

A Novel Surgical Approach to Subinguinal Varicocelelectomy: Artery and Lymphatic Isolation Technique

Harry Fisch Christopher W. Johnson Jonathan B. Bingham
Aristotelis G. Anastasiadis

Department of Urology, College of Physicians and Surgeons of Columbia University, New York, N.Y., USA

Key Words

Varicocelelectomy, artery- and lymphatic-sparing · Infertility

Abstract

Clinically relevant varicoceles require surgical management through one of several techniques. We introduce an innovative technique for varicocelelectomy via a subinguinal approach that allows identification and preservation of the arteries and lymphatics. This method allows the safe excision of the varicocele, while minimizing the risk of complications.

Copyright © 2004 S. Karger AG, Basel

Introduction

Varicoceles are a common entity, occurring in approximately 15% of adult males. As far back as 1880, Barfield suggested that varicoceles might contribute to infertility [1]. They are present in as many as 30% of infertile males, and of these patients, 70% see a significant improvement in their seminal parameters after surgical correction [2–9]. Varicoceles can also be associated with pain, especially when large and tortuous.

Surgical techniques for varicocelelectomy include subinguinal, inguinal, or retroperitoneal approaches. Regardless of the approach, some degree of magnification is mandatory. Surgical telescopes, ‘Loupes’, or an operating microscope give the necessary magnification. Emphasis on clearly visualizing and identifying the anatomy is essential in preventing potential complications. If veins are left behind, there will be a persistence of the varicocele. If these veins are not properly ligated, then a hematoma may form. If lymphatics are sacrificed, then the patient may be subject to the formation of a hydrocele [10]. If the arteries are sacrificed, then the patient may suffer from an atrophic testis secondary to arterial insufficiency. All of these complications can be avoided if care is taken to accurately identify the surgical anatomy. Keeping this in mind, we have developed a technique of artery- and lymphatic-sparing subinguinal varicocelelectomy.

Surgical Technique

In this technique, the surgeon and the assistant wear surgical telescope glasses with at least 2.5× magnification. An operating microscope may also be used. Once prepped, a 2.54-cm subinguinal incision is made following Langer’s lines. The external inguinal ring and external oblique fascia are not opened. Once the subcutaneous fat is exposed, a Kelly clamp is passed in an inferomedial direction

KARGER

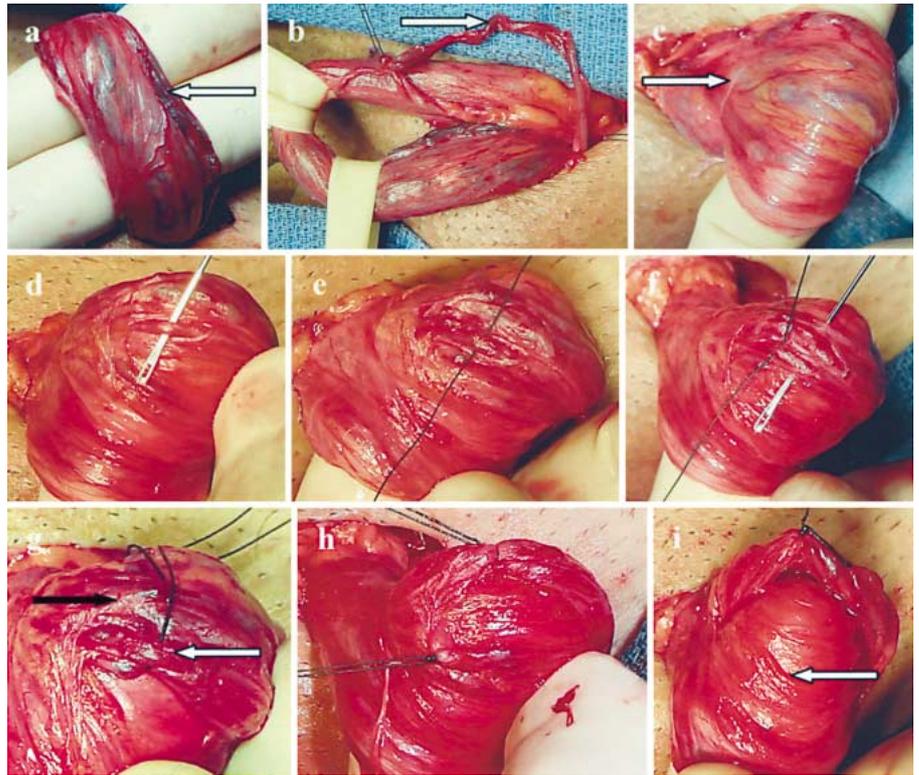
Fax +41 61 306 12 34
E-Mail karger@karger.ch
www.karger.com

© 2004 S. Karger AG, Basel
0042–1138/04/0722–0162\$21.00/0

Accessible online at:
www.karger.com/ujin

Harry Fisch, MD
944 Park Avenue, 1st Floor
New York, NY 10028-0319 (USA)
Tel. +1 212 879 0800, Fax +1 212 988 1634
E-Mail harryfisch@aol.com

Fig. 1. **a** The arrow points to the external spermatic veins. **b** The arrow points to the external spermatic veins which are now ligated and separated from the cord. **c** The cremasteric fascia is opened (the arrow points to the opened fascial edge). **d** The back of a Keith needle is passed under the artery. **e** A 3-0 silk tie is threaded through the eye of the Keith needle and passed under the artery. **f** The Keith needle is passed under the primary vascular bundle. **g** The same 3-0 silk tie is threaded through the eye of the Keith needle and passed under the primary vascular bundle. This enables the primary vascular bundle to be tied off while sparing the spermatic artery. The white arrow points to the spared spermatic artery, and the black arrow points to the remaining veins in the primary vascular bundle. **h** The remaining veins of the cord are isolated and tied off. **i** The arrow points to the spared lymphatics.



through the fat and then spread. This creates a window, exposing the spermatic cord. The surgeon's index finger is then passed through the same channel, thus dilating it to the extent of the incision.

A Babcock clamp is used to gently grasp the cord, enabling the surgeon to pass his finger beneath the cord. The cord is then tented anteriorly over one or two fingers (fig. 1a). One can then make out the cremasteric fascia, covering of the cord, as well as the external spermatic veins, which run lateral to the cord, outside this fascial plane. These external veins are the first ones isolated and ligated (fig. 1b). In our technique, these veins are ligated, using 3-0 silk ties, and then a segment is resected as close to the testis as possible.

The testis is then brought out into the surgical field to inspect for other external veins. There may be prominent external spermatic veins further distal on the testicle. These may be ligated again to ensure complete thrombosis.

Now that the external veins have been ligated and resected, the cremasteric fascia covering to the spermatic cord can be opened. The structures of the cord are now surrounded by a thin sheath (fig. 1c), which can now be bluntly entered exposing the vessels clearly. The vas deferens is then held at the medial aspect of the cord in order to keep it from harm, while the cord is gently tented and spread over the surgeon's finger. Within the cord, there is often a primary vascular bundle in which the artery and multiple veins of various caliber can be found, and a secondary venous bundle which is usually comprised of smaller veins and no artery. The primary vascular bundle is isolated and bluntly dissected from surrounding tissue by rolling the bundle away from the posterior sheath using moist gauze. After the primary vascular bundle has been identified, the artery within it is located. The artery is often palpably firmer than the veins and can be

seen pulsating when held on gentle tension on the surgeon's finger. It is also the first vessel to fill with blood when the tented cord is relaxed slightly. The artery often lies between two or more small veins. It is important to dissect the cord structures with a minimum of manipulation in order to avoid arterial spasm and bleeding as well as distortion of the anatomy.

The back end of a Keith needle is used to dissect and isolate the artery from its accompanying veins. A 3-0 silk tie is then threaded through the eye of the Keith needle (fig. 1d, e) and drawn back under the artery. The silk tie is then left alone as the primary vascular bundle is rolled away from the posterior sheath. The Keith needle is then used again to separate the primary vascular bundle from the posterior sheath (fig. 1f). The same 3-0 silk tie is again threaded into the eye of the needle and drawn back when the needle is removed (fig. 1g). Using this technique, the silk tie encompasses the entire primary vascular bundle minus the artery, which has been spared. Likewise, the posterior sheath, in which the lymphatics lie, is spared. The silk suture is then tied securely, thus ligating the veins of the primary vascular bundle.

The remaining veins of the spermatic cord may then be ligated or resected without risk of injuring the testicular arterial supply (fig. 1h). In ligating these other veins, caution should be maintained so as not to tie off the lymphatics which are located in the posterior sheath (fig. 1i). Figure 1i shows the primary vascular bundle with the artery spared and the secondary venous bundle with the associated lymphatics between the two bundles resting on the posterior sheath. After the remaining veins have been ligated, the cord can be placed back inside its canal. The incision is then closed in two layers.

Conclusions

The success of this approach to varicocelectomy is predicated on several key points. (1) The tissue of the spermatic cord should be kept under tension with the surgeon's finger gently tenting the tissue anteriorly. This helps with the blunt dissection and keeps the tissue in place, which aids in identifying the anatomy. (2) We ligate the external as well as internal spermatic veins. (3) Isolation of the primary vascular bundle from the posterior

sheath is critical in sparing the lymphatics. This is done entirely by blunt dissection. (4) Isolation of the artery within the primary vascular bundle must be done with precision and without harming the artery. This can be done with minimal manipulation using the blunt end of a Keith needle. (5) Surgical loops or an operating microscope give excellent magnification to ensure that the cord structures are correctly identified. Following these guidelines will allow successful artery- and lymphatic-sparing varicocelectomy.

References

- 1 Zorgnotti A: The spermatozoa count: A short history. *Urol* 1975;5:672.
- 2 Dubin L, Amelar RD: Etiologic factors in 1,294 consecutive cases of male infertility. *Fertil Steril* 1971;22:469-474.
- 3 Cockett ATK, Urry RL, Dougherty KA: The varicocele and semen characteristics. *J Urol* 1979;121:435-436.
- 4 Aafjes, JH, vanderVijver JCM: Fertility of men with and without a varicocele. *Fertil Steril* 1985;43:901-904.
- 5 Marks JL, McMahon R, Lipshultz LI: Predictive parameters of successful varicocele repair. *J Urol* 1986;136:609-612.
- 6 Tulloch WS: Varicocele in subfertility: Results of treatment. *Br Med J* 1955;ii:356.
- 7 Brown JS: Varicocelectomy in the subfertile male: A 10-year experience in 295 cases. *Fertil Steril* 1976;27:1046-1053.
- 8 Glezerman M, Rakowszczyk M, Lunenfeld B, et al: Varicocele in oligospermic patients: Pathophysiology and results after ligation and division of the internal spermatic vein. *J Urol* 1976;115:562-565.
- 9 Dubin L, Amelar RD: 986 cases of varicocelectomy: A 12-year study. *Urol* 1977;10:446-449.
- 10 Szebo R, Kessler R: Hydrocele following internal spermatic vein ligation: A retrospective study and review of the literature. *J Urol* 1984;154:924-925.

Editorial Comment

P. Fornara, Halle-Wittenberg

The described technique for ligation of the remaining veins of the primary vascular bundle of the spermatic cord in varicocele patients is very interesting as an artery and lymphatic vessel isolation technique. In comparison with other existing techniques, it is necessary to await a long-term follow-up concerning the fertility of patients

thus treated. With this technique the external as well as the internal spermatic veins are ligated, and isolation of the primary vascular bundle from the posterior sheath is critical in sparing the lymphatics. Particularly the last point could be an advantage compared to other techniques.