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Surgery Illustrated – Surgical Atlas
Adult hydrocele and spermatocele

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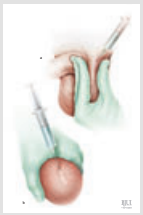
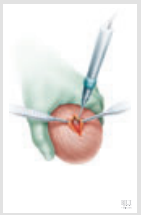
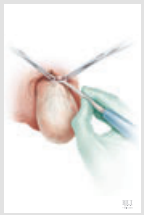
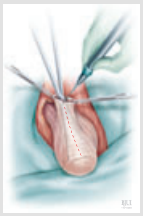
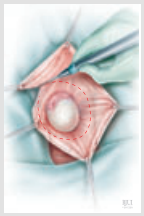
INTRODUCTION

The terminologies hydrocele and spermatocele refer to abnormal collections in the testis within the scrotal sac. Although the aetiologies differ, both may require surgical repair. Both pathologies must be included in the differential diagnosis of scrotal masses.



ADULT HYDROCELE

Hydrocele comes from the Greek *hydros* (water) and *kele* (mass). It is an abnormal collection of fluid in the tunica vaginalis that may surround the testicle.

During the first third of pregnancy, the testicle migrates from the abdomen (lumbar region), through the inguinal canal from the internal ring to the external ring, out into the scrotum. This involves an extension of the peritoneum: the peritoneum-vaginal conduit (processus vaginalis). Usually this conduit closes during the first year of life, at the same time it divides into two different virtual cavities, peritoneal and vaginal. The vaginal cavity is a serous-lined cavity made up of a parietal layer that covers the internal scrotal wall and the visceral layer that adheres to the testicular albuginea [1].

In the adult, a hydrocele is an accumulation of excessive secretion of the vaginal mucosa; exudates collect in the non-communicative vaginal cavities. In the young adult, a communicative hydrocele must be excluded, as its treatment is similar to paediatric herniorrhaphy.

Surgical treatment is the gold standard for adult hydrocele. Although it is an easy

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procedure, its simplicity can hide traps that may lead to both a complicated recovery and postoperative period.

PRE-SURGICAL CARE AND SURGICAL INDICATION

Although hydrocele diagnosis is clinical, a scrotal ultrasound is useful to exclude possible hidden testicular and epididymal pathology. Hydrocelectomy is inappropriate in cases of testicular neoplasm.

Surgical treatment is indicated when functional problems are present such as pain, discomfort or disability due to the size, but not for aesthetics only.

The patient must be informed of all potential complications, including testicular loss and fertility alterations.

Figure 1

ANAESTHESIA AND SURGICAL EQUIPMENT

Anaesthesia is usually general or loco-regional. The procedure can be done under local anaesthesia, which must be combined with pre-medication (oral diazepam or i.m. morphine) [2]. The spermatic cord is localized where it leaves the external inguinal ring, and is held against the pubic bone. Local infiltration is applied with 1% lidocaine (7–10 mL) (Fig. 1a). Local anaesthesia is completed with 5–7 mL intradermal infiltration at the site of incision (Fig. 1b).

Standard surgical equipment is required and eight Allis forceps for the Lord technique.

Bipolar forceps may help in coagulation and diminish 'electrical trauma' in the testis.

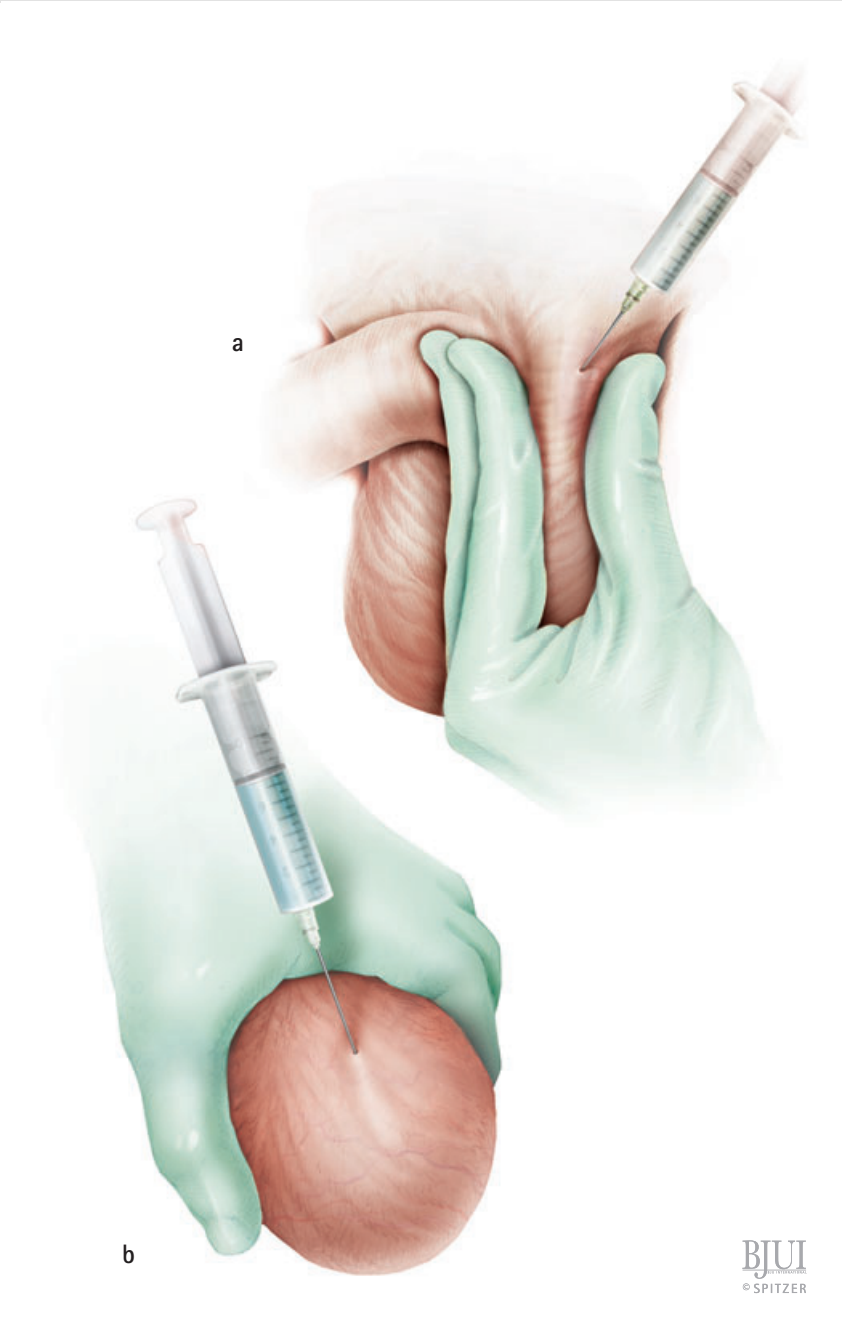


Figure 2

SURGICAL TECHNIQUE

Various surgical techniques are used to treat hydrocele. The scrotum and penis are shaved and the entire area cleaned with antiseptic. The approach can be either midline scrotal or transverse between running blood vessels. Midline is more appropriate for bilateral hydrocele, and transverse is safer for local anaesthesia.

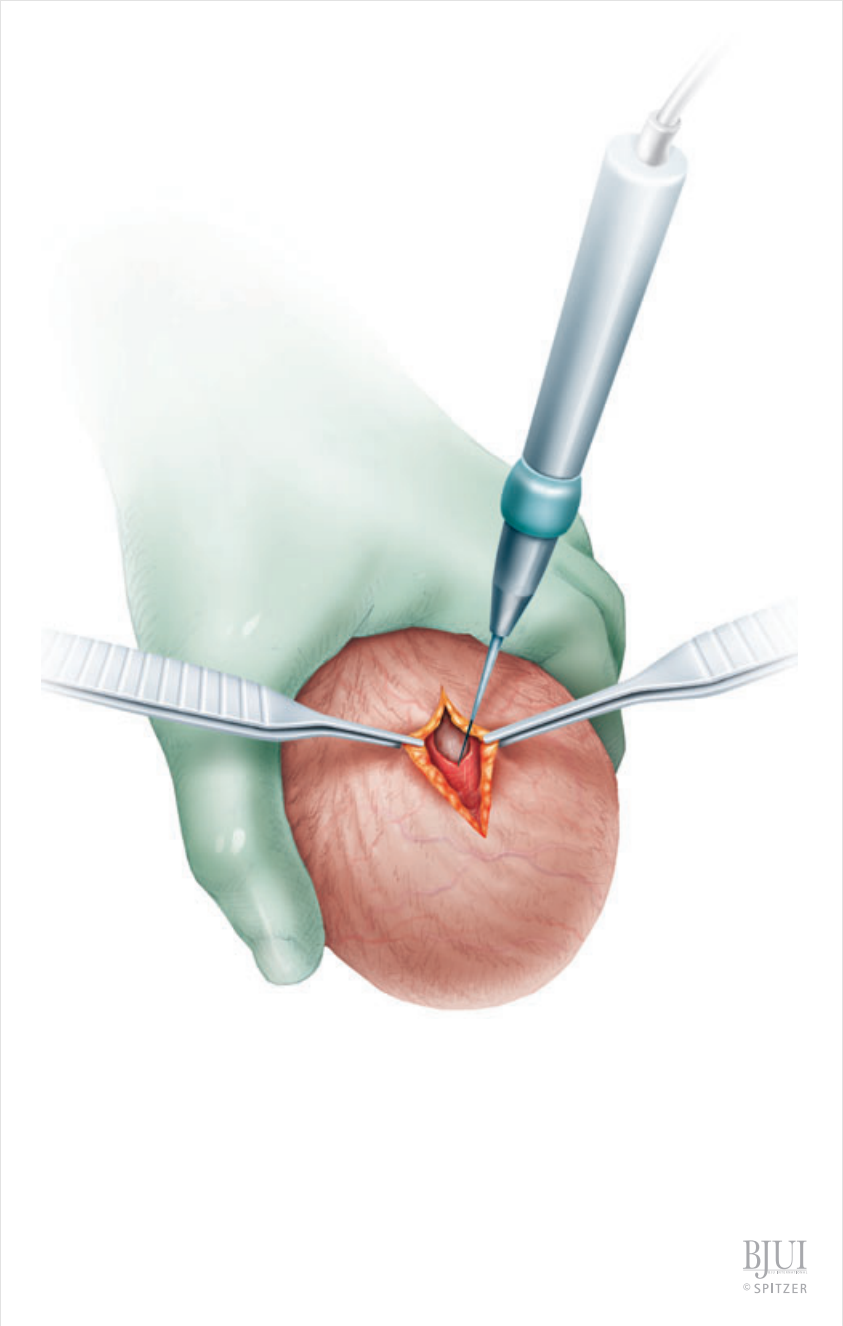
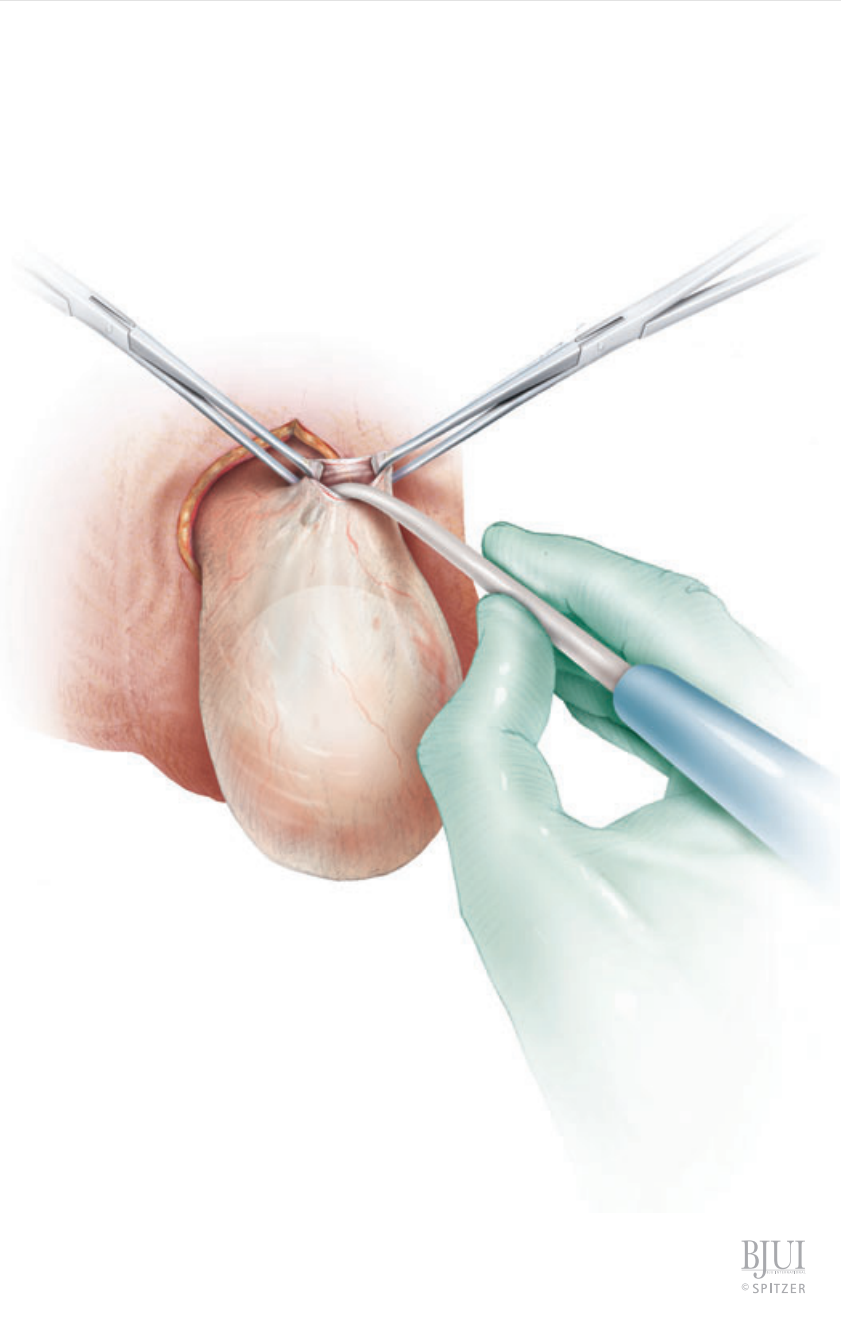


Figure 3

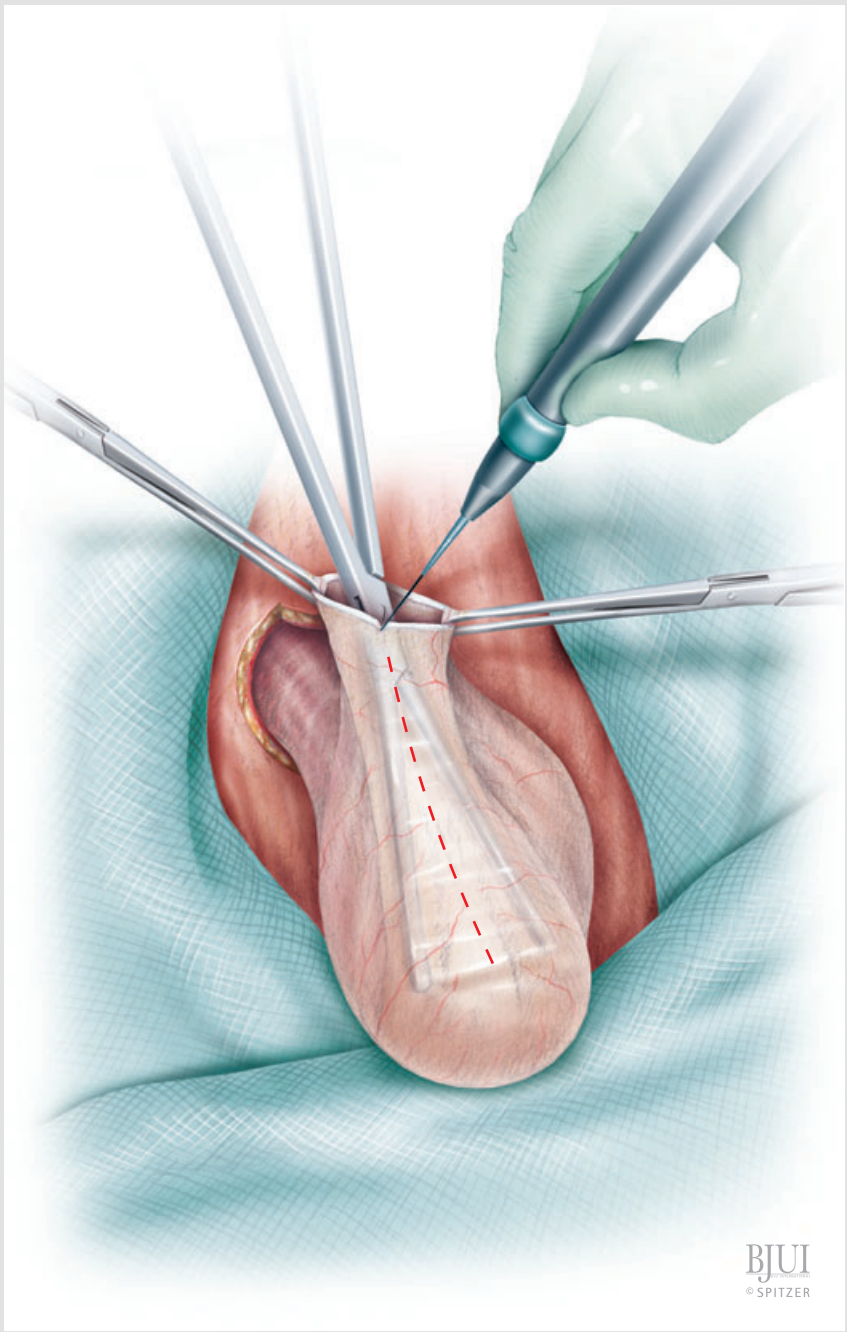
A small skin incision is usually made for all techniques and the testis is pulled out entirely. If local anaesthesia is used, lumbar pain (colic) at this moment may be experienced and is due to traction on the vessels [1,3].

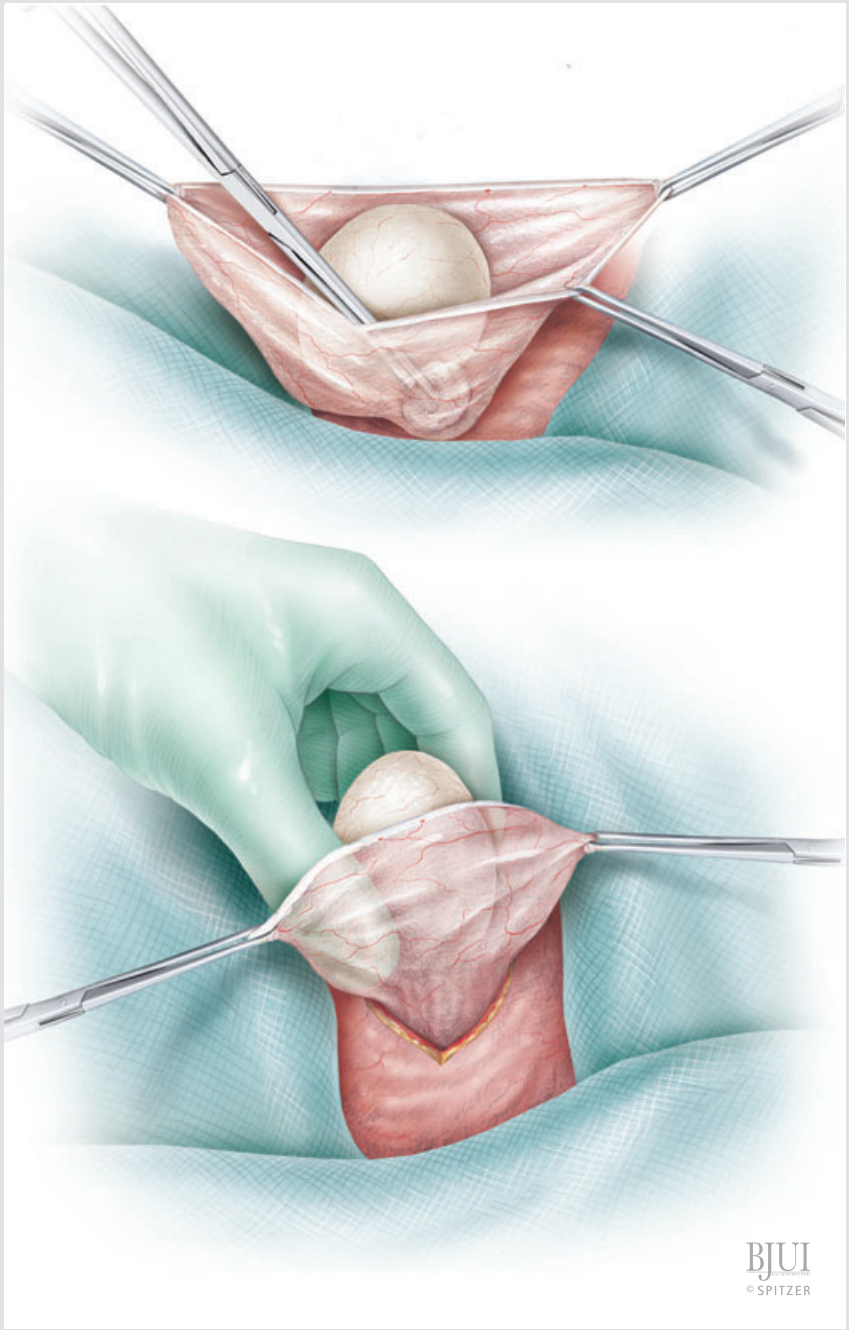


Figures 4–6

ANDREWS PROCEDURE

The Andrews procedure is usually referred to as the 'bottle' operation. The testicle is delivered through a 2–3-cm incision in the tunica vaginalis, everting the hydrocele around the testicle. The procedure might be completed by tacking the cut edges around the cord structures or leaving the everted sac open. Two-layer closure is then accomplished [1].





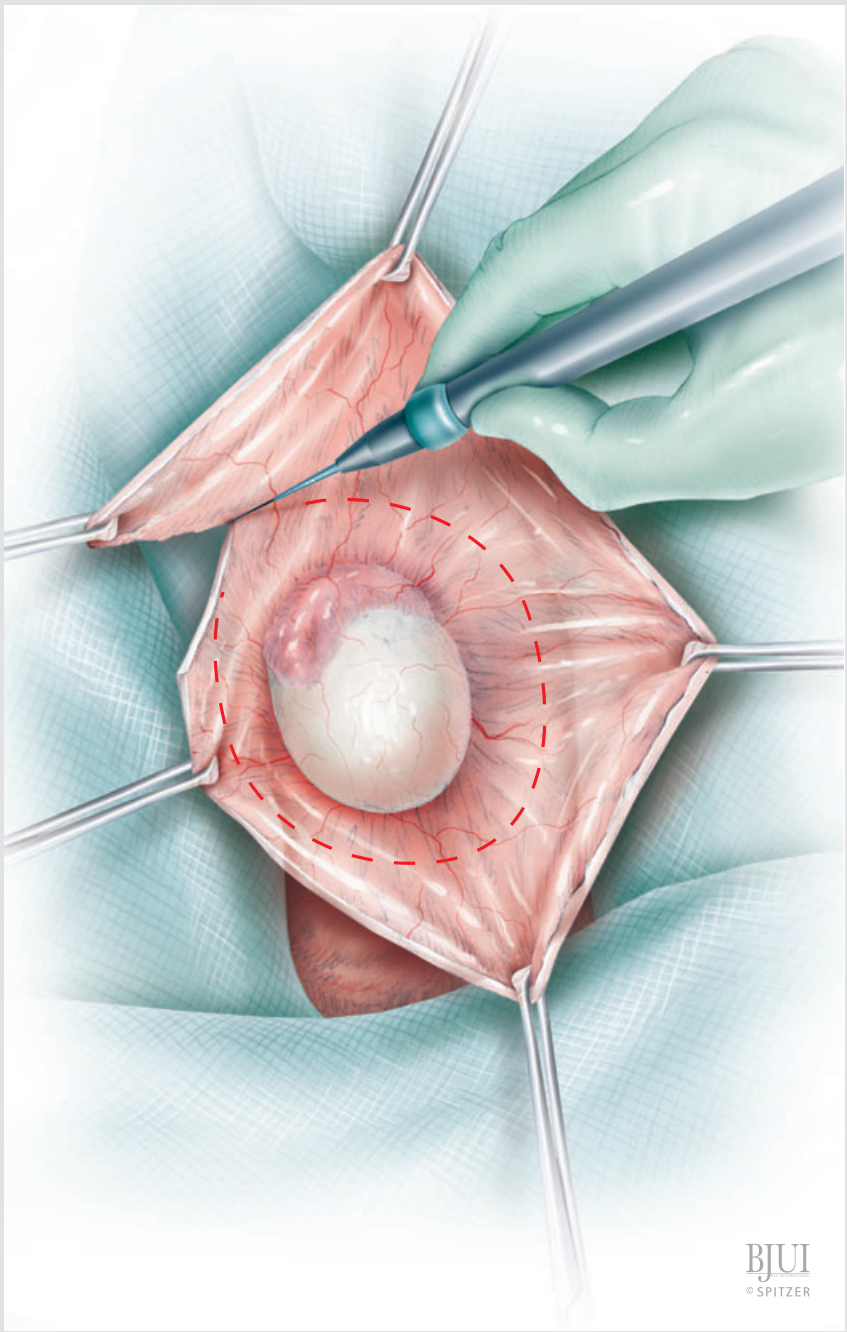


Figure 7

JABOULAY OR WINKLEMAN PROCEDURE

After delivering the testis through an incision in the tunica, most of the sac is then resected, leaving a small cuff along the borders of the testicle. After everting the remnant, bleeding may be rapidly controlled by a running suture closing the free edges around the cord structures. Approximation of the edges is done loosely around the cord to avoid compromising the blood supply to the testicle [4]. In another variation of this technique, the parietal tunica vaginalis is resected close to the testicle and epididymis [5]. Electrocautery may be used around the edge to aid haemostasis. Standard two-layer closure is used to close the scrotum (**Fig. 2–7**).

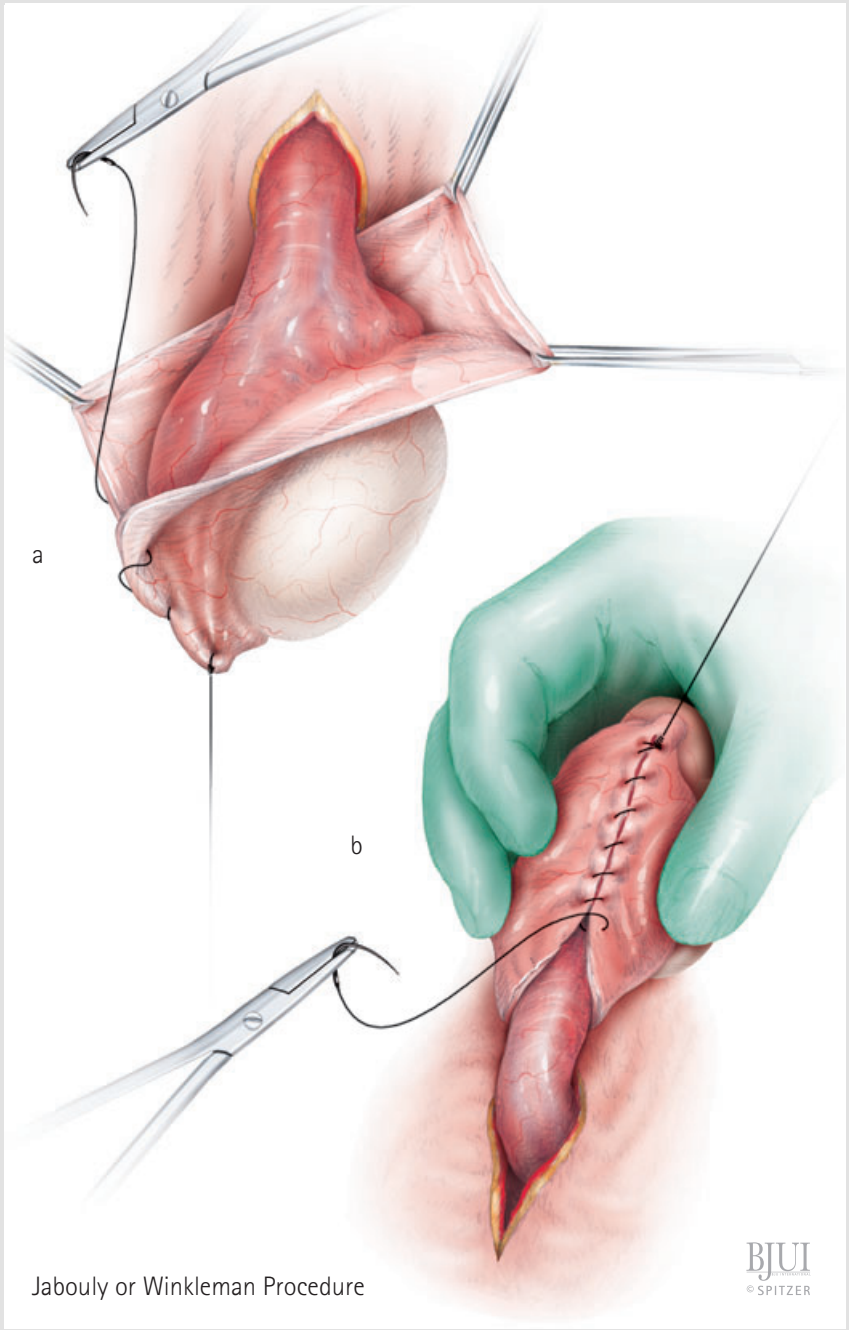


Figure 8

LORD PROCEDURE

When using this technique, a small incision in the scrotum is required, just large enough to deliver the testicle into the operative field. The parietal layer of the tunica vaginalis is opened without dissection from the Dartos layer. Allis forceps on the cut edges allow the testicle to be brought into the wound. Next, the edges are plicated circumferentially with interrupted absorbable 2–0 or 3–0 sutures, placing them ≈1 cm apart, with 'bites' 1 cm wide as well. When tying these sutures the result must look like a Spanish collar around the epididymis and the testis. Wound closure is performed as described for other procedures (**Fig. 9**) [6].

DRAINAGE, CLOSURE, DRESSING AND POSTOPERATIVE CARE

All these procedures can be performed without surgical drainage, but when haemostasis or a large hydrocele is drained, a Penrose drain placed through a separate stab incision in the lower pole and left over might be useful.

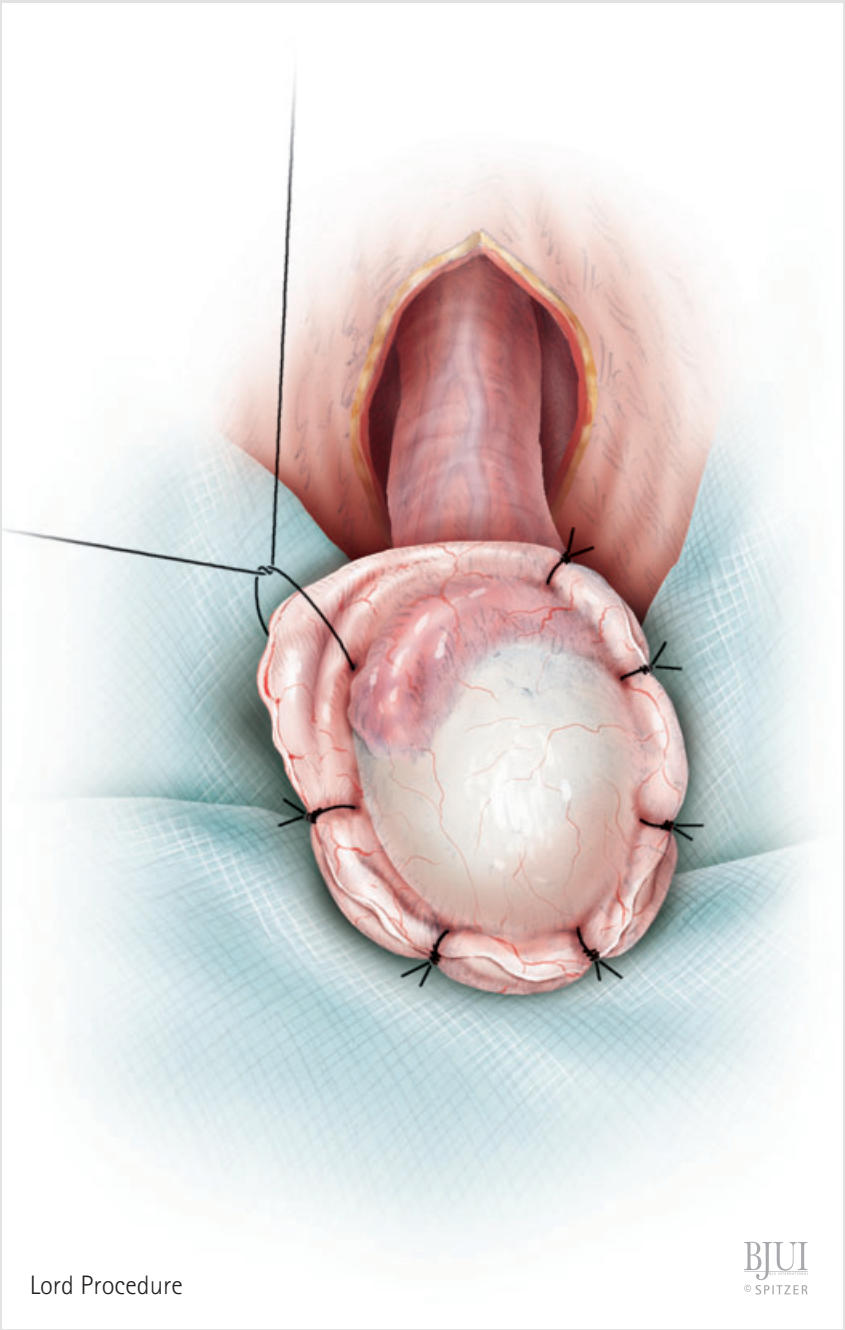
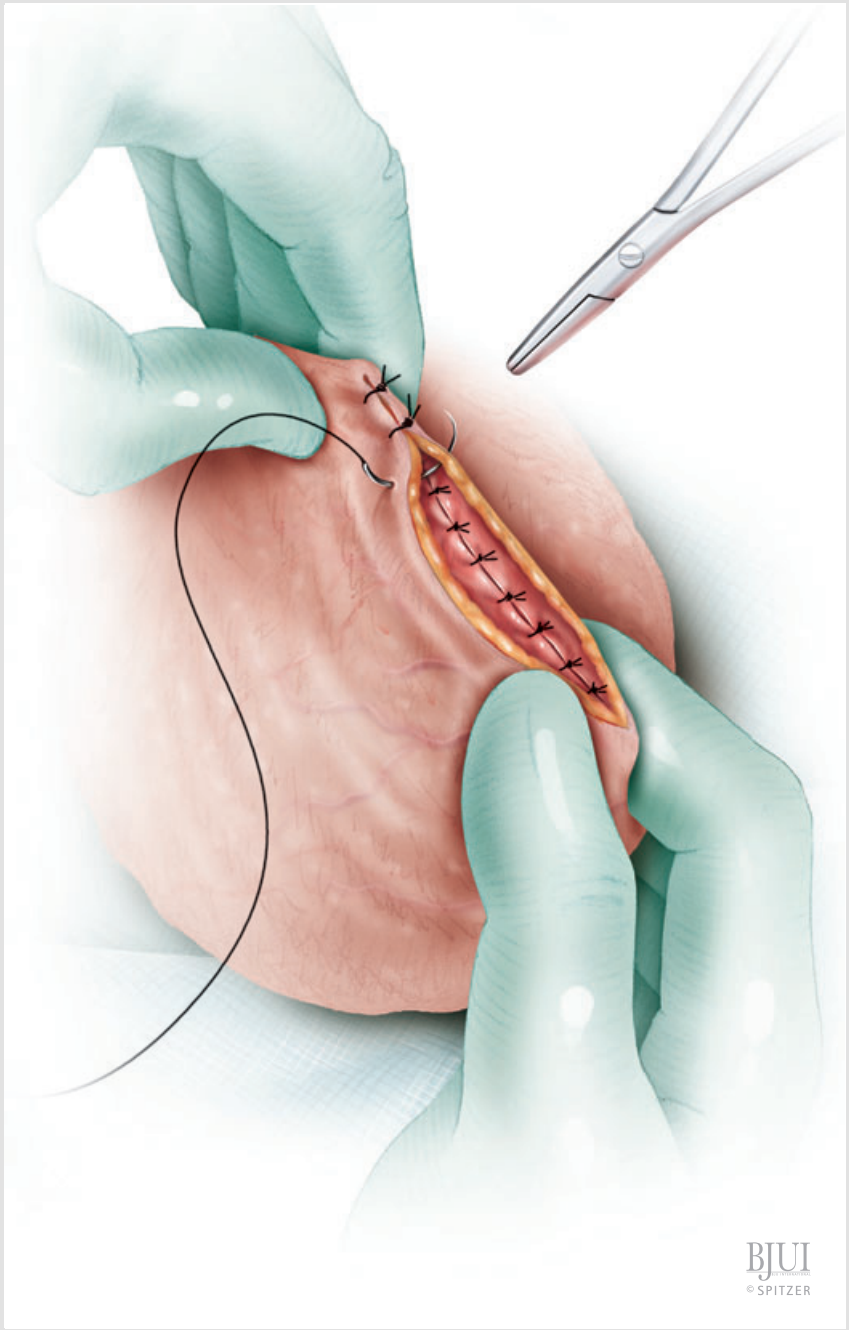


Figure 9

Two-layer closure is mandatory, the first including the Dartos muscle and the second for the skin. Simple stitches or 'mattress' stitches are better for haemostasis.



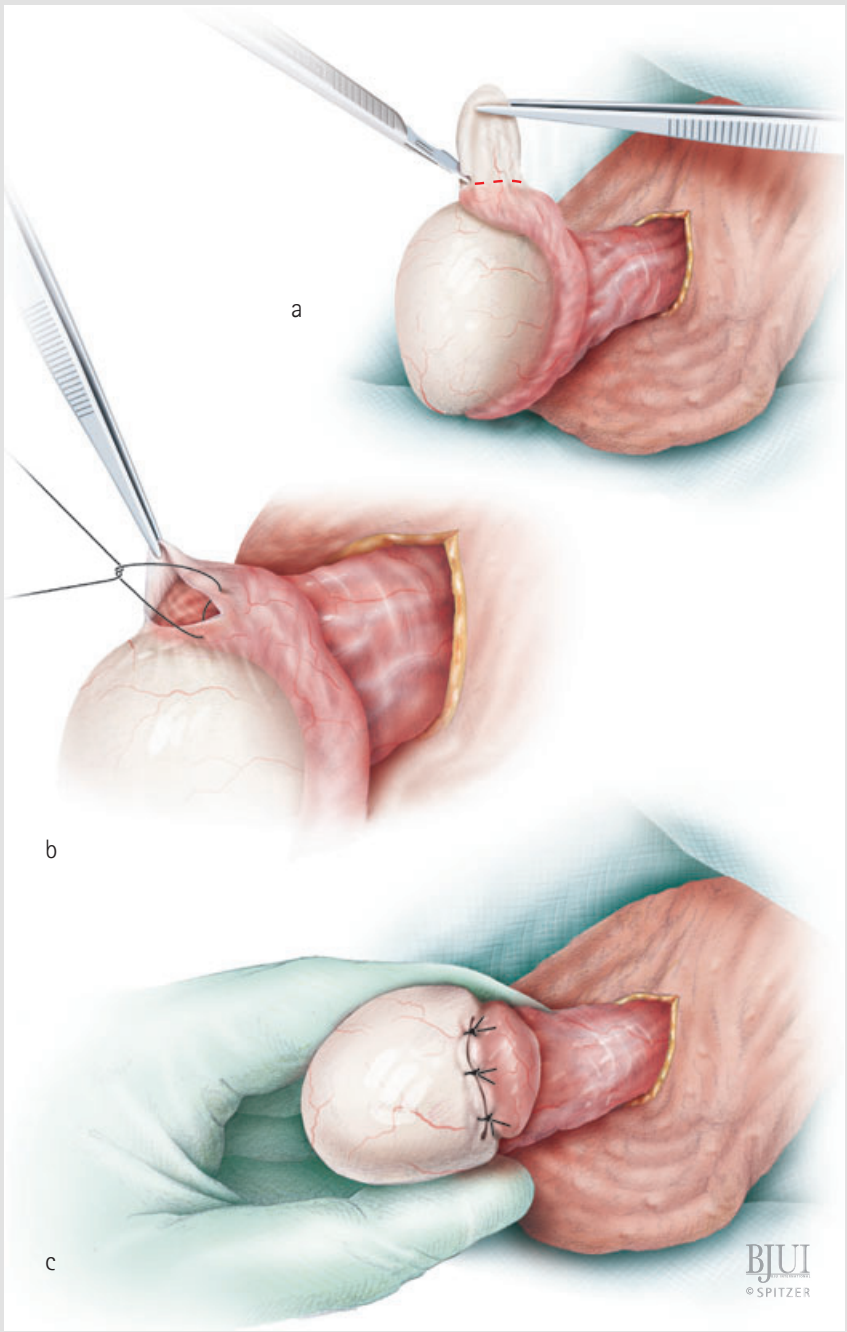
Because the scrotum is difficult to dress, dressings held in place with a standard athletic supporter do well in this situation. An ice pack kept in place for 24h helps to diminish postoperative pain and swelling. Oral analgesics are used for several days. Antibiotics are usually not required.

OTHER TREATMENTS

Puncture of the hydrocele with aspiration and sclerosis is an option for non-surgical candidates. The puncture should be done in the lower pole of the hydrocele. Sclerosis requires up to three treatment sessions and, although high success rates have been reported [7], many still reserve this treatment for poor surgical candidates.

The recurrence and complication rate for this treatment is higher than for the conventional surgical approach. This option is therefore contraindicated for young healthy patients [8].

Figure 10



SPERMATOCELE

Spermatocele comes from the Greek *spermatos* for sperm and *kele* for cyst or mass. It is a cystic structure arising from the epididymis, rete testis or efferent ductuli. These structures are filled with spermatozoa containing fluid that may be milky. These cysts are usually outside the tunica vaginalis and, as with hydrocele, transluminate easily. They are frequently seen on scrotal ultrasound as an incidental finding and may be present in up to 30% of patients [9].

The aetiology of spermatocele is idiopathic, although multiple aetiologies have been proposed such as trauma, infection or inflammatory process. It is hypothesized that the epididymal ducts become obstructed, causing proximal dilatation. The cause of the obstruction is thought to be the seminiferous epithelium continually shedding immature germ cells that are deposited in the efferent ducts, thus causing a blockage [10,11].

Incidental diagnosis initiated through self-examination or on physical examination is the most common way a spermatocele is detected [11]. It is usually located within the scrotum, cephalic and occasionally posterior to the testicle. However, spermatoceles may arise from any location on the epididymis. Usually they are not painful, have distinct borders and are easily separable from the testis.

PRE-SURGICAL CARE, SURGICAL INDICATION, ANAESTHESIA AND SURGICAL EQUIPMENT

Surgical intervention is indicated in painful or large and embracing spermatoceles, and when there is a question of the diagnosis of a potential tumour.

When surgery is indicated because of scrotal pain, the patient should be informed that pain may not be relieved after removing the spermatocele.

Pre-surgical care, anaesthesia and surgical equipment are similar to hydrocele procedures.

SURGICAL TECHNIQUE

Surgery is approached with the same incision as for a hydrocele procedure. Spermatocelectomy should be done without opening the cyst. Sharp dissection is recommended, the cyst structure may be excised from the epididymis without excessive mobilization of the epididymis and testis. If attachments to the epididymis are present they can be dissected and ligated. Haemostasis should be accomplished by cautery. The edges of the epididymis are re-approximated, or a portion of fascia or tunica may be used to close the defect. It may be necessary to perform hydrocelectomy in conjunction with this procedure (**Fig. 10**).

Wound closure is similar to the hydrocele procedures described above.

Sometimes, if the spermatocele has too many adhesions, and dissection is complex, a partial or total epididymectomy is a suggested treatment option [1,3].

COMPLICATIONS AND RESULTS

The most common complication seen is haematoma, usually within the scrotum. Wound infection, scrotal abscess, and recurrent hydrocele or spermatocele complete the list of complications but are less common. Most patients have a successful outcome with a minimal incidence of recurrence.

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