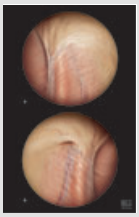
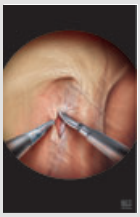
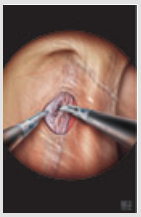
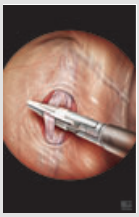
BJUI BJU INTERNATIONAL

Surgery Illustrated – Surgical Atlas
Laparoscopic varicocelectomy

Duong Tu and Kenneth I. Glassberg

Department of Urology, Columbia University, College of Physicians and Surgeons and New York-Presbyterian Hospital, Columbia University Medical Center, New York, NY, USA

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


INTRODUCTION

Varicoceles have been associated with progressive deterioration of testicular function and testicular hypotrophy [1,2]. Varicocele repair can halt or even reverse this progression [3]. Over recent decades, varicocelectomy has developed with numerous approaches: microsurgical subinguinal (Goldstein), inguinal (Ivanissevich), and abdominal (Palomo, nonartery-sparing). Laparoscopic varicocelectomy was introduced in Spain by Sanchez de Badajoz *et al.* [4] in 1990. Over the ensuing years, the technique has been refined in the hands of experienced laparoscopists and variations of the technique have been studied.

Advantages of laparoscopic varicocelectomy include: increased magnification, facilitating more accurate identification of vessels, such as spermatic collateral veins, (i.e. veins running alongside the spermatic cord and together entering the internal ring, a possible cause of recurrence if left alone), lymphatics (the ligation of which can lead to hydrocele formation) and the internal spermatic artery [5,6]. Moreover, laparoscopic varicocelectomy is safe even after prior inguinal surgery. The characteristic supra-inguinal access allows for high ligation of fewer veins vs a more labour-intensive subinguinal approach. In cases of bilateral varicoceles, an additional incision, with its attendant effects, is avoided.

PATIENT SELECTION

The indications for operative repair can be for persistent or recurrent scrotal pain (infrequent in adolescence), testicular size

BJU INTERNATIONAL © 2010 BJU INTERNATIONAL | 106, 1094–1104 | doi:10.1111/j.1464-410X.2010.09709.x

asymmetry, or as part of the treatment for subfertility.

SPECIFIC EQUIPMENT

- 5 mm trocar set
- Scalpel blade
- VersaStep™ (United States Surgical, Norwalk, CT, USA) Veress needle/sheath (or insufflative/access trocar of choice)
- 30 ° lens/camera
- Video tower with display monitors/ electronic insufflator
- Maryland dissectors (Mediflex®; Mediflex Surgical Products, Islandia, NY, USA)
- Laparoscopic endoshears
- LigaSure™ (Covidien, Boulder, CO, USA) vascular sealing system
- Laparoscopic Doppler

PATIENT POSITIONING

- Supine and slight Trendelenburg for laparoscopic entry
- 20–30 ° ipsilateral anterior rotation ('airplane') of the table
- Bladder emptying before abdominal entry (have the patient void just before induction to avoid the need for urethral catheterization)

SURGICAL STEPS

Figure 1

Landmarks (black): pubic symphysis, anterior superior iliac spines.

Surgical preparation field: well above umbilicus, lateral to iliac spines, penis AND scrotum.

Trocar placement left side (shown in red):

- 5 mm supra-umbilical trocar for camera and insufflation
- 5 mm trocar half-way to two-thirds between the umbilicus and pubic symphysis in the midline
- 5 mm trocar on ipsilateral side of the varicocele, lateral to the epigastric vessels around the line of the umbilicus

Trocar placement bilateral:

- Supra-umbilical and midline trocars unchanged
- Lateral trocar on ipsilateral side of first approached varicocele
- For contralateral side, remain with only three port sites but with the option of moving the camera to the lateral port and using the two midline ports as the working ports

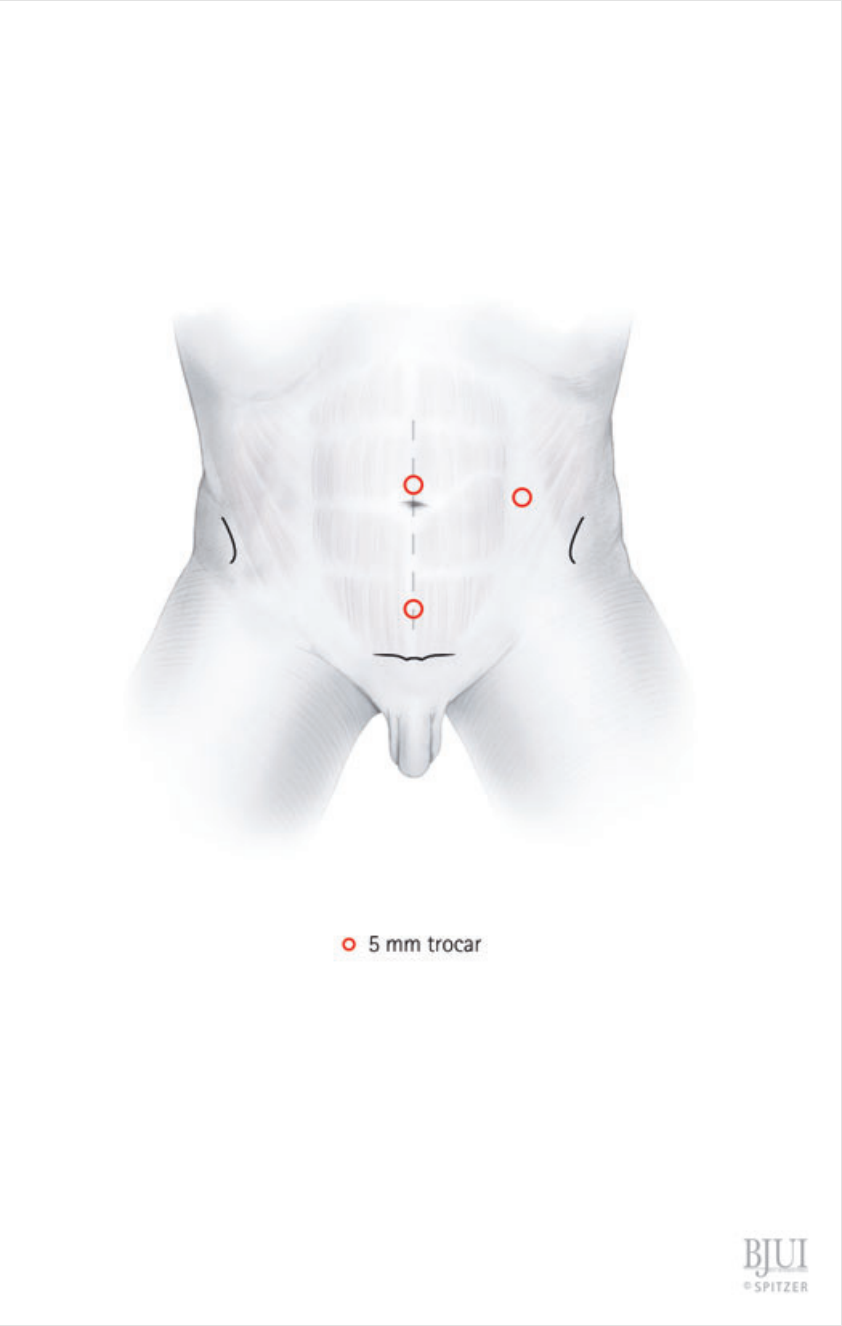


Figure 2

(a) closed ring (right); (b) open ring (left).

Identification of internal ring.

Pull on intrascrotal spermatic cord to delineate internal spermatic cord and associated nearby veins and identify vas deferens.

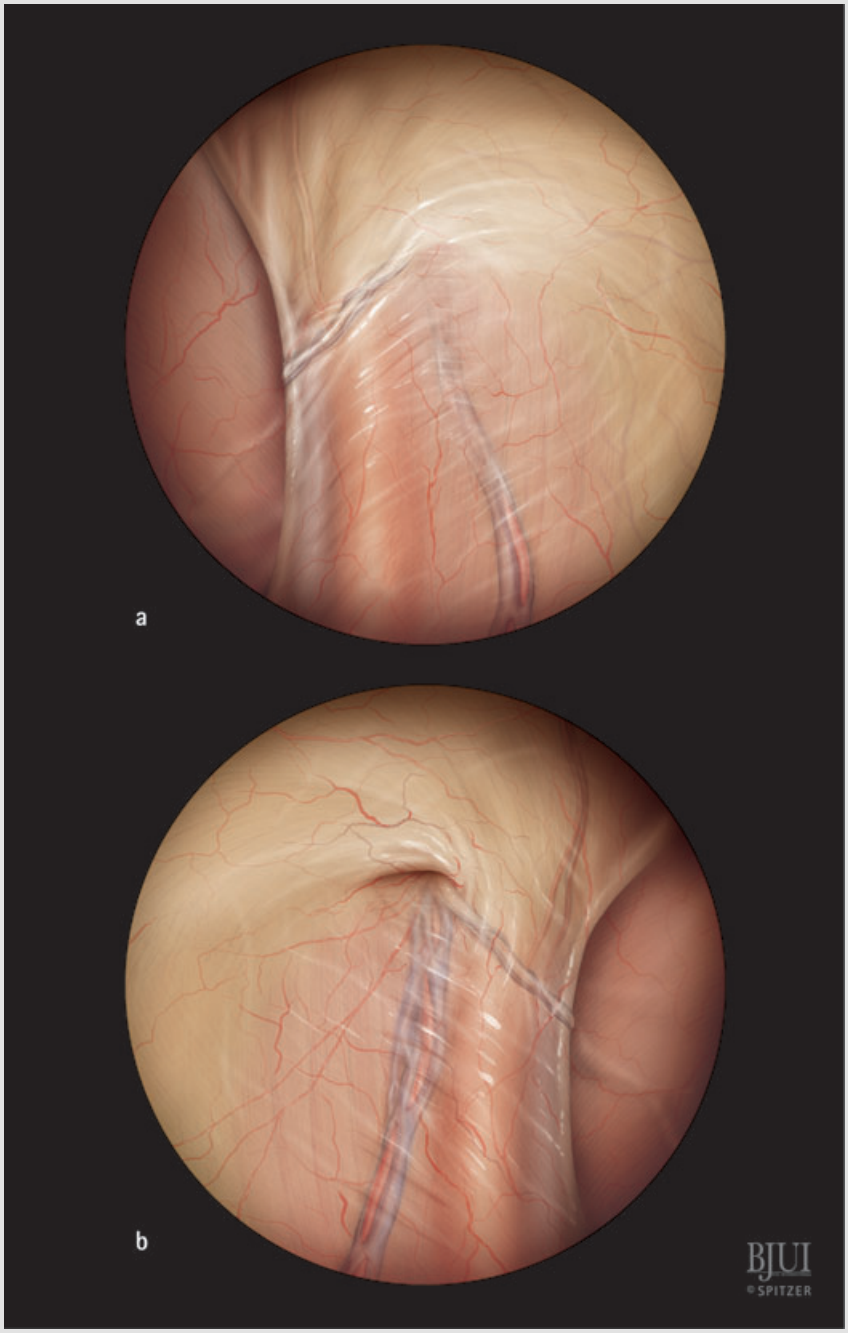


Figure 3

Incision of peritoneum:

- Grasp the peritoneum ≈5 cm proximal to the internal ring (i.e. well proximal to where the vas deferens and its vessels join the cord).
- Using endoshears, the posterior peritoneum is incised at this location just lateral and anterior to the spermatic cord.
- Extend the peritoneal window medially and inferiorly.

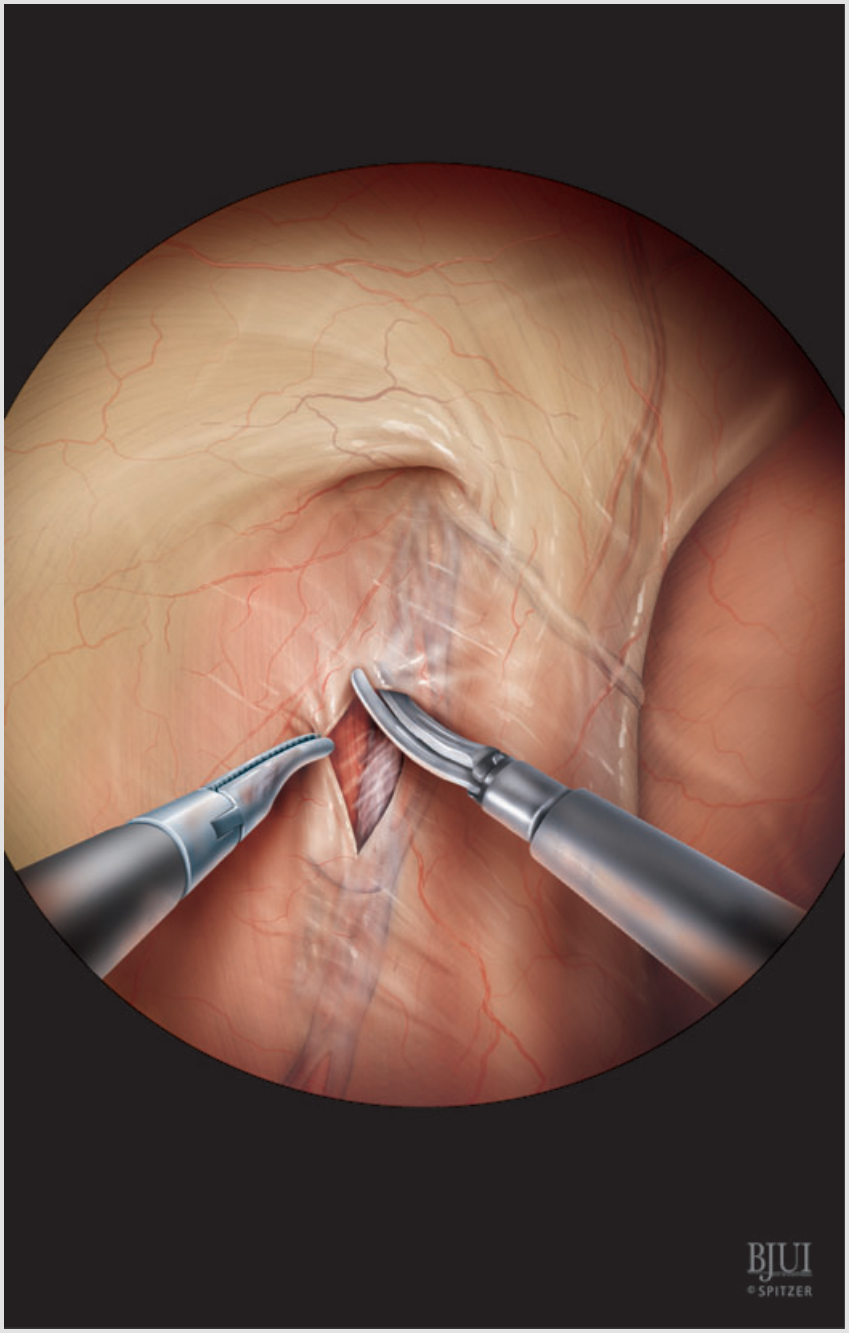


Figure 4

Dissection of veins.

A large anterolaterally situated vein is usually identified first. Using the Maryland dissector, isolate the vein from its adjacent internal spermatic cord vessels and lymphatics.

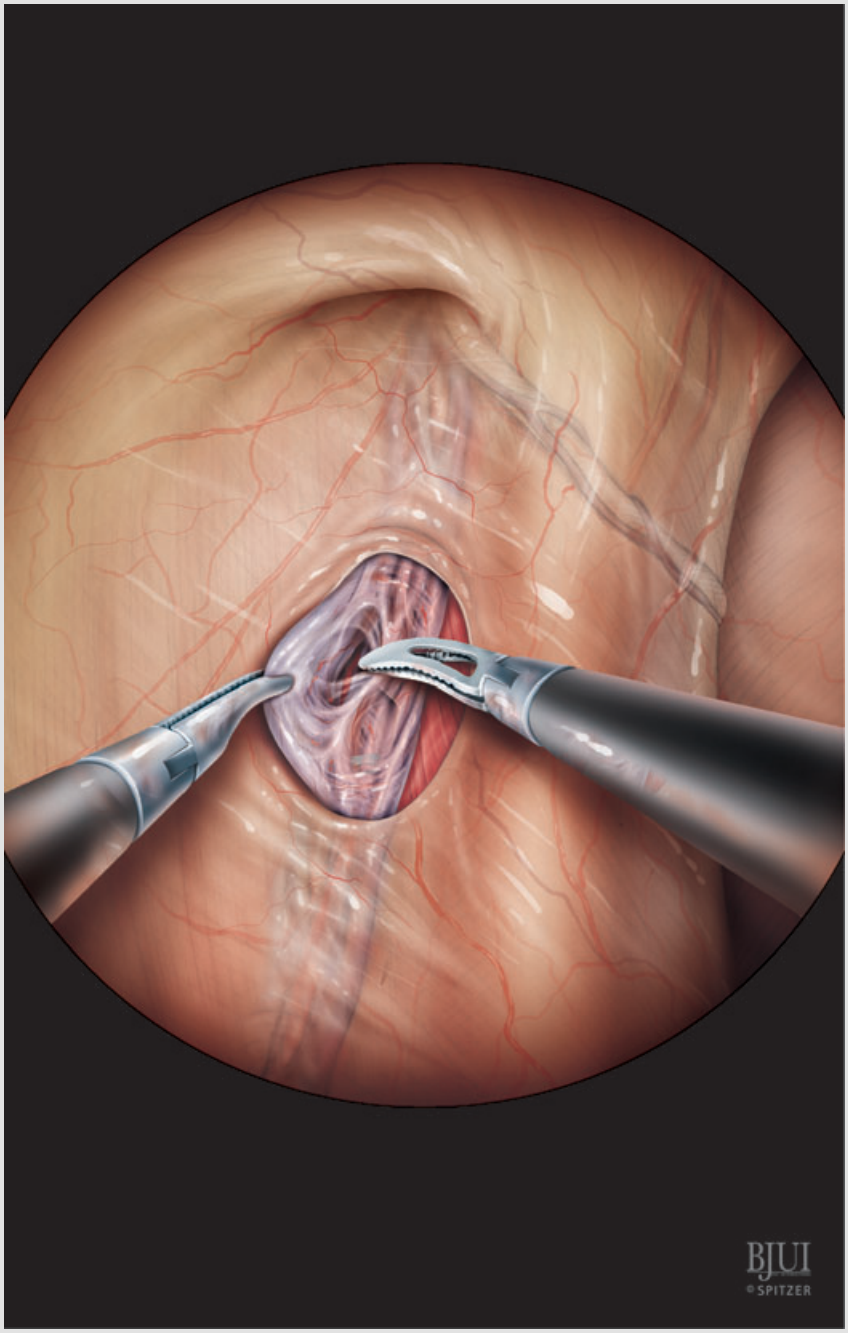


Figure 5

Ligate and divide the vein using the LigaSure device. (We prefer the LigaSure to the multiple vascular staples that would be needed in our approach in which veins are ligated individually.)

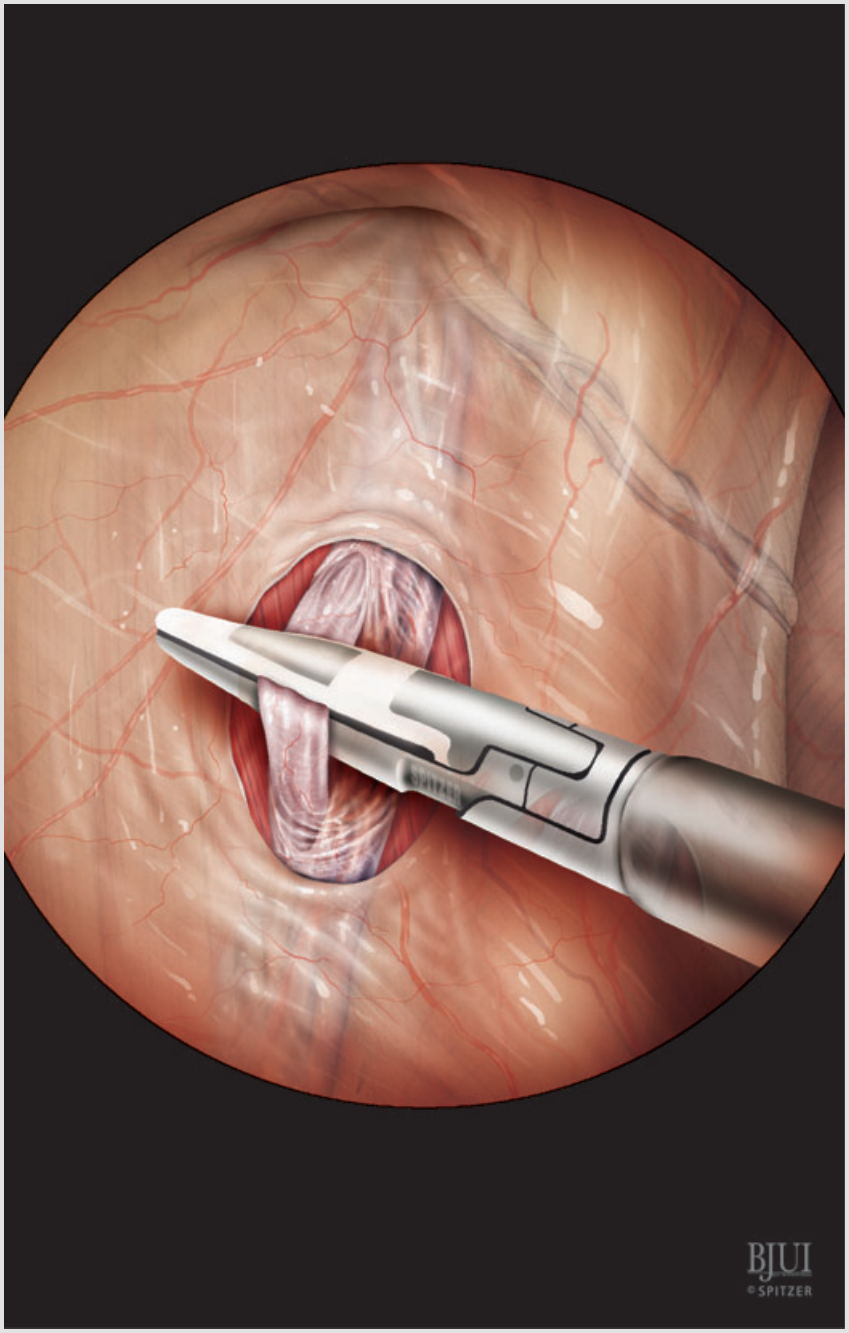


Figure 6

Dissect any remaining veins and, if so desired, identify and preserve the internal spermatic artery.

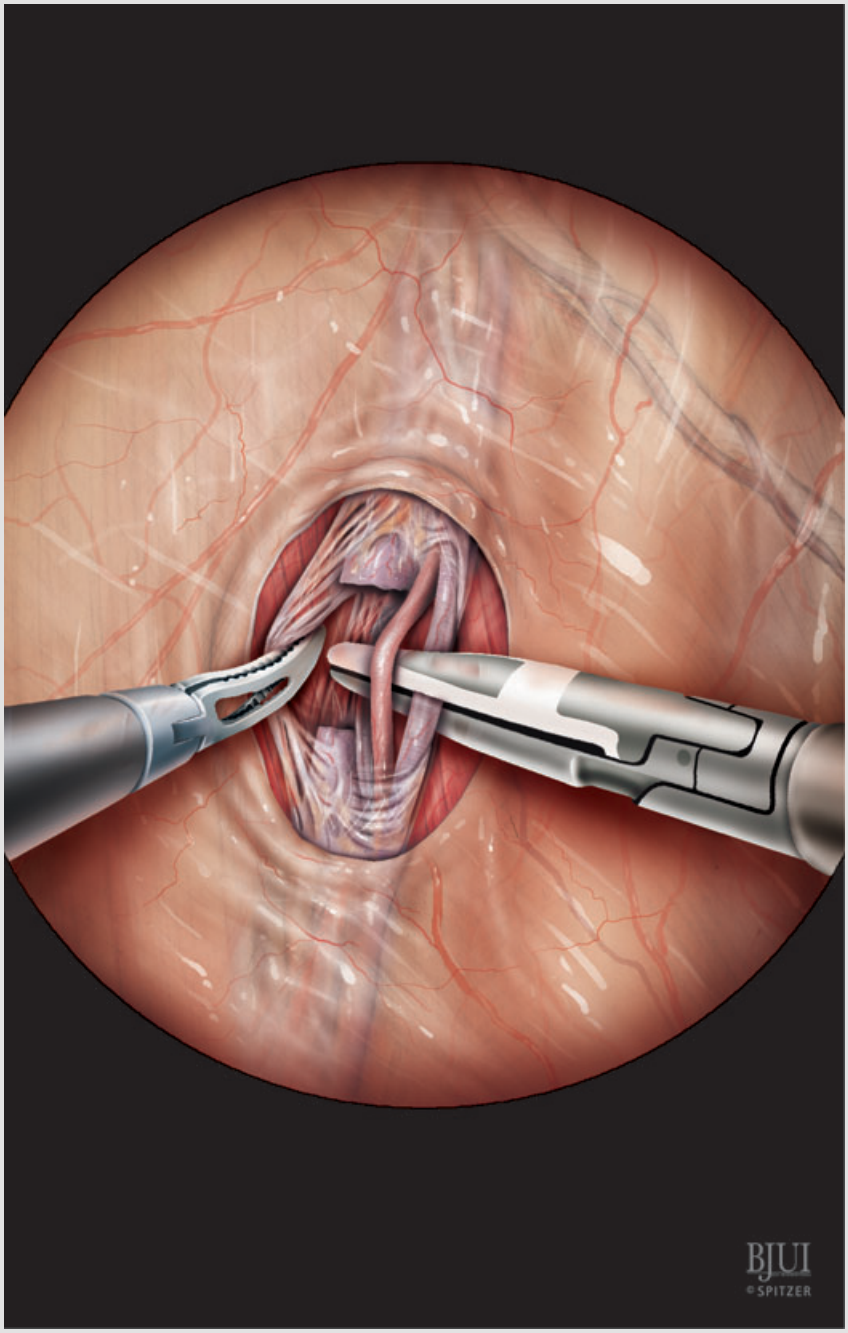


Figure 7

For identification of the internal spermatic artery, use of a laparoscopic Doppler is helpful, especially as often the artery will stop pulsating after manipulation. The Doppler probe can also be used to identify pulsation and to help with the dissection.

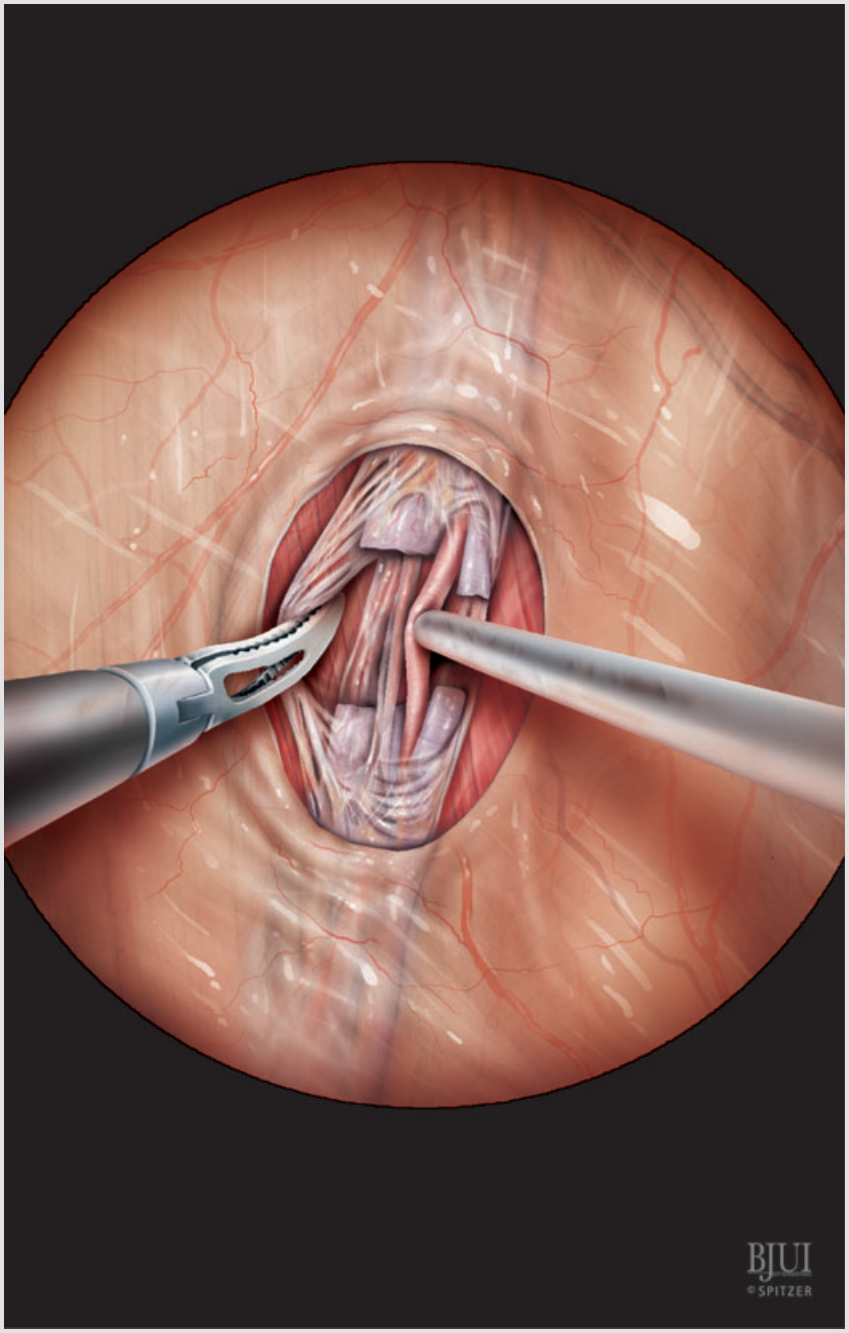
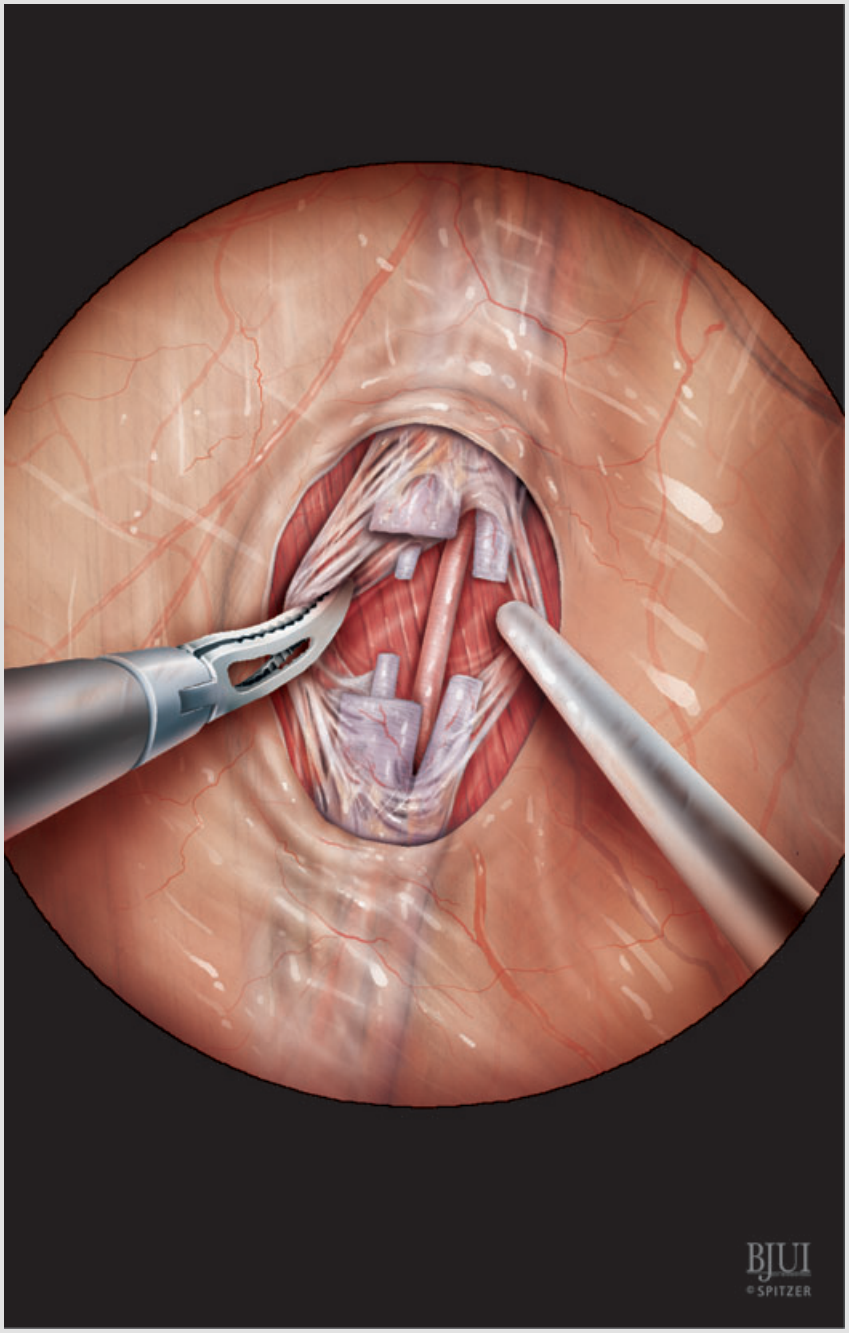


Figure 8

Sparing of lymphatics.

Under laparoscopic magnification, the lymphatic vessels appear as small, translucent vessels. Sometimes they are very abundant and appear in a web-like pattern. Dissect them away from the veins using two endoscopic dissectors.



POSTOPERATIVE CARE

- Use of 5 mm ports (and VersaStep system with stretchable sheath) does not require closure of fascia, although we almost routinely close the supra-umbilical and sometimes the lower midline site as well.
- Close skin incisions with absorbable suture in a subcuticular fashion
- Apply adhesive strips or skin adhesive, e.g. Dermabond® (Ethicon, Somerville, NJ, USA), Indermil® (United States Surgical), etc.
- Incisions stay dry (no bathing) for 24 h
- Same day discharge home

FROM SURGEON TO SURGEON

Sometimes it may appear as though only one large vein can be identified; however, due diligence should be made to find at least two large veins and sometimes two or three smaller veins. In our experience, this has appeared to decrease the rate of failure (recurrence). As mentioned previously, the simple act of pulling on the cord at the scrotum can be helpful in identification of these veins. This is the reason why we include the scrotum in the prepared operative field. However, in our experience, the sparing of large veins running alongside the vas has not led to failure or recurrence.

The importance of preserving the internal spermatic artery is still debated. While Zampieri *et al.* [7] reported artery preservation to be associated with better improvement in semen parameters; they also reported a significant increase in varicocele recurrence. In addition, Feber and Kass [8] reported no difference in catch-up growth between sacrificing and preserving the artery.

Occasionally, open rings such as the one depicted in Fig. 2(b) will be encountered. The feasibility of performing simultaneous laparoscopic herniorrhaphy at the time of the laparoscopic varicocelectomy is currently being explored.

REFERENCES

1 **Chehval MJ, Purcell MH.** Deterioration of semen parameters over time in men with untreated varicocele: evidence of progressive testicular damage. *Fertil Steril* 1992; **57**: 174–7
2 **Lipshultz LI, Corriere JN** Jr. Progressive testicular atrophy in the varicocele patient. *J Urol* 1977; **117**: 175–6
3 **Kass EJ, Belman AB.** Reversal of testicular growth failure by varicocele ligation. *J Urol* 1987; **137**: 475–6
4 **Sanchez-de-Badajoz E, Diaz-Ramirez F, Vara-Thorbeck C.** Endoscopic varicocelectomy. *J Endourol* 1990; **4**: 371–4
5 **Glassberg KI, Poon SA, Gjertson CK, DeCastro GJ, Misseri R.** Laparoscopic lymphatic sparing varicocelectomy in adolescents. *J Urol* 2008; **180**: 326–31
6 **Kocvara R, Dvorácek J, Sedlácek J, Díte Z, Novák K.** Lymphatic sparing laparoscopic varicocelectomy: a microsurgical repair. *J Urol* 2005; **173**: 1751–4
7 **Zampieri N, Zuin V, Corroppolo M, Chironi C, Cervellione RM, Camoglio FS.** Varicocele and adolescents: semen quality after 2 different laparoscopic procedures. *J Androl* 2007; **28**: 727–33
8 **Feber KM, Kass EJ.** Varicocelectomy in adolescent boys: long-term experience with the Palomo procedure. *J Urol* 2008; **180** (Suppl.): 1657–60

Correspondence: Kenneth I. Glassberg, Division of Paediatric Urology, Morgan Stanley Children's Hospital of New York-Presbyterian, College of Physicians and Surgeons 3959 Broadway, New York, NY 10032, USA.
e-mail: kglassberg@aol.com