

# Introduction

**T**he purpose of this guide is to provide physicians with an easy-to-use reference for learning about the no-scalpel approach for vasectomy. This book provides a detailed description of each step of the approach, plus drawings illustrating the various steps. Physician-trainees may use it during their training for study and for later reference to further develop proficiency in the technique. Trainers who are using EngenderHealth's *No-Scalpel Vasectomy Curriculum* to teach the technique to other physicians will use this guide as a reference text.

The guide has been designed primarily to assist two audiences: (1) experienced vasectomists around the world who want to change from the traditional incisional technique to the no-scalpel approach, and (2) doctors who have never performed vasectomy and who want to begin to provide vasectomy services using the no-scalpel technique.

No-scalpel vasectomy is a refined approach for isolating and delivering the vas that uses vasal block anesthesia; the technique requires unique surgical skills, including new ways to handle special instruments. Recommended methods of occlusion are presented on pages 43 to 49. Because of the innovative features of no-scalpel vasectomy, EngenderHealth recommends that any doctor interested in learning the approach receive hands-on training with a well-qualified and experienced trainer.

## **Hands-On Training Recommended**

From field experience in the United States, EngenderHealth has learned that even experienced vasectomists have difficulty teaching themselves the no-scalpel technique. Manipulating the special instruments requires manual skills and eye-hand coordination that are different from those used in conventional vasectomy. The skills can be learned with hands-on, supervised training, but even then they take time and practice to master.

A case in the United States illustrates the need for hands-on training. A group of experienced vasectomists attended a one-day group orientation on no-scalpel vasectomy that consisted of a lecture, observation of the procedure, and limited practice with a scrotal model. They then received the special no-scalpel instruments and returned to their practices to begin using the technique. Three months later, an EngenderHealth trainer evaluated the physicians' operating performance. The doctors understood and performed key elements of the procedure adequately; they stated that they had mastered about 80% of the technique without hands-on instruction. Yet the procedures observed by the trainer still resulted in too much bleeding; benefits of the no-scalpel technique were therefore diminished. Consequently, the EngenderHealth trainer provided hands-on training to help the surgeons fully master the no-scalpel technique.

No-scalpel vasectomy was developed and first performed in China in 1974 by Dr. Li Shunqiang of the Chongqing Family Planning Scientific Research Institute, located in Sichuan Province. At that time, vasectomy was unpopular with Chinese men, and tubal occlusion was the predominant method of voluntary sterilization. Today in Sichuan, vasectomy outnumbers tubal occlusion by a ratio of four to one; in the rest of China, tubal occlusion outnumbers vasectomy by five to one. More than 10 million Chinese men have already undergone no-scalpel vasectomy.

Under the sponsorship of EngenderHealth, an international team of experts visited Dr. Li Shunqiang in 1985 and observed his refined vasectomy technique. They were convinced that the technique should become the standard approach for vasectomy. One of the team members, Dr. Phaitun Gojaseni, introduced the no-scalpel technique in Thailand upon his return, while another member of the team, Dr. Marc Goldstein, performed the first no-scalpel vasectomy in the United States.

Based upon the findings of the international team, EngenderHealth recommended that training in the no-scalpel approach to the vas should be provided to doctors in other countries and that this would be facilitated if the instruction could take place outside of China. EngenderHealth's initial work in no-scalpel

## History of No-Scalpel Vasectomy

vasectomy focused on experienced vasectomists in large ongoing vasectomy services (Huber, 1989). In 1986, Dr. Li Shunqiang and Dr. Goldstein traveled to Bangkok to work with experienced vasectomists from Bangladesh, Nepal, Sri Lanka, and Thailand. Dr. Apichart Nirapathpongporn of Thailand was trained at this time. Dr. Goldstein and Dr. Apichart then trained other surgeons in their home countries. Clinical training then expanded to other countries. In several countries in Africa, where vasectomy is just being introduced, doctors who have never performed vasectomy are now being trained only in the no-scalpel technique.

**Clinical Findings** No-scalpel vasectomy results in fewer hematomas and infections than does conventional incisional vasectomy (Table 1).

**TABLE 1. Percentage of vasectomies in which infection or hematoma or bleeding occurred, by type of vasectomy and study**

Study	No. of vasectomies	% with infections	% with hematoma or bleeding
<b>Incisional vasectomy</b>			
Philp, Guillebaud, & Budd, 1984	534	1.3	4.5
Kendrick et al., 1987	65,155	3.5	2.0
Nirapathpongporn, Huber, & Krieger, 1990	523	1.3	1.7
Alderman, 1991	1,224	4.0	0.3
Sokal et al., 1999	627	1.3	10.7
<b>No-scalpel vasectomy</b>			
Nirapathpongporn, Huber, & Krieger, 1990	680	0.2	0.3
Li et al., 1991	179,741	0.9	0.1
Li et al., 1991	238	0.0	0.0
Viladoms Fuster & Shihua Li, 1994	400	0.0	0.0
Arellano Lara et al., 1997	1,000	0.0	2.1
Kumar et al., 1999	4,253	0.047	0.07
Sokal et al., 1999	606	0.2	1.7

Source: Adapted from Pollack & Barone, 2000.

Men undergoing no-scalpel vasectomy reported less pain during the procedure and early in the follow-up period than did men having an incisional vasectomy, and also reported earlier resumption of sexual activity after surgery (Skriver, Skovsgaard, & Miskowiak, 1997; Sokal et al., 1999).

Neither conventional nor no-scalpel vasectomy is time-consuming. However, there are reports of decreased operating time when skilled providers use the no-scalpel approach (Li et al., 1991; Nirapathpongporn, Huber, & Krieger, 1990). For example, in the United States, a 40% reduction in operating time has been reported with no-scalpel vasectomy (Li et al., 1991).

# 1 Facilities

Vasectomy can be performed in almost any facility (WHO, 1988). There are a few minimum requirements to providing high-quality services:

- A waiting area with a toilet (The waiting area may also serve as a recovery area.)
- A private space for counseling
- An examination room for the preoperative assessment and follow-up examination
- A clean room for surgery, equipped with a comfortable, clean table for the client and a good light source

In most countries, no-scalpel vasectomy, like conventional vasectomy, is an outpatient procedure performed in an office or clinic.

## Warm Room Temperature Needed to Relax the Scrotum

The temperature of the room is *critical* because it affects the cremasteric and the dartos muscles. The room must be warm, even though a cooler temperature may be more comfortable for the physician.

By relaxing the scrotum, a warm room facilitates the following:

- Manipulation of the vas by using the three-finger technique (see pages 17 and 21 to 22 for a description)
- Fixation of the vas under the median raphe of the scrotum
- Isolation of the vas from the relaxed spermatic cord
- Reduction of operating time
- Reduction of complications

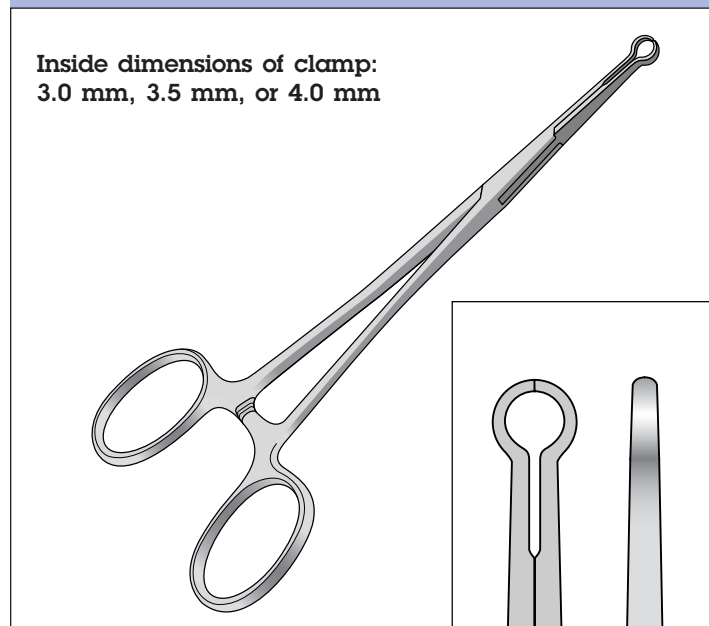
The temperature of the operating room should be at least 70 to 80 degrees F (approximately 20 to 25 degrees C). If additional warmth is needed to relax the scrotum, a heat lamp or warm towels may be used.

## 2 Instruments and Supplies

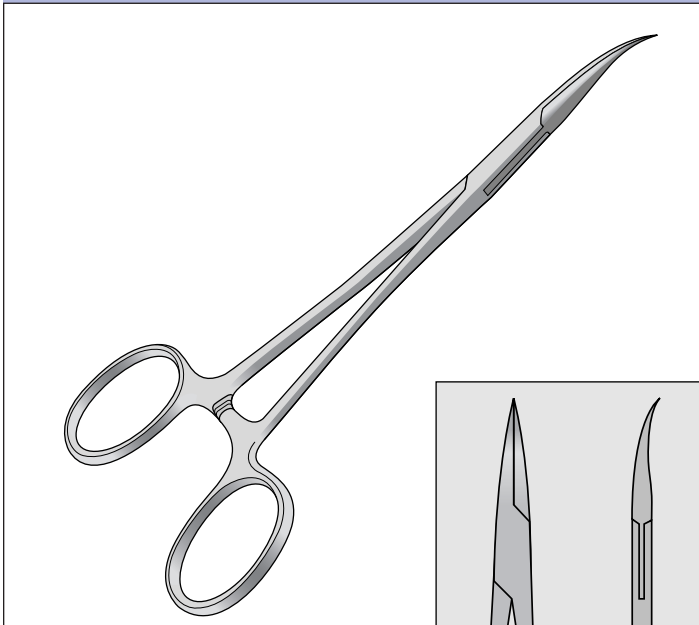
The no-scalpel technique requires two instruments specially designed by Dr. Li Shunqiang.

1. The **extracutaneous ringed forceps** is a type of clamp used to fix the vas deferens (*Fig. 1*). For the sake of clarity, the term **ringed clamp** will be used throughout this manual. Throughout the operation, the surgeon uses the ringed tip of this instrument to encircle and to grasp the vas, without injuring the skin. The clamp grasps the vas both extracutaneously and directly. This instrument comes in three ring sizes: 3.0 mm, 3.5 mm, and 4.0 mm. These different diameters accommodate different thicknesses of vasa and scrotal skin.

FIGURE 1. Ringed clamp



**FIGURE 2. Dissecting forceps**



**2. The dissecting forceps** (*Fig. 2*) is similar to a curved mosquito hemostat, except that the tips are sharply pointed. It is used to puncture the scrotal skin, to spread the tissues, to dissect the sheath, and to deliver the vas deferens. The dissecting forceps can also be used to grasp the vas while a ligature or cautery is applied for occlusion. Because the instrument is a modified hemostat, it can be used to control bleeding. Throughout this manual, the term **dissecting forceps** will be used to refer to this instrument.

Additional instruments and supplies needed for no-scalpel vasectomy are:

- A 10-cc syringe with a 1½-inch, 25- or 27-gauge needle (U.S. system). The syringe and needle are used to infiltrate the local anesthetic, both for the skin wheal and the vasal block anesthesia (see Chapter 4).
- Straight scissors, to cut the vasa deferentia and ligatures.
- Supplies for vasal occlusion (for example, ligature material or a cautery unit).

Table 2 presents a complete list of instruments and supplies needed for no-scalpel vasectomy.

**TABLE 2. Instruments and supplies needed for no-scalpel vasectomy**

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**Instruments**

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- Ringed clamp
  - Dissecting forceps
  - Straight scissors
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**Supplies**

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- Adhesive tape and gauze for positioning the penis away from the surgical field (optional)
  - Scissors for clipping any scrotal hair that would interfere with the procedure
  - Soap and water or antiseptic agents for the surgical scrub (*see page 13*)
  - Alcohol rinse (recommended if plain soap is used for the surgical scrub)
  - Sterile gloves
  - Nonirritating antiseptic solution for cleaning the operative area (*see page 12*)
  - Sterile drapes
  - 10-cc syringe with a 1½-inch, 25- or 27-gauge needle (U.S. system)
  - 1% or 2% lidocaine without epinephrine<sup>a</sup>
  - Supplies for vasal occlusion according to the surgeon's preference (examples: a cautery unit; chromic catgut or nonabsorbable silk or cotton for ligation)
  - Sterile gauze
  - Adhesive tape or Band-Aid for dressing the wound
  - Scrotal support for the man to wear after the procedure (optional)
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<sup>a</sup> Synonyms and proprietary names for generic terms used in this book are given below. Proprietary names are in brackets:

lidocaine = lignocaine = [Xylocaine]  
epinephrine = adrenaline



# 3 Preoperative Preparation

## Counseling and Informed Consent

**B**efore any vasectomy is performed, the client must receive appropriate information and counseling and give his informed consent. Before performing the procedure, check again with the client to be sure he wants no more children and wishes to proceed with the sterilization procedure.

## Preoperative History and Examination

The preoperative history and examination may be done on the day of surgery or a few days before. A medical history should be taken. The preoperative physical includes examination of the local operative area and other examinations and tests as indicated. Laboratory tests are usually not necessary, but if you suspect any clinical abnormality, you will need access to basic laboratory facilities or to a referral center for laboratory examinations. Local skin infections or reproductive tract infections must be treated before vasectomy is performed.

The following are conditions requiring a delay or special precautions:\*

- Local infection—including scrotal skin infection, active sexually transmitted infection (STI), balanitis, epididymitis, or orchitis
- Previous scrotal injury
- Systemic infection or gastroenteritis
- Large varicocele
- Large hydrocele
- Filariasis; elephantiasis
- Local pathological condition (e.g., intrascrotal mass, cryptorchidism, or inguinal hernia)
- Bleeding disorders
- Diabetes
- AIDS (HIV-positive status without AIDS is not a concern.)

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\*See Appendix for the WHO eligibility criteria for vasectomy procedures.

Many of these conditions can be treated, after which vasectomy can be performed. In cases where there is increased risk, you and the client must weigh the risks of the procedure against its benefits.

Before surgery, the client washes his genital area thoroughly with soap and water. During surgery, he wears clean clothing or a surgical gown. The man lies comfortably in a supine position on the table, possibly with a small pillow under his head.

### Preparing the Client for Surgery

To make the operation easier to perform, position the penis away from the operative field. The surgical drape is usually adequate for securing the penis and keeping it away from the operative field. Some physicians secure the penis on the abdomen with tape and gauze, but this method may have the disadvantage of pulling the hair when the tape is removed. If the penis is anchored with tape, put the penis in a 12 o'clock position on the man's abdomen.

### Securing the Penis

Shaving the surgical site is not recommended, as it produces small nicks and breaks in the skin where bacteria can grow and multiply, and thus increases the risk of postprocedure infection. If you believe that the scrotal hair is obstructing the small operative area, clip it while the client lies on the table. If, however, the site *must* be shaved: (1) use antimicrobial soap and water, or shave dry; and (2) shave immediately before the procedure, while the client is on the table.

Before cleaning the area, examine the scrotal area. Palpate the scrotum and vasa to assess the thickness of the scrotal skin and the diameter of the vasa.

### Cleaning the Operative Area

Gently wash the scrotum with a warm antiseptic solution. Be sure to cleanse the area under the scrotum where your fingers will be placed. Also scrub the lower abdomen, the lower part of the penis, and the upper thighs. Warmed Betadine (povidone iodine) or chlorhexidine are the preferred agents. In hot climates, solutions at room temperature are usually adequate.

**HINT: In cool climates, it may be necessary to warm the antiseptic solution.**

## **The Surgical Scrub**

No-scalpel vasectomy is a minor surgical procedure that requires aseptic procedures to prevent infection.

Wash and scrub your hands and forearms either with soap and water or preferably with antiseptic agents (chlorhexidine, iodophors, or hexachlorophene). Use a brush on all surfaces and under the fingernails. An alcohol rinse is recommended when plain soap and water are used for the scrub.

Wear a clean shirt or apron. A sterile gown, cap, and mask are optional.

Wear sterile surgical gloves. Change gloves between each case. If scrubbing is not feasible between each case because of the risk of skin irritation, scrub for three minutes every hour or at least after every four or five cases (whichever comes first) to prevent recolonization of the skin.

## **Draping the Operative Field**

Cover the prepared area with a sterile fenestrated drape, and lift the scrotum through the drape's small window. A set of towels can be used as an alternative to the drape.

The window should be small enough to allow only the scrotum to be isolated. Everything else, from the client's chest to his knees, should be covered.

Also, cover a small instrument table with a sterile drape.

## **Optional: Administering a Preoperative Tranquilizer**

**HINT: Some doctors in the United States have found that oral tranquilizers administered preoperatively relax the muscle fibers of the scrotum, thus allowing the scrotal skin to be as thin as possible during vasectomy. This suggestion is particularly relevant for extremely nervous clients.**

*Note:* Information in this section is adapted from: EngenderHealth, 2000.

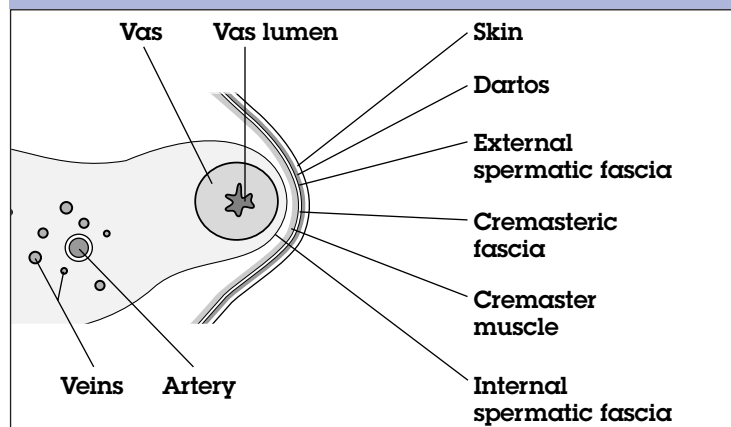


# 4 Anesthesia

**G**ood local anesthetic technique is essential for a pain-free vasectomy. It also prevents local hematoma and injury to the testicular vessels, which may result from multiple blind injections. Dr. Li Shunqiang's anesthesia procedure, which is described below, achieves both of these objectives and also has several other advantages. The technique, which involves a deep injection alongside the vas, creates a vasal nerve block. Conventional techniques anesthetize only the area around the skin-entry site. Injection of the anesthetic away from the vasectomy site in the direction of the inguinal ring helps make skin entry easier. Care is taken when injecting the lidocaine to keep the needle away from the internal spermatic fascia that enclose the testicular artery and veins (*Fig. 3*). Because the surgeon makes only a single needle puncture and one smooth injection for each vas, the risk of bleeding is reduced.

In a randomized trial comparing no-scalpel vasectomy to the conventional technique, men undergoing no-scalpel vasectomy with vasal block anesthesia reported experiencing less operative pain than did men undergoing conventional vasectomy (Sokal et al., 1999).

**FIGURE 3. Cross-section of the spermatic cord**



**NOTE:** The following instructions and accompanying illustrations are for the right-handed operator. Some left-handed operators report that they have found it helpful to use a mirror when viewing illustrations designed for right-handed operators.

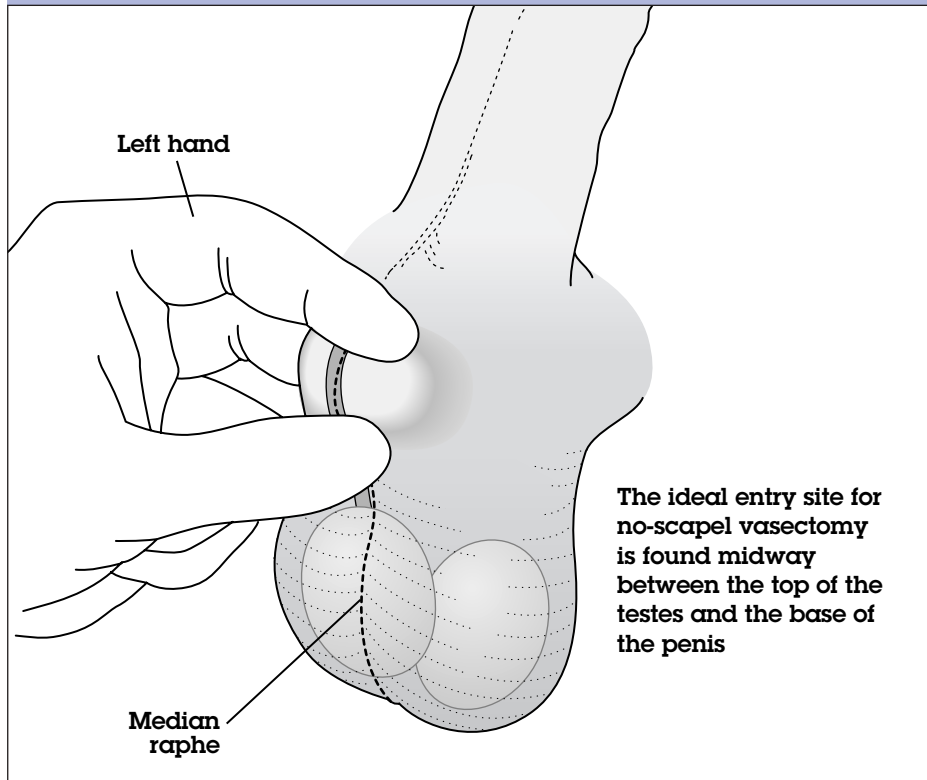
Prepare a syringe to administer 100 mg (10 cc 1% or 5 cc 2%) lidocaine without epinephrine. This amount should be sufficient for skin wheal and vasal block anesthesia in most clients. Attach a 1½-inch (or metric equivalent) small-gauge needle to the syringe. A 25- or 27-gauge needle is recommended, but a 22- or 23-gauge needle can also be used.

Epinephrine is not recommended because it contracts the blood vessels and results in less apparent bleeding at the time of surgery. It is best to be able to detect and control all bleeding *during* surgery to prevent hematomas from forming after the client leaves the surgical facility. If the lidocaine does not contain epinephrine, small bleeding sites are more likely to be detected and controlled during surgery.

The maximum individual dose of lidocaine without epinephrine should not exceed 4.5 mg/kg (2 mg/lb) of body weight. In general, it is recommended that the maximum total dose not exceed 300 mg (Medical Economics, 2002). This equates to 30 cc 1% or 15 cc 2% lidocaine without epinephrine.

## Preparing for Anesthesia; Selecting the Anesthetic and Supplies

**FIGURE 4. The three-finger technique: Isolating the right vas**



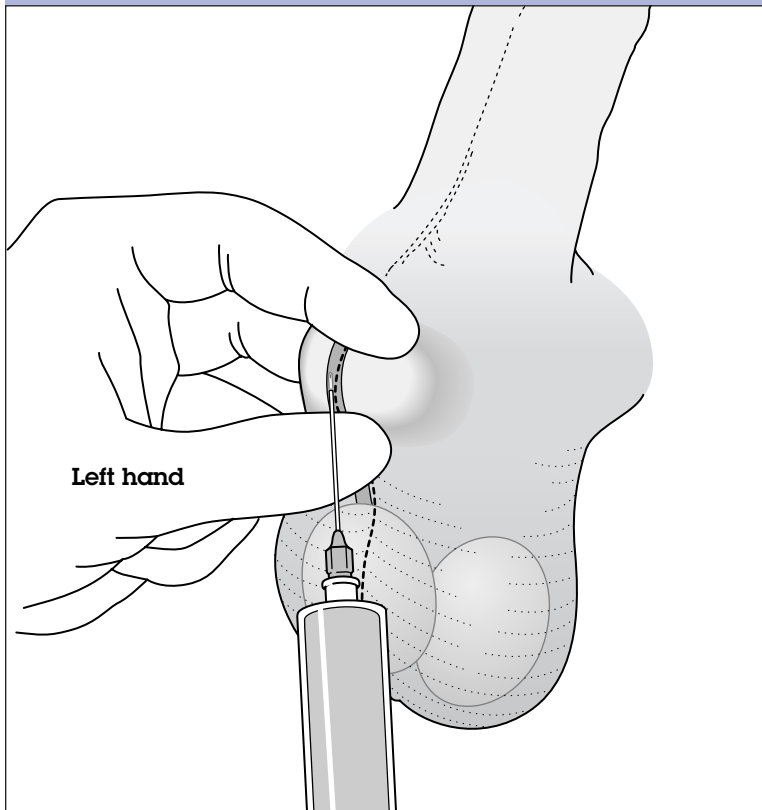
**The Three-Finger  
Technique:  
Isolating  
the Right Vas**

If you are right-handed, stand on the client's right side. (If you are left-handed, stand on the client's left side.) Place your left thumb approximately midway between the top of the testes and the base of the penis on the median raphe. With the middle finger of your left hand under the scrotum, palpate the vas and sweep it toward the raphe beneath your thumb. Hold the vas in position between the thumb and middle finger while placing your left index finger on top of the scrotum, slightly above the thumb (*Fig. 4*). Note that your fingers should be perpendicular to the vas. You will have created a "window" between your thumb and index finger through which you will make the puncture. Upward pressure from the middle finger, combined with downward pressure exerted by the index finger, creates a bend in the vas for easier entry. Maintain the three-finger hold as you anesthetize the right side.

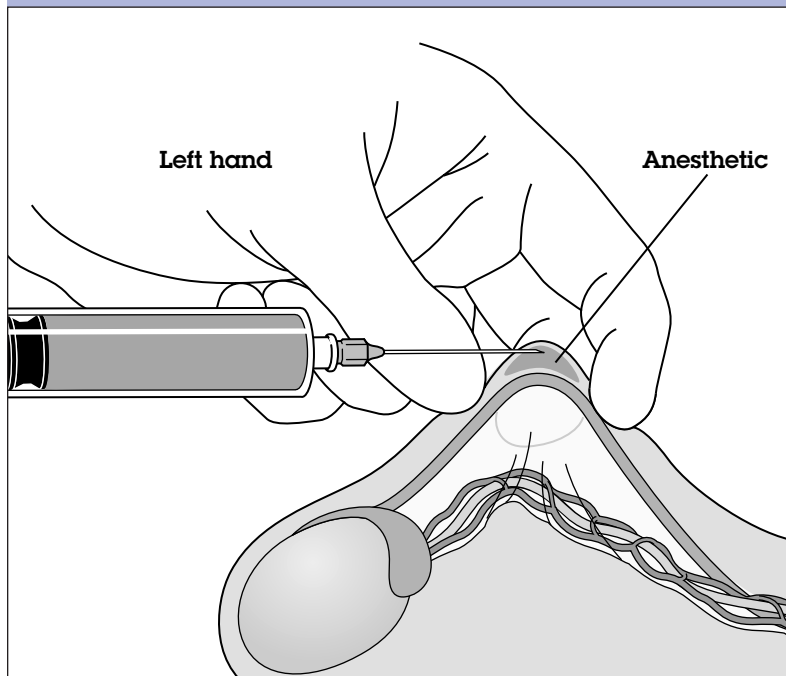
## Raising the Skin Wheel

The needle entry site is at the midline, over the vas deferens midway between the thumb and the index finger. Use only the tip of the needle to raise a superficial skin wheal, 1 to 1½ cm in diameter (*Fig. 5*). To raise the skin wheal, hold the syringe at approximately a 5- to 15-degree angle (*Fig. 6*), with the needle bevel facing up. Inject lidocaine into the dermis and subcutaneous tissues; 0.5 cc is usually adequate.

**FIGURE 5. Raising the skin wheal**



**FIGURE 6. Side view of the skin wheal**



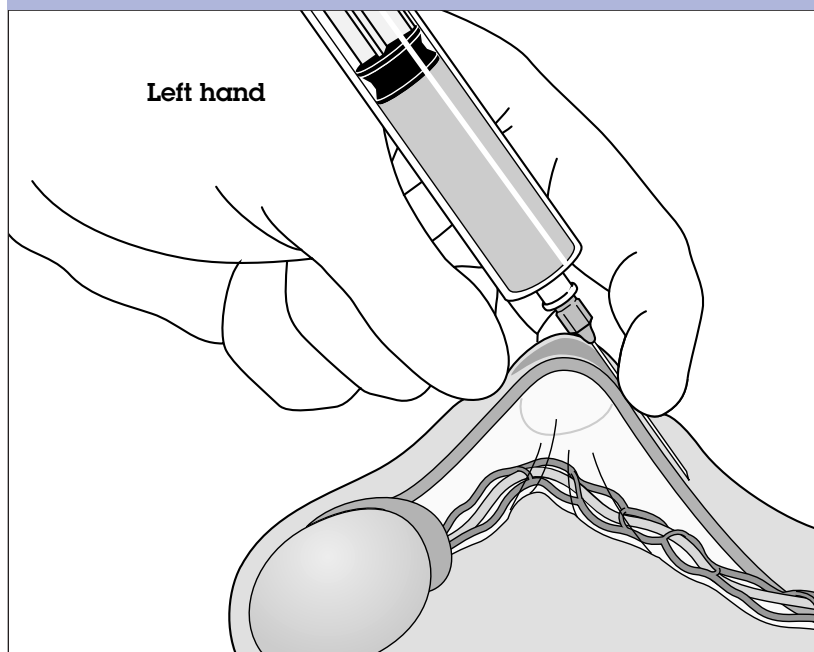
**PITFALLS:** Avoid two pitfalls when raising the skin wheal. First, do not inject the lidocaine too deeply. At this point in the procedure, you are anesthetizing only the scrotal skin. In the next step, you will create a vasal block that will anesthetize deeper tissues. Second, to avoid swelling around the vas at the puncture site, do not inject more than 1 cc of lidocaine. A persistent wheal will prevent the ringed clamp from closing properly around the vas.

Creating a vasal block is a critical difference from the way anesthesia has been traditionally administered for vasectomy. The steps described below create a vasal nerve block away from the operative site.

## Creating the Vasal Block: Right Vas

After making the superficial skin wheal, advance the needle parallel to the vas within the external spermatic fascial sheath toward the inguinal ring (*Fig. 7*). Advance the full length of the needle, 1½ inches, without releasing any of the anesthetic. **Gently aspirate to ascertain that the needle is not in a blood vessel.** Without withdrawing the syringe, slowly inject 2 to 5 cc (depending on concentration) of lidocaine within the external spermatic fascial sheath around the right vas deferens.

**FIGURE 7.** Advancing the needle parallel to the vas within the external spermatic fascial sheath toward the inguinal ring



**HINT: When the needle is in proper position and the injection is performed inside the external spermatic fascia, there is no resistance to the injection.**

Remove the needle from the right sheath; do not inject lidocaine while withdrawing the needle.

**The Three-Finger  
Technique:  
Isolating  
the Left Vas**

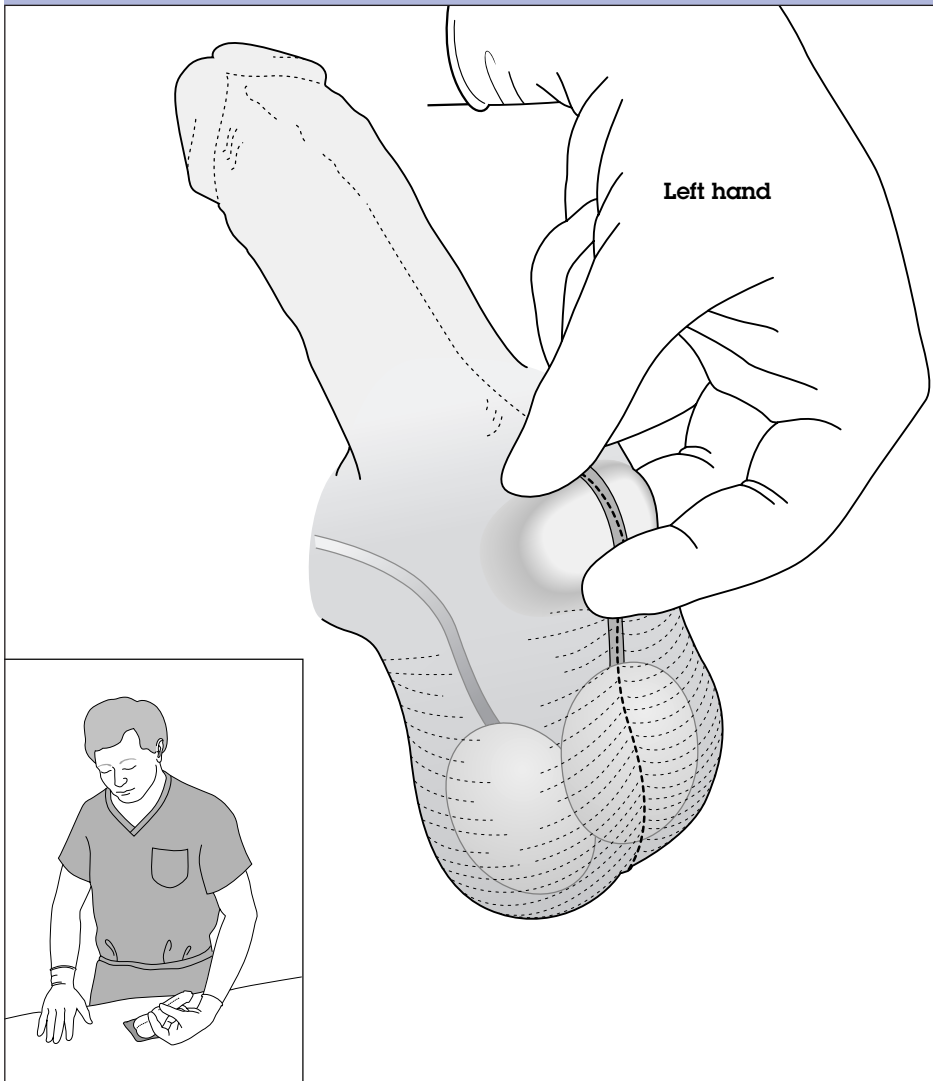
Anesthetize both sides before entering the scrotum and occluding the right vas.

**HINT: To hold the client's left vas in the three-finger grip while standing on his right side, you will be more comfortable if you take a step toward the client's head and turn a bit to face his feet. To approach the vas from this lateral position, reach across the client's abdomen with your left hand.**

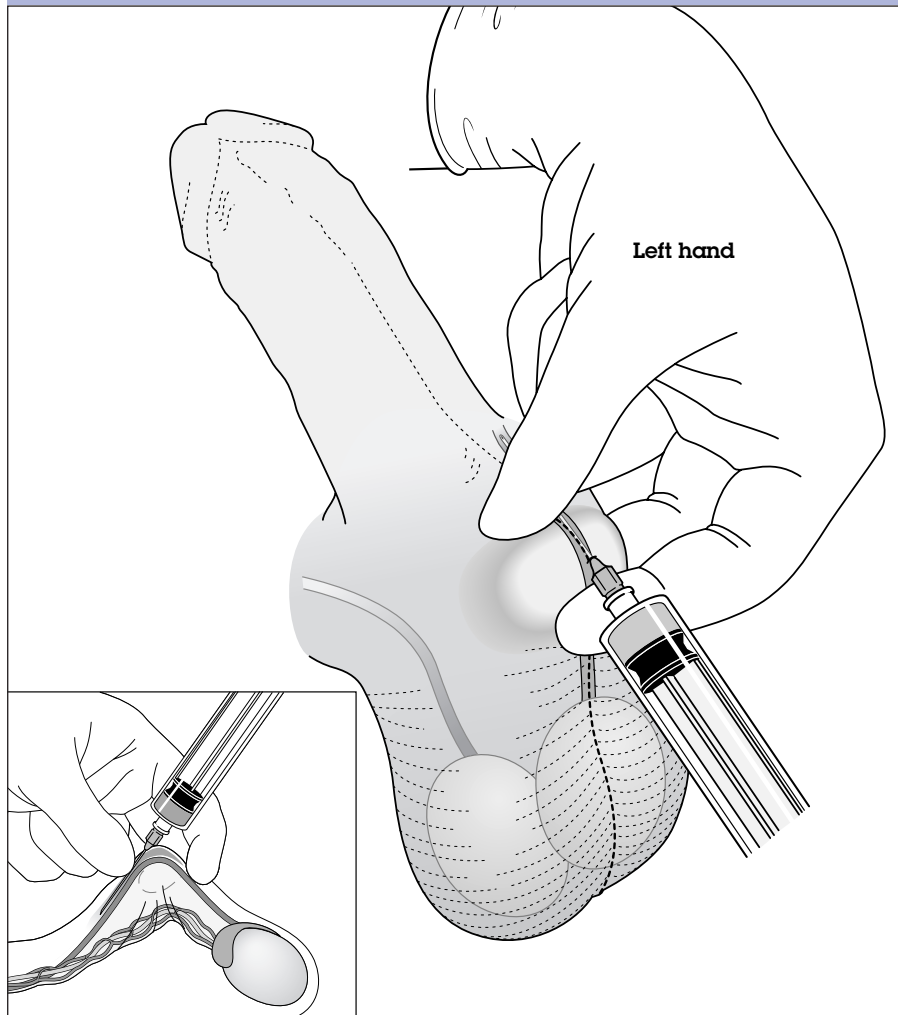
The next step will be to position the left vas under the anesthetized puncture site. To do this, begin by placing your thumb in the upper third of the scrotum while the index finger is in the middle third. (This is different from the three-finger hold on the right side.) As with the right side, position the middle finger beneath the scrotum to identify the vas and sweep it to the puncture site. Once again, use the middle finger to elevate the vas, while your thumb and index finger press downward to create a bend in the vas at a point directly under the puncture site. Now, however, the thumb is superior to the index finger (*Fig. 8, page 22*). Note the differences between Figures 5 and 8.

For a right-handed operator, isolating the left vas may be more difficult and awkward than was isolating the right vas. It may take time and practice to master. A left-handed operator will need to reverse these positions and thus may find isolation of the right vas more difficult.

**FIGURE 8. The three-finger technique: Isolating the left vas**



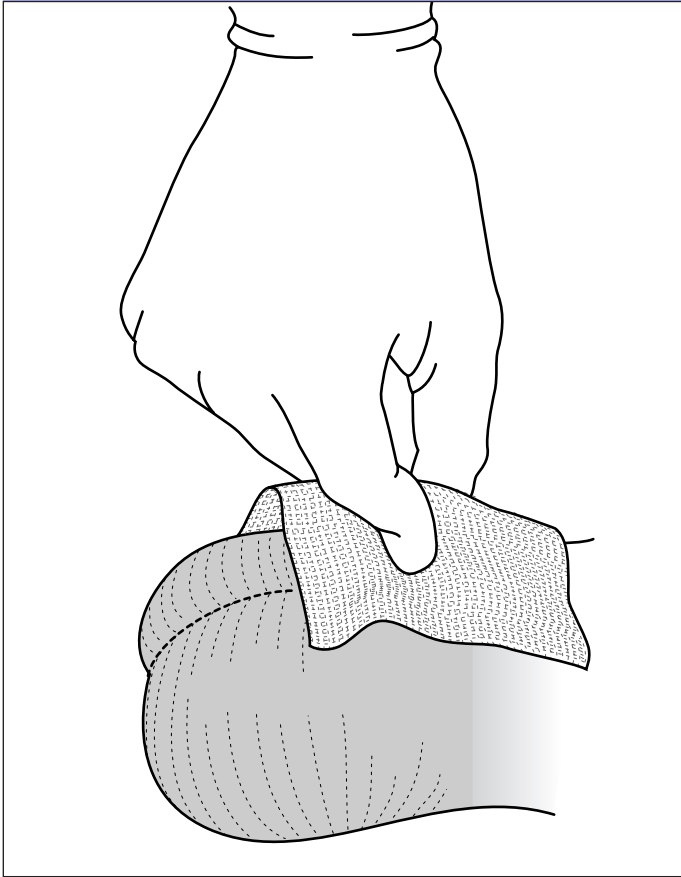
**FIGURE 9. Anesthesia technique:  
Deep infiltration of the left vas**



**Creating  
the Vasal Block:  
Left Vas**

Reintroduce the needle through the same hole previously used; a second skin wheal is not needed. Advance the needle parallel to the left vas into the external spermatic fascia (*Fig. 9*). As with the right vas, inject 2 to 5 cc of lidocaine within the external spermatic fascial sheath around the left vas deferens.

**FIGURE 10. Pinching the skin wheal**



After removing the needle, gently pinch the skin wheal between the thumb and forefinger for a few seconds to reduce its size and to soften and thin the local tissues (*Fig. 10*).

**PITFALL:** Remember, a persistent wheal will prevent the ringed clamp from closing properly around the vas; gentle compression helps to reduce the size of the wheal.

If 2 to 5 cc of lidocaine has been injected into each side and the client still feels pain when the surgical procedure begins, repeat the vasal block on the painful side. Do not raise another skin wheal.

**Pinching  
the Skin Wheal**

**If the Client  
Feels Pain  
After Surgery  
Begins . . .**