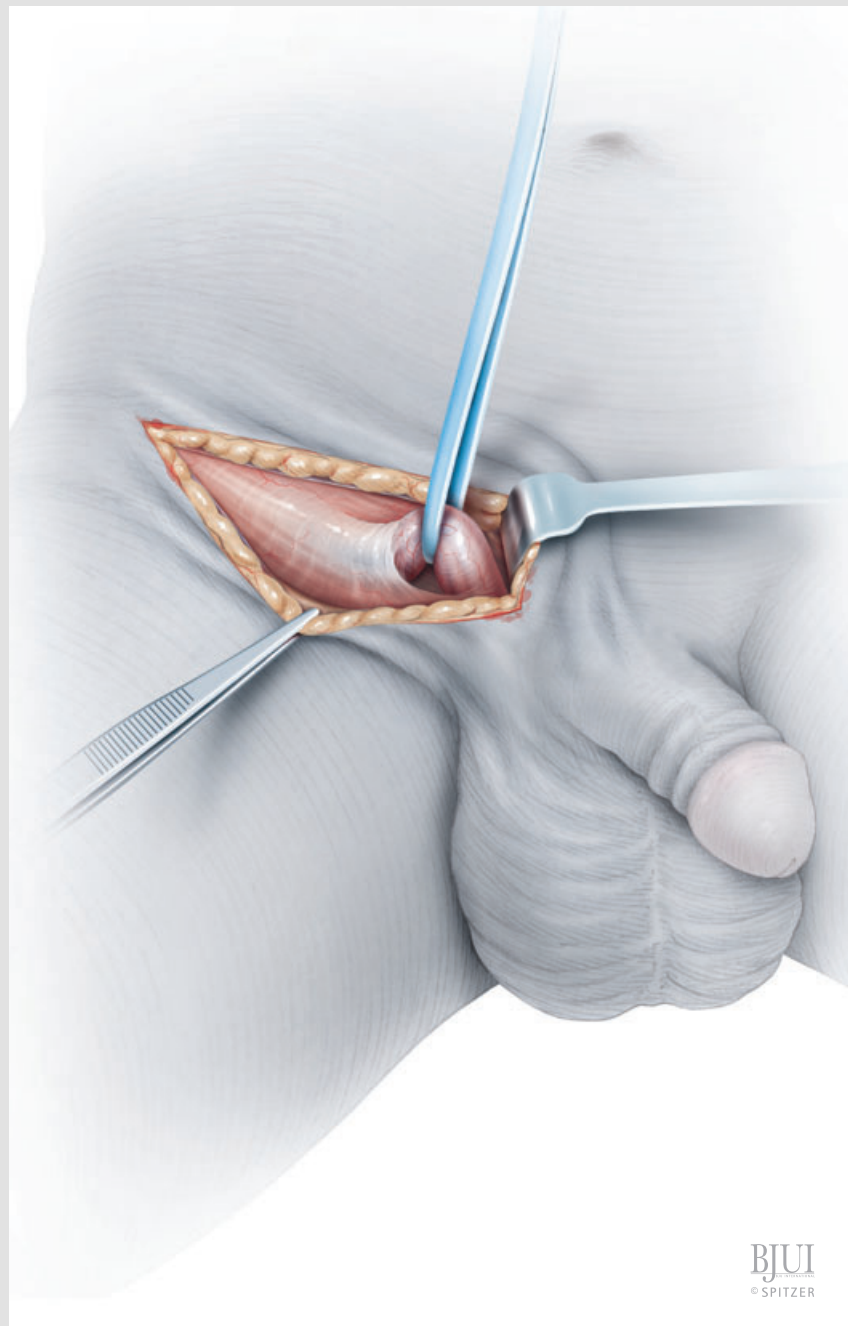


Figure 3

The index fingers of both hands are introduced along the spermatic cord down to the testicle to detach the scrotal skin from the distal spermatic cord and the proximal testicle in an avascular plane.

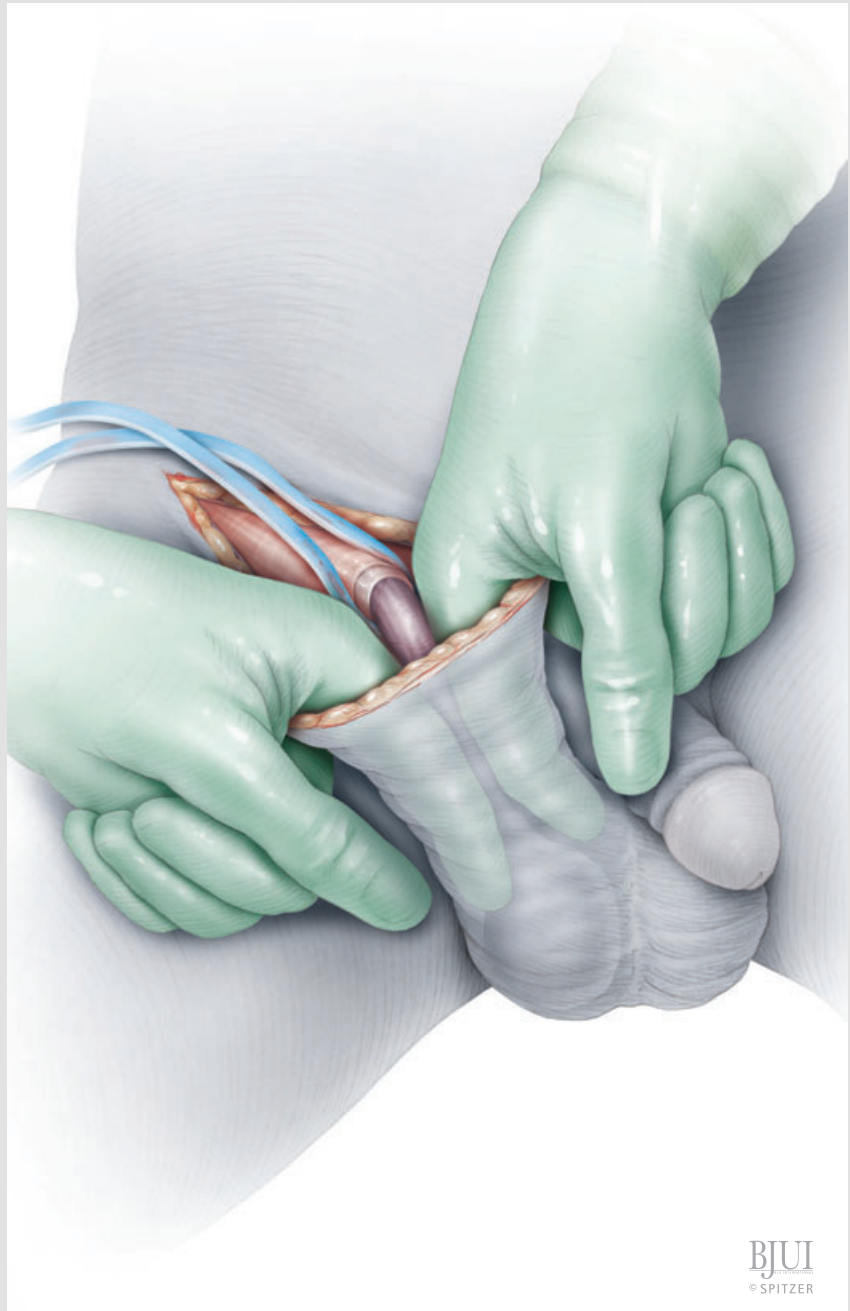
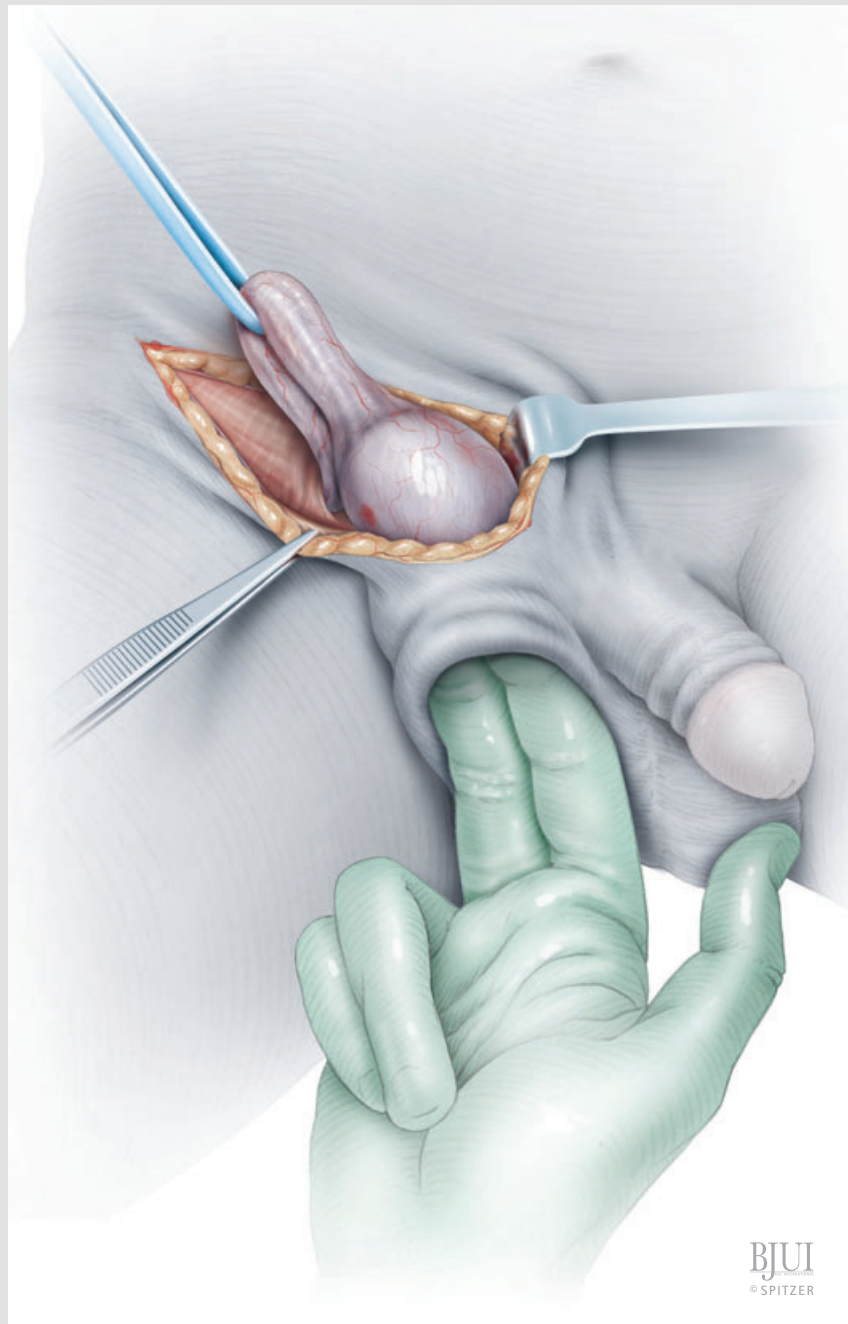
BJUI
© SPITZER

Figure 4

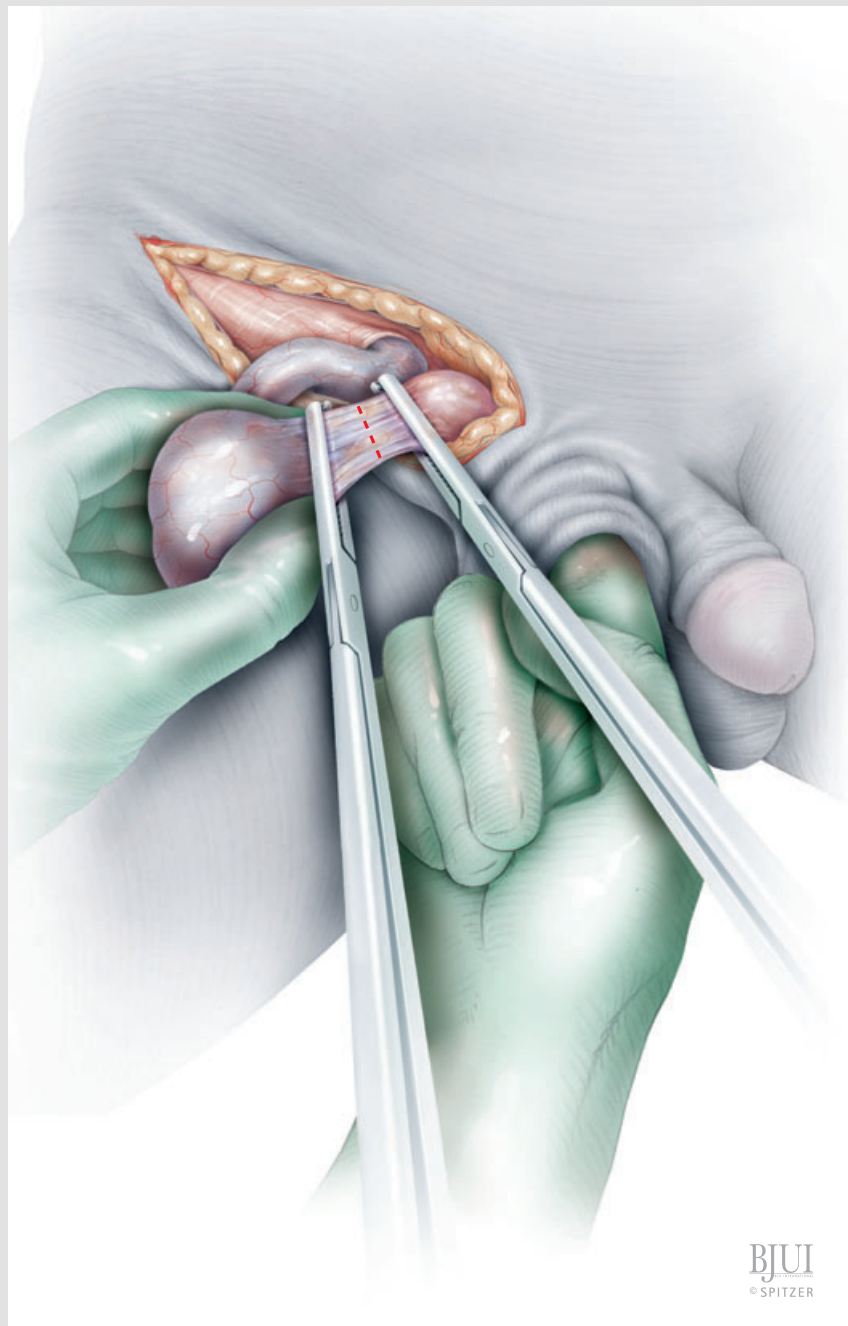
The testis, covered by its tunics, is brought outside the scrotum by a combined pushing of the testis from below and drawing of the spermatic cord upward.



BJUI
© SPITZER

Figure 5

The vaginoscrotal ligament, or gubernaculum testis, is divided and ligated. The testis is free and can be inspected and palpated carefully outside the inguinal incision.



BJUI
© SPITZER

Figure 6

If the diagnosis of testicular cancer is uncertain, the operative field is protected with surgical sponges, the spermatic cord is clamped and a biopsy is taken for intraoperative frozen-section histological analysis.

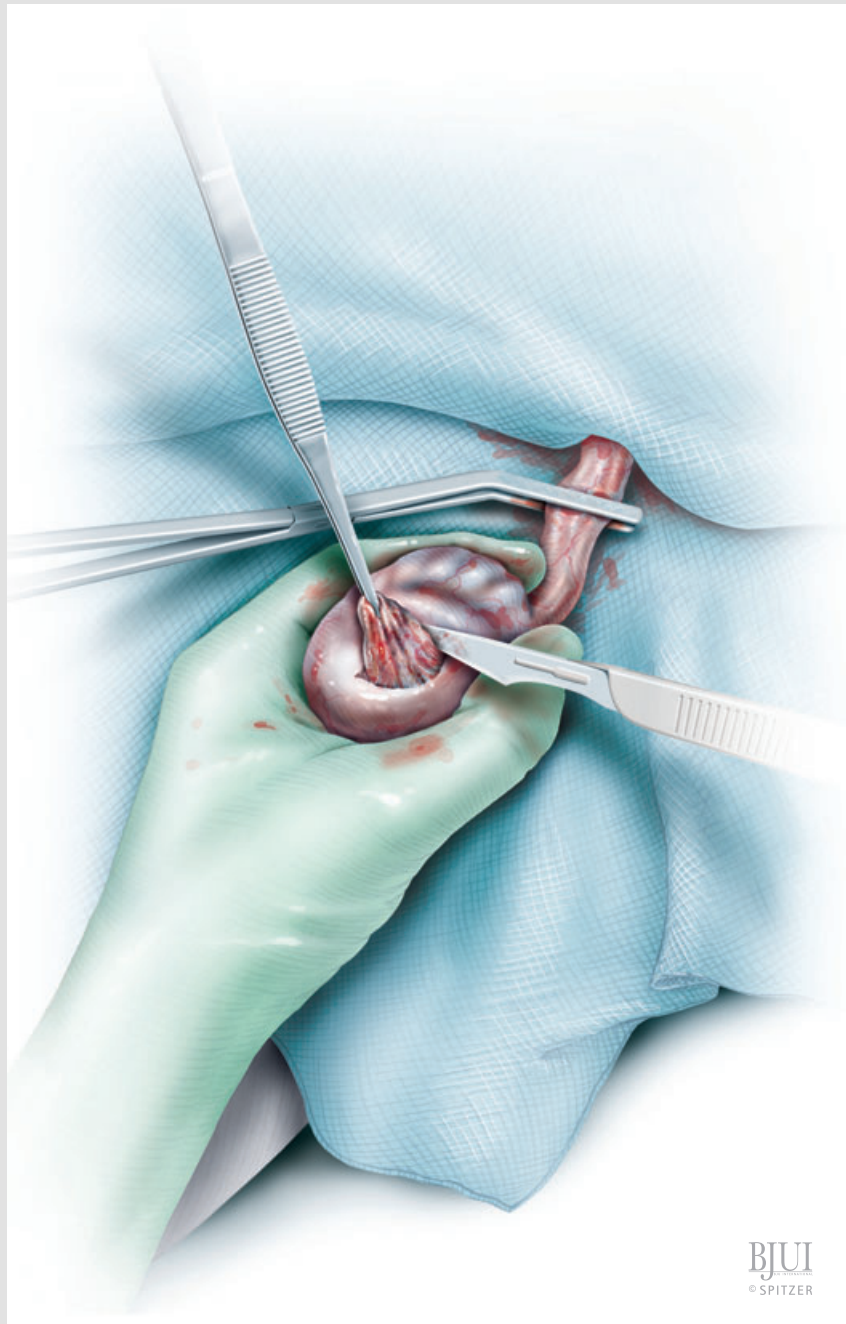


Figure 7

Once the diagnosis of testicular cancer is assured, the testis is wrapped in surgical sponges, the inguinal channel is opened, cutting the fascia of the external oblique muscle over the underlying spermatic cord structures. The ilioinguinal nerve is encountered, usually slightly lateral to the cord; it must be carefully mobilized and protected during the remainder of the dissection.

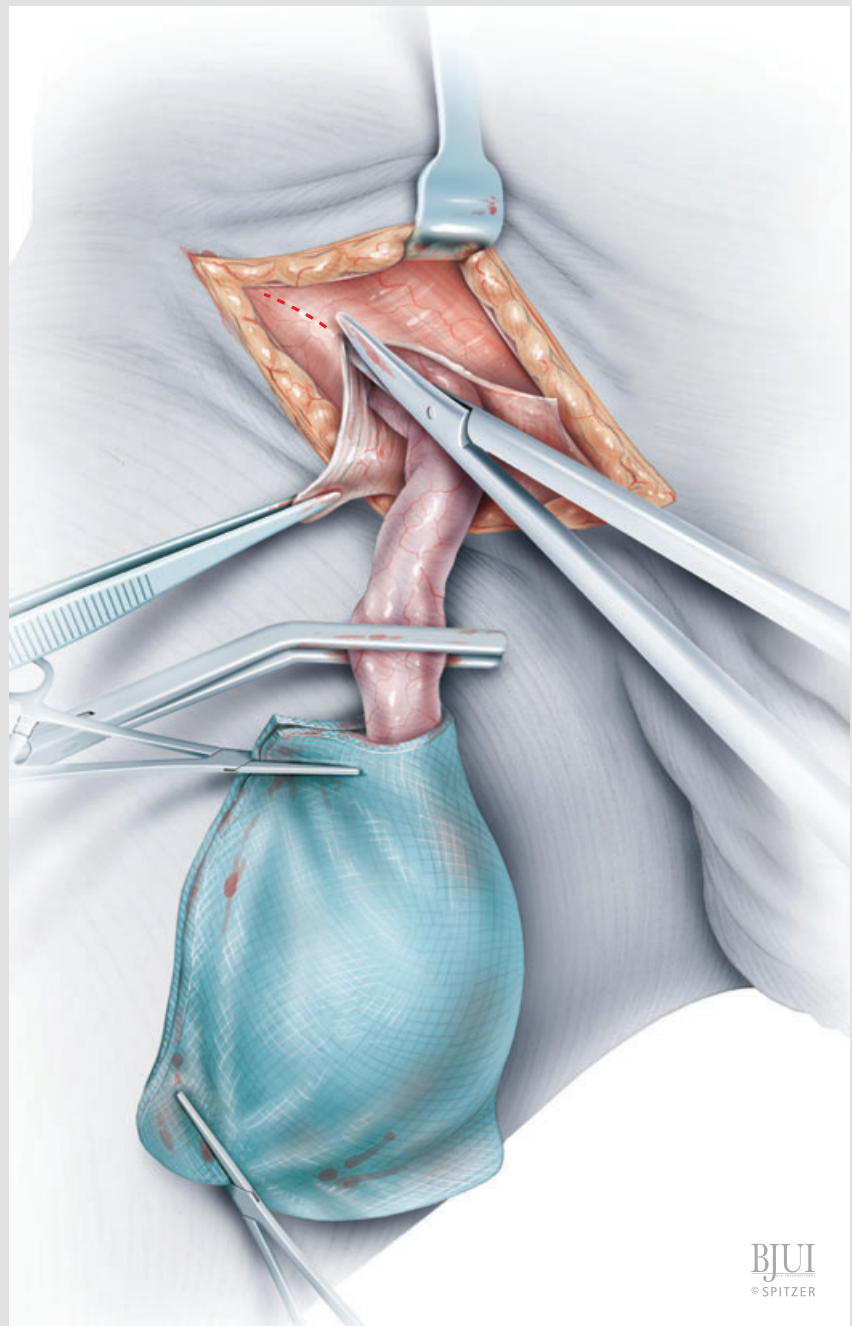
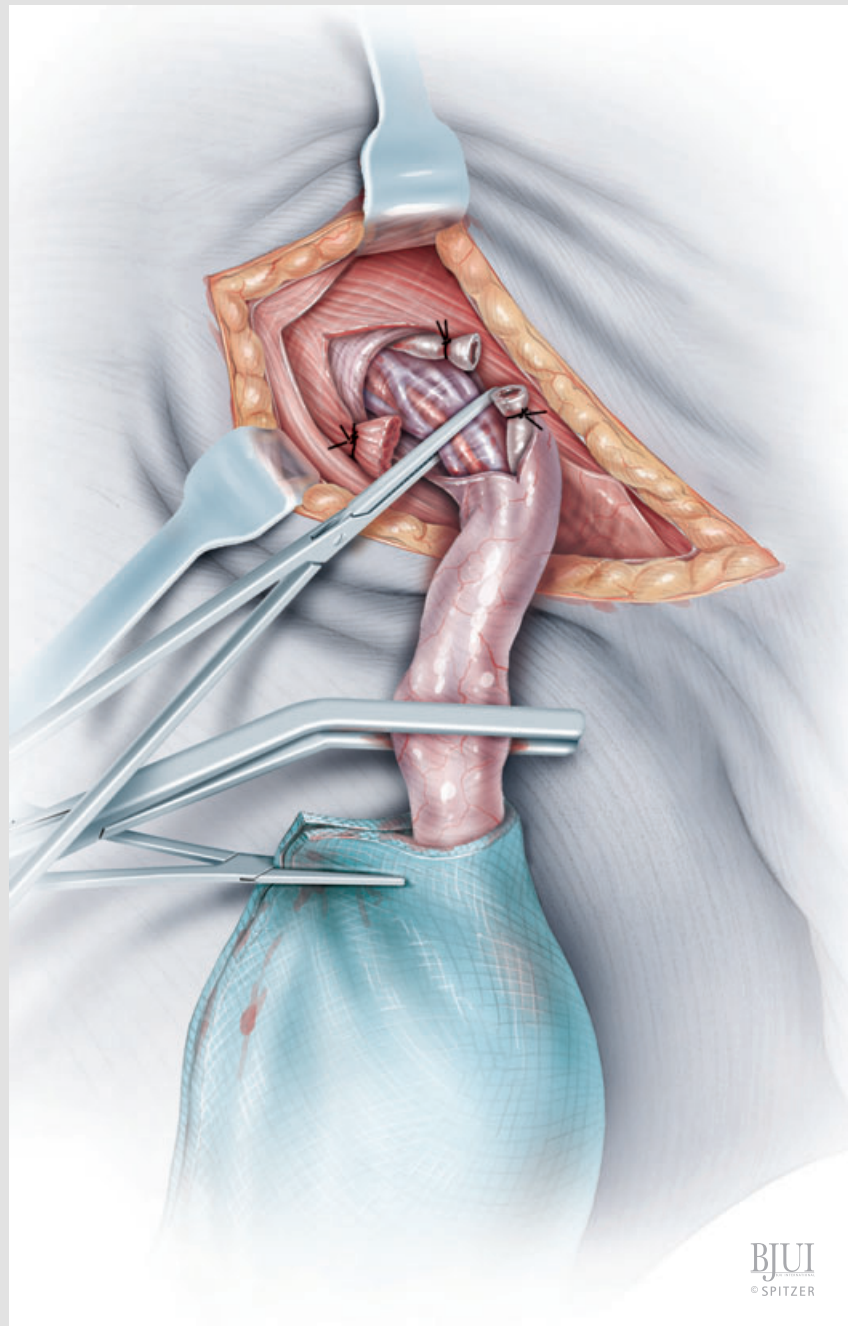
BJUI
© SPITZER

Figure 8

The cord is mobilized until the internal ring and its elements are securely ligated. The vas deferens, the cremasteric muscle and the testicular vessels are ligated as high as possible in order that they can retract inside the retroperitoneal space.



HIGHLIGHTS

IO AFTER ORCHIDOPEXY

Dissection of the spermatic cord is usually difficult; the aponeurosis of the external oblique muscle is a hard scar very adherent to the cord. Dissection must be very careful, to avoid vascular injury to the spermatic vessels, especially at the passage into the retroperitoneum, where the spermatic cord is very adherent to the internal inguinal ring.

IO AFTER EVERSION OF THE TUNICA VAGINALIS

Patients who have had eversion of the tunica vaginalis have the scrotum strictly adherent to testicular albuginea and dissection must be done very carefully to minimize bleeding and avoid to damage both skin and testis.

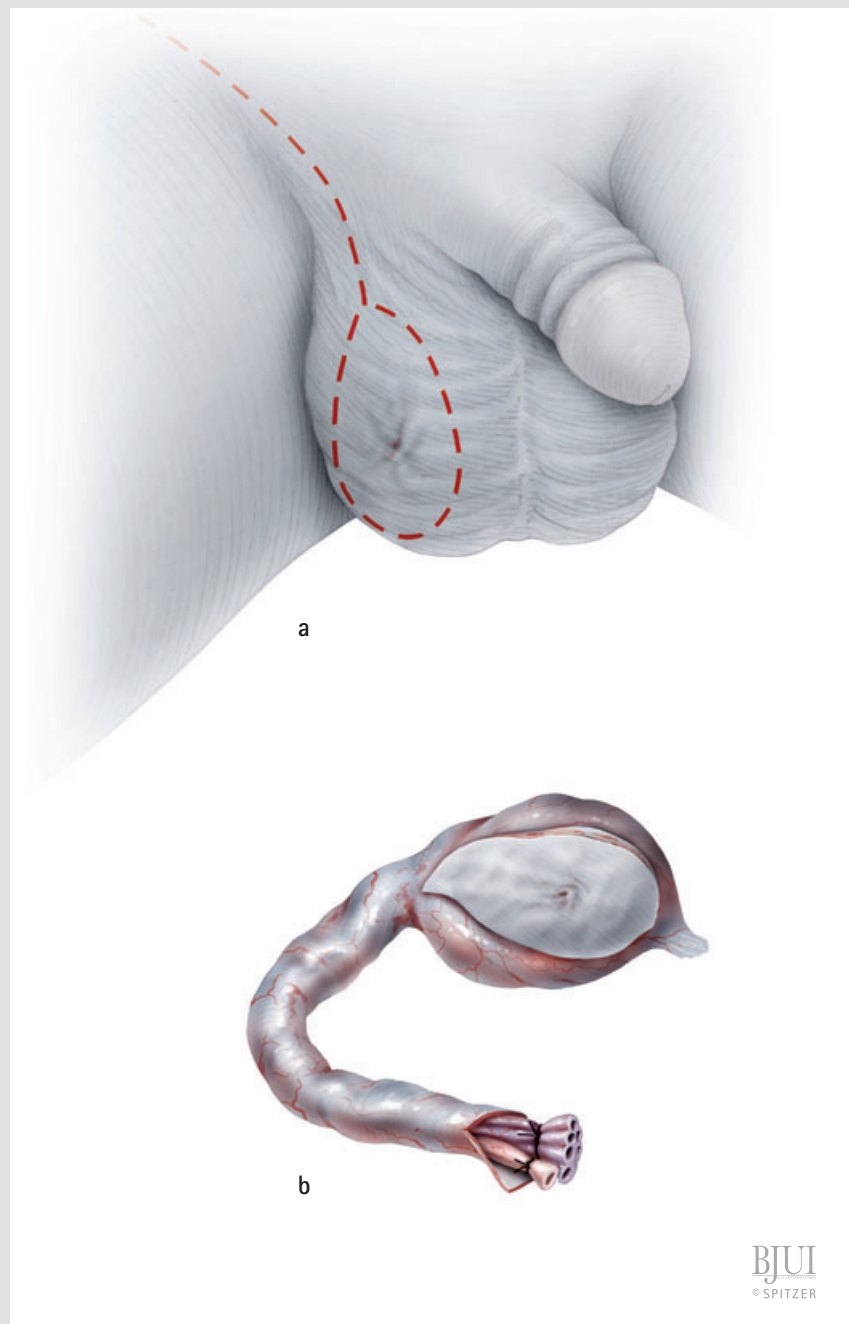
SCROTAL VIOLATION

Figure 9

Transcrotal testicular biopsy needs a radical IO en bloc with the scrotal skin containing the scar. A transcrotal orchidectomy needs radicalization; excision of the scrotal scar en bloc with the spermatic cord up to the internal inguinal ring.

SPECIFIC MATERIAL

The only specific materials required are testicular prostheses. They should have the same form, size and consistency of the healthy contralateral testicle. Before choosing the prosthesis, the opposite healthy testicle is measured. If the prosthesis is positioned during IO it is to be put as deep as possible into the empty scrotal sac, to avoid the scar process drawing the prosthesis upward. If the prosthesis is put in the scrotal sac after IO it can be correctly positioned through a small scrotal incision.



BJUI
© SPITZER

POSTOPERATIVE CARE

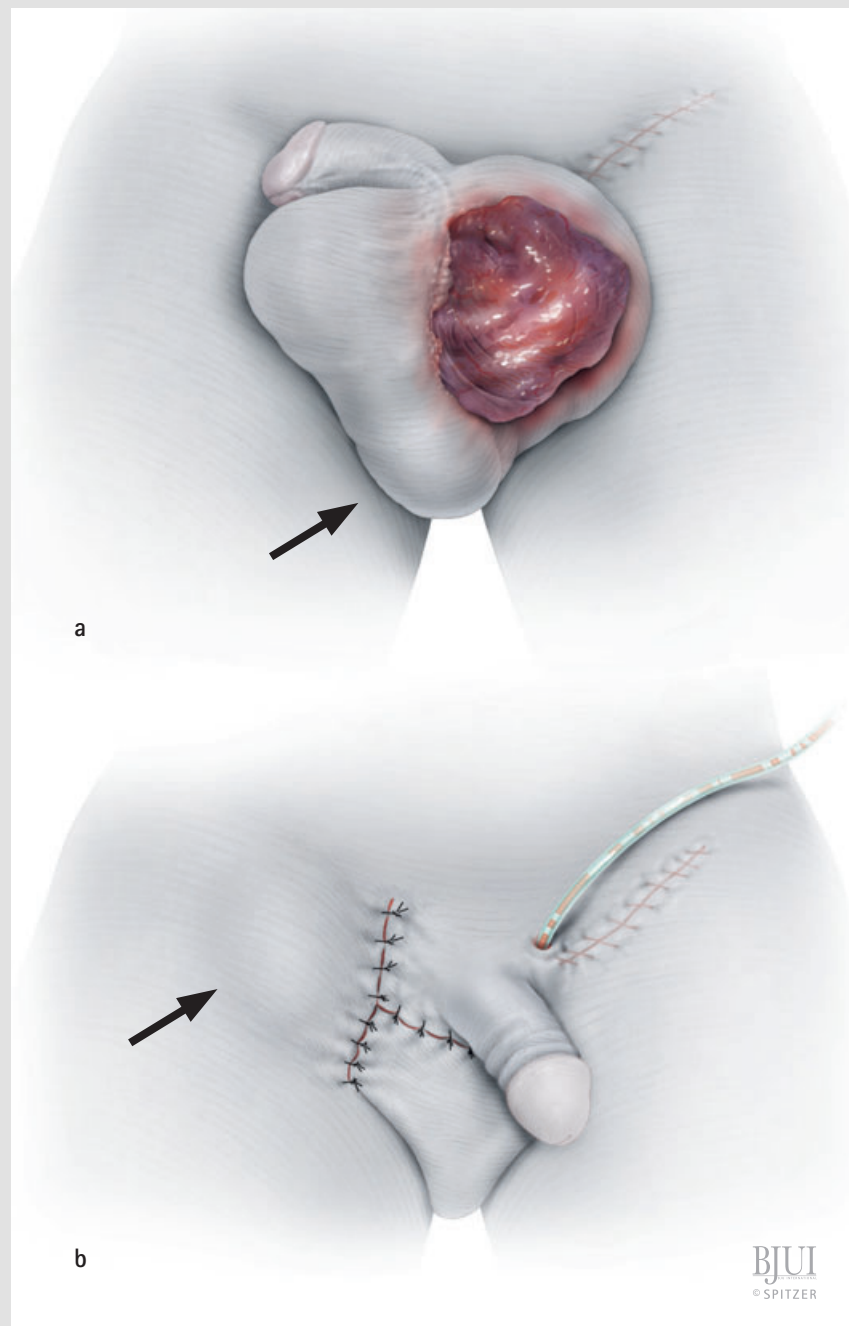
Dressing is very simple, even if the scrotum was resected for scrotal violation. Sutures are removed after 1 week. No specific medication is necessary. Routine antibiotic coverage is given, especially in patients who have had a difficult scrotal surgery.

The patient is mobilized immediately after surgery if it was done under local anaesthesia. For patients who had peridural or general anaesthesia, the full recovery from anaesthesia is awaited. Patients who were not mobilized early usually develop some degree of rigidity in the groin and they need immediate assisted active mobilization. They must walk normally.

No catheter nor adjuvant medication is necessary. No drainage is used for standard IO; it can be used in a very few particular cases.

FROM SURGEON TO SURGEON

The difficult case (Figure 10); occasionally a patient presents with a cancerous testis so increased in size as to invade the opposite site of the scrotum and ulcerate the skin. This patient had an unsuccessful inguinoscrotal hernia repair elsewhere which was limited to the removal of the spermatic cord. It was necessary to remove the entire scrotum en bloc with the tumoral testis and put the opposite healthy testicle in a subcutaneous pocket in the groin. The arrow indicates the contralateral testis.



No specific instruments or positions are necessary: Routine inguinoscopy adapted to the particular situation is all that is required. Our personal worst case is that described above. If there is lymphangitic infiltration along the spermatic cord, nothing changes. The cord is divided at the internal inguinal ring as usual and the patient commences chemotherapy as soon as the final histological examination is ready. Testicular malignant lymphomas are very similar to seminoma both at surgery and frozen-section analysis, but the medical treatment is completely different!

Our simple helpful suggestion is to avoid anxiety. If any accident happens during surgery, stop, put a finger over the

problematic point, clean around the operative field, be rational and logical, and make the simplest decision.

The most severe intraoperative problems during IO are retraction of untied spermatic vessels into the retroperitoneum, and tumour spillage. For retraction of untied spermatic vessels it is necessary to divide the abdominal muscles upward until the vascular vessels are seen and ligated (the haemorrhage ceases with pressure in the retroperitoneal space). Tumour spillage is prevented with gentle handling and avoiding excessive pressure. If it should occur, the area must be thoroughly washed with distilled water and postoperative chemotherapy is mandatory.

REFERENCES

- 1 **Carmignani L, Colombo R, Gadda F *et al.*** Conservative surgical therapy for Leydig cell tumor. *J Urol* 2007; **178**: 507–11
- 2 **Weissbach L.** Organ preserving surgery of malignant germ cell tumors. *J Urol* 1995; **153**: 90–3

Correspondence: Giorgio Pizzocaro, Urologic Clinic Milan University, San Giuseppe Hospital, Via S. Vittore 12, Milan 20122, Italy.
e-mail: pizzocaro@iol.it

Abbreviation: **IO**, inguinal orchidectomy.