WORLD VASECTOMY DAY

NO-SCALPEL VASECTOMY TRAINING MANUAL WORLD VASECTOMY DAY

Comprehensive Guide to Safe, Skilled and Patient-Centered Practice

PROLOGUE – FIRST EDITION OF THE WVD NO-SCALPEL VASECTOMY TRAINING MANUAL

This first edition of the WVD No-Scalpel Vasectomy Training Manual is more than just a guide—it's a landmark moment in the global movement for male reproductive responsibility. Drawing from the collective wisdom, technical expertise, and unwavering dedication of doctors, researchers, and trainers from across the globe, this manual represents years of accumulated experience and a shared commitment to excellence in vasectomy provision.

While we have not fully re-invented the wheel, we proudly offer this manual as a significant step forward—an effort to harmonize a technique trusted by some of the most seasoned providers worldwide. That said, it is important to emphasize that there is no singular way to perform a proper vasectomy. The science of vasectomy will evolve, and so will we. Feedback from practitioners everywhere is not only welcomed—it is essential. However, the method outlined here has been shaped by professionals who have successfully completed hundreds of thousands of procedures, with remarkably low failure and complication rates. It is a technique grounded in real-world experience and driven by a deep respect for evidence-based practice.

This document marks the beginning of a new chapter for the WVD Academy, our global institution committed to curating knowledge, training new providers, and elevating male contraceptive care.

We are deeply grateful to Dr. Michel Labrecque for his leadership, passion, and generosity. As well, a special nod to Dr. Esgar Guarin. This manual is an expansion of an earlier draft he produced last year. It takes a village of doctors and so, a heartfelt thanks to Dr. John Curington, Dr. Eloisa González, Dr. Esgar Guarin, Dr. Chris Tonozzi, Dr. Alex Galante, Dr. Melanie Savard-Coté, and Dr. Mary Samplaski for their invaluable contributions.

Finally, we thank Lic. Silvana Resendy Birhuett, whose precision and tireless dedication made this manual possible.
Welcome to the future of vasectomy training.

Sincerely,

Jonathan Stack,
Co-Founder and Executive Director World Vasectomy Day, Inc.

Dr. Doug Stein,
Co-Founder and WVD Board Member World Vasectomy Day, Inc.

Introduction to the NO-SCALPEL VASECTOMY (NSV) Training Manual – World Vasectomy Day

This manual has been conceived as an essential tool for training in No-Scalpel Vasectomy (NSV) within the framework of the global World Vasectomy Day (WVD) movement. It offers coherent learning objectives, updated technical content, validated pedagogical resources, and a clear methodology to support the learning of the procedure.

The manual is geared towards healthcare professionals, as well as for trainers and coordinators of capacity-building programs. It can be implemented as part of in-person, virtual, or hybrid learning environments, and is adaptable to various institutional contexts and realities. Its content has been reviewed and validated by vasectomy specialists from different regions of the world, integrating clinical and academic experience into a highly accessible and practical format.

A sequential reading is recommended for those who are new to the topic, while more experienced professionals may consult specific chapters as needed. In both cases, the goal is the same: to contribute to the training of competent, ethical professionals who are committed to universal access to high-quality male reproductive health services, with an emphasis on vasectomy.

Beyond its technical function, this document reflects WVD's commitment to quality care, the strengthening of local capacities, and the promotion of gender equity through the inclusion of men in reproductive health. This manual is not an endpoint, but a shared foundation upon which to continue building. Each reader, each trainer, and each country that adopts it will enrich it with their own experiences and with their national and local health policies. The true strength of this manual lies in being a living tool in service of a collective purpose.

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We are deeply grateful for the commitment of all individuals and entities who contribute every day to expanding access to male contraception, promoting gender equity, and strengthening reproductive health globally.

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1. The WVD Training Program

The World Vasectomy Day (WVD) No-Scalpel Vasectomy (NSV) training program aims to equip healthcare providers with the necessary knowledge, skills, and attitudes to deliver high-quality, patient-centered vasectomy services. This program plays a vital role in expanding access to male contraception, which contributes to global family planning goals by promoting gender equity in reproductive health responsibilities.

The NSV training program is divided into three core phases to ensure comprehensive learning:

Classroom Learning

- Focuses on theoretical knowledge, including anatomy, counseling techniques, procedural guidelines, and infection prevention.
- Delivered through lectures, discussions, and interactive activities to build foundational understanding.

Simulated Practice

- Provides hands-on training on scrotal models to refine technical skills in a low-risk environment under the supervision of trainers.

Clinical Practice

- Involves supervised practice on patients to apply theoretical knowledge and simulated skills in real-world scenarios.
- Trainees perform an average of 20 vasectomy procedures under supervision to determine and ensure competency.

Your WVD Training Manual provides all theoretical and practical knowledge needed to deliver this high-quality care to your patients and will complement your training program. Let's start!

2. Introduction to Vasectomy

General Objective

To provide participants with a foundational understanding of vasectomy as a permanent method of contraception, including its history, benefits, techniques, and role in reproductive health and family planning.

Specific Objectives:

By the end of this module, participants will be able to:

1. Define vasectomy and explain its mechanism of action as a method of permanent contraception.
2. Summarize the historical development and global adoption of vasectomy, including the introduction of no-scalpel vasectomy (NSV).
3. Compare the advantages and disadvantages of vasectomy to other contraceptive methods, highlighting its advantages and limitations.
4. Describe the various techniques for vas isolation/delivery and vas occlusion.

2.1. Definition and Overview of Vasectomy

Vasectomy is a surgical procedure that permanently prevents pregnancy by dividing and occluding the vasa deferentia, the tubes responsible for transporting sperm from the testes to the urethra. The procedure does not affect the production of sperm; instead, it prevents sperm from mixing with seminal fluid. It is one of the safest and most effective methods of permanent contraception. The process typically takes about 15 minutes and can be performed in an outpatient setting under local anesthesia.

Key facts about vasectomy:

- It is a permanent contraceptive method intended for men who are certain they do not want more children.
- It does not affect testosterone levels, sexual performance, or libido.
- Vasectomy is more straightforward, less expensive, and safer than female sterilization (tubal ligation).
- Vasectomy does not produce immediate sterility.

2.2. Historical Background of No-Scalpel Vasectomy

The modern vasectomy technique evolved over decades to minimize invasiveness and complications. The no-scalpel vasectomy (NSV) was introduced in 1974 by Dr. Li Shunqiang in China. This technique gained international recognition for its effectiveness and patient comfort.

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 method for vasectomy. One of the team members, Dr. Phaitun Gojaseni, introduced the no-scalpel technique to Thailand upon his return, while another member of the team, Dr. Marc Goldstein, performed the first no-scalpel vasectomy in the United States.

Based on the international team's findings, Engender Health recommended that training in the technique should take place outside of China.

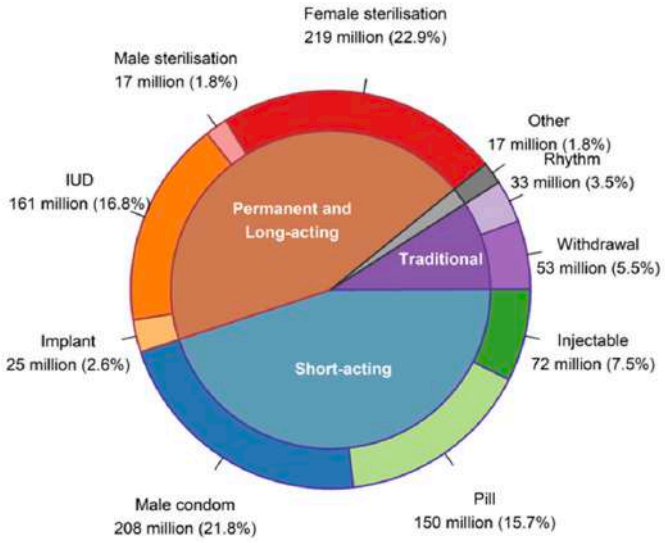
EngenderHealth's initial work on no-scalpel vasectomy focused on vasectomists experienced in large ongoing vasectomy services. However, with the expansion of clinical training to other countries, it has become clear that new doctors receiving training for the first time should be trained only in the no-scalpel technique.

World Vasectomy Day, as an organization that promotes male participation in contraception through vasectomy, has an established commitment not only to the popularization of the procedure but also to the training of professionals needed to expand access to vasectomy services.

2.3. Use of Vasectomy around the World

Throughout the world, the discrepancy between vasectomy and tubal ligation is very marked. Data compiled in 2019 by the Population Division of the United Nations Department of Economic and Social Affairs shows that 16 million women of reproductive age (between 15 and 49 years old) used vasectomies as a contraceptive method, compared to 219 million who resorted to tubal ligation. There are only eight countries in which the use of vasectomy is equal to or more common than tubal ligation as a contraceptive method: Republic of Korean, Canada, the United Kingdom, New Zealand, Bhutan, the Netherlands, Denmark and Austria.

Although vasectomy and tubal ligation are both permanent forms of contraception, vasectomy has several advantages (lower cost, less pain, less complications, and faster recovery).



Sources: Calculations based on United Nations, Department of Economic and Social Affairs, Population Division (2022). *World Contraceptive Use 2022*; United Nations, Department of Economic and Social Affairs, Population Division (2022). *Estimates and Projections of Family Planning Indicators 2022*.
Note: Other methods include female condoms, vaginal barrier methods (including diaphragms, cervical caps, and spermicidal foams, jellies, creams and sponges), lactational amenorrhea method (LAM), emergency contraception, and other modern or traditional methods

2.4. Advantages and Limitations of Vasectomy in Comparison with Other Contraceptive Methods

Advantages of Vasectomy:

- Safe, discreet and highly effective.
- Less invasive, fewer complications than tubal ligation.
- Cost-effective, simple and safe.
- Minimal recovery time.
- Doesn't require making decisions or taking actions that interrupt sexual activity.
- No hormonal changes.
- No long-term side effects on health or sexual function.
- Allows male to access contraception and shares contraception responsibility.
- Does not interfere with libido, erection or ability to ejaculate.
- No need to think about family planning after sterility is confirmed (freedom of mind).

Limitations:

- Should be considered as permanent and irreversible.
- Possibility of changing mind about desire to conceive children later on.
- Possible short term surgery related complications (pain, bruising, swelling, vasovagal reaction, infection).
- Not immediately effective: Patients need to use alternative contraception until absence of live sperm is confirmed through a post-vasectomy semen analysis.
- Does not protect against sexually transmitted diseases.
- Need of vasectomy facilities and trained providers to improve access.
- Time off work for surgery, recovery time and maybe travel time.
- Persistent myths and misconceptions about vasectomy need to be debunked.

3. Ethical and Legal Aspects of Vasectomies

General Objective

To develop participants' understanding of the ethical and legal principles surrounding vasectomy procedures, ensuring patient rights, informed decision-making, and compliance with regulatory standards.

Specific Objectives:

By the end of this module, participants will be able to:

1. Explain the ethical principles underlying vasectomy services, including autonomy, confidentiality, and informed consent.
2. Describe the legal requirements and regulations governing vasectomy practices in their local and international context.
3. Identify the elements of valid informed consent for vasectomy and ensure its proper documentation.
4. Address common ethical dilemmas, such as coercion, partner involvement, and patient regret, in vasectomy counseling and practice.
5. Implement strategies to ensure compliance with ethical and legal standards in vasectomy service delivery.

3.1. Ethical Principles in Vasectomy Services

The ethical foundation of vasectomy services ensures that patient autonomy, dignity, and rights are respected throughout the care process.

Key principles include:

Autonomy:

- Patients have the right to make informed decisions about their reproductive health.
- Providers must respect the patient's choice, even if it differs from the provider's personal beliefs.

Beneficence and non-maleficence:

- Providers are obligated to act in the patient's best interest by offering safe, evidence-based care.
- Minimize harm by adhering to clinical guidelines and ensuring proper follow-up.

Confidentiality:

- Patient information, including the decision to undergo vasectomy, must be kept confidential.
- Only share patient data with consent or when legally required.

Providers should approach every case with empathy, professionalism, and a commitment to equitable care, regardless of the patient's background or social status.

3.2. Legal Framework for Vasectomy Services

Vasectomy practices must adhere to local, national, and international legal standards to protect both patients and providers.

Age and Consent Laws:

- Patients must meet the legal age of consent, which varies by jurisdiction.
- Ensure that consent is voluntary, informed, and obtained without coercion.

Provider Licensing and Training:

- Providers must have appropriate training and certification to perform vasectomies.
- Clinics must be licensed and meet regulatory standards for infection control and safety.

Documentation Requirements:

- Consent forms must include:
  - A clear explanation of the procedure, risks, and benefits.
  - Acknowledgment of the procedure's permanence.
  - Signatures from both the patient and the provider.

Legal Protections:

- Providers should understand the legal protections available to them, such as documentation of informed consent, to safeguard against malpractice claims.

3.3. Informed Consent

Definition and Importance:

Informed consent is a legal and ethical process in which the patient voluntarily agrees to undergo the vasectomy after understanding:

- The procedure and its permanence.
- Risks (e.g., infection, hematoma, rare complications).
- Benefits (e.g., highly effective contraception).

Key Components of Informed Consent:

Information Disclosure

- Provide all relevant information in clear, understandable language.
- Discuss alternative contraceptive options and their effectiveness.

Competence

- Ensure the patient is mentally capable of making an informed decision.

Voluntariness

- Confirm the decision is free from coercion by anyone, including family, partners, or institutions or providers.

3.4. Documentation of Consent

- Use standardized forms that comply with local laws.
- Include details of the counseling session and patient acknowledgment.

More is presented in Chapter 4 on Pre-procedure Assessment and Counseling. Sample pre-procedure evaluation forms and consent forms can be found here:

https://www.vasdoc.org/consents-and-forms/ .

3.5. Addressing Ethical Dilemmas

Coercion and Voluntariness:

- Patients may feel pressure from family or cultural expectations.
- Providers must ensure the decision to undergo vasectomy is entirely the patient's.

Partner Involvement:

- While partner input can be encouraged, it is not legally required for the procedure.
- Emphasize that the ultimate decision rests with the patient.

Managing Regret:

- Some patients may experience regret after the procedure.
- Proper counseling on the permanence of vasectomy and alternative options can help minimize this risk.

Cultural Sensitivities:

- Providers must adapt counseling and care approaches to align with the cultural and social context of their patients while ensuring ethical care.

3.6. Reinforcement of Ethical and Legal Standards

Provider Responsibilities:

- Uphold ethical standards in every interaction with patients.
- Stay informed about updates to legal and regulatory requirements.

Patient Empowerment:

- Empower patients to make decisions that align with their values and family planning goals.

Documentation and Communication:

- Maintain clear and accurate documentation of counseling, consent, and procedures.
- Ensure open communication with patients to build trust and transparency.

4. Pre-procedure Assessment and Counseling

General Objective

To equip participants with the skills and knowledge to provide effective patient-centered counseling, obtain informed consent for vasectomy, and perform a thorough pre-procedure assessment.

Specific Objectives:

By the end of this module, participants will be able to:

1. Explain vasectomy as permanent contraception, its fertility implications, and the necessity of post-vasectomy semen analysis (PVSA) to confirm sterility.
2. Identify key medical history concerns and perform a focused genital exam to assess contraindications and surgical suitability.
3. Describe potential complications, failure rates, psychological impacts, and strategies to mitigate risks.
4. Recognize conditions requiring delay, necessity of lab tests, antibiotic use, and preoperative medication adjustments.
5. Discuss partner involvement, pre-existing pregnancy considerations, and alternative contraceptive options.
6. Explain anxiolytics, nitrous oxide, and other strategies for patient comfort during the procedure, when and where available.

4.1. Pre- Procedure Assesment and Informed Consent

There should be a discussion with the patient before the vasectomy. Like any surgical procedure, a vasectomy requires an interactive discussion about risks, benefits, and alternatives.

The success of counseling hinges on effective communication. Use techniques such as active listening, open ended questions, empathy, and reassurance.

Patients who choose a vasectomy are choosing to make a permanent change in their fertility status. Some patients may later regret this decision. Therefore, a thoughtful preoperative discussion is important. The goal of this discussion is to ensure that the patient has appropriate expectations regarding the preoperative, operative and postoperative consequences choosing a vasectomy.

The surgeon performing the vasectomy should obtain a general medical history, with special emphasis on any bleeding diathesis and other possible contraindications to the procedure. For example, if a patient requires chronic anticoagulation and the risks of discontinuing anticoagulation are significant, then the surgeon and patient should consider alternative methods of family planning. A pre-procedure assessment should be performed that includes the following:

Reproductive Health:

- Assess the patient's reasons for seeking a vasectomy and their family planning goals.

Chronic Conditions:

- Identify any ongoing medical issues such as uncontrolled diabetes or bleeding disorders.

Previous Surgeries or Injuries:

- Evaluate past scrotal surgeries or trauma that may affect the procedure.

Medication Use:

- Review the patient's current medications, particularly anticoagulants or antiplatelet agents, as these may require adjustment before the procedure.

A physical examination of the genitals should be performed before vasectomy. This examination may be performed immediately before the surgical procedure, if the preoperative consultation was not performed in person. Physical examination at the time of the in-person preoperative consultation is useful because it may help identify genital pathology, such as a testicular tumor or an undescended testicle, which contraindicates routine bilateral vasectomy. Additionally, the physical examination may identify patients who are not good candidates for local anesthesia due to unusual scrotal tenderness, patients who are too uncomfortable or too anxious to tolerate vasectomy under local anesthesia, or patients whose vasa are especially difficult to palpate.

According to American Urological Association (AUA, 2012), the minimum necessary concepts that should be discussed in a preoperative vasectomy consultation include the following:

- Vasectomy is considered a permanent form of contraception.
- Vasectomy does not produce immediate sterility.
- After vasectomy, another form of contraception is required until duct occlusion is confirmed by post-vasectomy semen analysis (PVSA).
- Even after confirming vas deferens occlusion, vasectomy is not 100% reliable in preventing pregnancy.
- The risk of pregnancy after vasectomy is approximately 1 in 2000 for men who have post-vasectomy azoospermia or PVSA showing rare non-motile sperm (RNMS) (defined as ≤100,000 sperm/ml).

- Repeat vasectomy is necessary in ≤1% of vasectomies, provided that a technique for vas occlusion known to have a low occlusive failure rate was used.
- Patients should refrain from ejaculating for about a week after vasectomy.
- Options for fertility after vasectomy include vasectomy reversal and sperm retrieval from the testicle, with in vitro fertilization. These options are not always successful, can be very expensive, and not always locally available.
- Rates of surgical complications such as symptomatic hematoma and infection are 1 to 2%. These rates vary depending on the experience of the surgeon and the criteria used to diagnose these conditions.
- Chronic scrotal pain associated with a negative impact on quality of life occurs after vasectomy in approximately 1-2% of men. Few of these men require additional surgery to improve their symptoms.
- The benefits and risks of other permanent contraceptive methods (e.g. tubal sterilization) and/or non-permanent options should be reviewed for the patient (e.g. barrier methods) and the partner (e.g. oral or injectable contraceptives, and barrier methods).
- If the female partner is pregnant at the time of the preoperative consultation, the couple may be advised to consider delaying vasectomy until after delivery to avoid vasectomy regret, which could occur if the pregnancy is lost unexpectedly.

4.2. Precautions and contraindications

The following are conditions that require a delay of the procedure or special precautions:

- Local infection: including scrotal skin infection, active sexually transmitted infection (STI), balanitis, epididymitis or orchitis.
- Previous scrotal injury altering the anatomy of the vas deferens.
- Cryptorchidism.
- Mass such as inguinal hernia or large hydrocele.
- Systemic infection or gastroenteritis.
- Filariasis, scrotal elephantiasis.
- Bleeding disorders.
- Uncontrolled diabetes.
- AIDS (HIV positive status without AIDS is not a concern).

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

4.2.1. Minimum age

The minimum age requirement for vasectomy should be that of legal consent in the jurisdiction in which the procedure is performed. The prospective vasectomy patient must, at a minimum, be of the legal age of consent under applicable legal statutes. Access to a vasectomy procedure should not be restricted based on the patient's age or number of children he's fathered.

4.2.2. Partner Involvement

Any adult male of legal age to consent to the procedure can proceed with a vasectomy without consulting a partner. However, because a potential vasectomy patient's decision affects the fertility options for both him and a partner or spouse, it is suggested to include the partner in the preoperative consultation and decision-making process. However, the partner's permission is not necessary or required to perform the procedure.

4.2.3. Dissatisfaction and Regret

Rates of dissatisfaction with vasectomy and/or regret for having undergone the procedure are in the range of 1-2%. It is estimated that 80 to 100% of vasectomized men recommend the procedure to others.

In the few studies that have assessed reasons for dissatisfaction or regret, the most reported reason is the desire to have more children.

4.3. Laboratory Tests

Preoperative laboratory testing is not required for vasectomy patients, unless the patient's medical history suggests they may be necessary to evaluate the patient's suitability for the vasectomy procedure.

Preoperative coagulation testing should be considered only if the patient has a history of liver disease, bleeding diathesis, or is taking anticoagulants.

4.4. Preoperative Antibiotics

Prophylactic antimicrobials are not indicated for routine vasectomy.

When operating on certain patients who have comorbidities associated with a particularly high risk of infection, the surgeon should consider the use of prophylactic antimicrobials.

4.5. Use of anti-inflammatories

Patients should avoid taking aspirin for 7 days and nonsteroidal anti-inflammatory drugs for 2-3 days before the procedure, as these may increase the risk of postoperative bleeding.

4.6. Management of Operative Anxiety

The administration of an oral anxiolytic (e.g., diazepam 10mg orally or alprazolam 0.5-1 mg orally) can be considered 1-2 hours before the procedure to relax the patient. Another option is the use of inhaled nitrous oxide during the procedure, where available.

The use of anxiolytics can help with surgical isolation of the vas deferens by relaxing the scrotal and cremaster muscles. Although the use of anxiolytics is the exception, it could be a good alternative to the administration of general anesthesia in certain cases. When using anxiolytics, informed consent should be obtained before administration of the medication.

4.7. Resources

Sample pre-procedure evaluation forms and consent forms can be found here: https://www.vasdoc.org/consents-and-forms/

5. Infection Prevention

General Objective

To equip participants with the knowledge and skills to implement effective infection prevention practices during vasectomy procedures, ensuring patient safety, minimizing complications, and maintaining high-quality care.

Specific Objectives:

By the end of this module, participants will be able to:

1. Understand the principles of infection control.
2. Describe proper hand hygiene and personal protective measures.
3. Outline skin preparation.
4. Explain sterilizing to minimize infection.
5. Discuss environmental disinfection.
6. Detail proper wound care and post-operative management.
7. Understand waste disposal and biohazard management.
8. Explain the data behind not using prophylactic antibiotics.

5.1. Importance of Infection Prevention in Vasectomy

Key Goals:

Protect the patient and provider from infections, including surgical site infections and bloodborne pathogens (e.g., HIV, Hepatitis B/C).

Key Goals:

- Reduces postoperative complications.
- Enhances patient trust and satisfaction.

5.2. Hand Hygiene

Proper hand hygiene before surgery is essential to prevent infections and maintain a sterile environment. Hands should be washed thoroughly with antimicrobial soap and water for at least 20–30 seconds, ensuring all surfaces, including fingernails and between fingers, are cleaned. If hands are not visibly soiled, an alcohol-based hand rub can be used as an alternative. After drying, sterile gloves should be worn to maintain asepsis throughout the procedure.

5.3. Skin Preparation

Before a vasectomy, proper skin preparation is essential to minimize the risk of infection. The scrotal area should be cleaned with an antiseptic solution such as chlorhexidine or povidone-iodine, applied in a circular motion from the center outward. Patients are typically advised to shave or trim the scrotal area beforehand to reduce bacterial load and facilitate the procedure excessive shaving should be avoided to prevent microabrasions that could harbor bacteria. If necessary, a patient can be shaved just before a vasectomy, though with careful attention to avoid skin nicks.

5.4. Sterilizing Instruments

Proper disinfection and sterilization of vasectomy instruments are essential to prevent infections, ensure patient safety, and maintain high medical standards. Inadequate sterilization can lead to post-procedure complications such as surgical site infections or transmission of pathogens.

Thorough cleaning, followed by autoclaving or chemical sterilization, ensures that all instruments are free from contaminants. Adhering to strict sterilization practices not only protects patients but also upholds the credibility and professionalism of the medical provider.

5.4.1. Proper Technique for Cleaning and Sterilizing Vasectomy Instruments

Different types of vasectomy instruments require specific sterilization and disinfection methods to ensure safety and effectiveness.

- Stainless steel instruments, such as forceps, must be thoroughly cleaned and sterilized to eliminate all microbial contaminants.
- Plastic instruments, like thermo-cautery handles, are heat-sensitive and can not be autoclaved. These must be kept clean and covered by a sterile sheath during the vasectomy.
- Thermocautery tips should be carefully cleaned to remove debris and sterilized by autoclaving or chemical sterilization. (Program for Appropriate Technology in Health (PATH), 2005).
- Fenestrated drapes are usually made from cloth or paper. If cloth, these must be laundered and autoclaved to meet infection control standards. If paper, these must be autoclaved before use unless prepackaged sterile fenestrated drapes are used.

Proper handling of each type ensures a safe and sterile surgical environment.

5.4.2. Steps for Cleaning, Disinfection, and Sterilization

The vasectomist should understand the basic terminology regarding instrument care.

Cleaning:

- **Purpose:** Removes organic material (e.g., blood, tissue) that can interfere with disinfection or sterilization.
- **Process:** Ensure that consent is voluntary, informed, and obtained without coercion.
  - Rinse instruments immediately after use to prevent drying of organic material.
  - Scrub with a brush and detergent under running water.
  - Use enzymatic cleaners for instruments with intricate parts, such as forceps.

Disinfection:

- **High-Level Disinfectants:** Disinfection is the process of reducing the number of viable microorganisms to a level appropriate for further handling. Note that disinfection is very different from sterilization. High-level disinfection is used for instruments that will not undergo sterilization but require a high level of cleanliness. Examples of agents used in high-level disinfection include glutaraldehyde or hydrogen peroxide solutions. The standard of care for vasectomy instruments is sterilization and not high-level disinfection.

Sterilization:

Autoclaving (Preferred Method):

- Uses steam under pressure to sterilize heat-resistant instruments.
- Standard settings: 121°C (250°F) at 15 psi for 15–20 minutes.

Dry Heat Sterilization:

- Suitable for heat-stable instruments if autoclave is not available.
- Standard settings: 160–170°C (320–338°F) for 1–2 hours.

Chemical Sterilant:

- Use for heat-sensitive instruments, such as components of the thermal cautery device.
- Examples include ethylene oxide gas or liquid glutaraldehyde. It is crucial to follow the instructions regarding exposure times for chemical sterilants. While glutaraldehyde is usually a high-level disinfectant, short exposure times are not sufficient for sterilization.

5.4.3. Quality Control

Vasectomists should have in place a system to monitor and review the proper cleaning and sterilization of instruments. Appropriate systems include training of staff, use of checklists, and continuous monitoring to provide a high level of care and prevent infections.

5.5. Environmental Disinfection

Environmental disinfection is essential in maintaining a clean and safe setting for performing vasectomies, reducing the risk of infections.

Surfaces, including exam tables, instrument trays, and high-touch areas, should be disinfected regularly using medical-grade disinfectants. Proper ventilation and hand hygiene further enhance infection control. While vasectomy is a minor procedure, maintaining a clean environment - through routine cleaning protocols and adherence to infection prevention guidelines - helps ensure patient safety and optimal outcomes.

5.6. Waste Disposal and Biohazard Management

Proper biomedical waste disposal after a vasectomy is essential for infection control and environmental safety. Needles should be disposed of in a rigid, puncture-proof container following local regulations. Any contaminated gauze, gloves, disposable drapes, and other waste should also be discarded in accordance with local guidelines to prevent contamination and ensure proper handling of medical waste. Adhering to these protocols helps maintain a safe and hygienic clinical environment.

5.7. Prophylactic Antibiotics

Prophylactic antibiotics are not necessary after a no-scalpel vasectomy, as the risk of infection is minimal when proper aseptic techniques are followed. There is no significant reduction in post-vasectomy infection rates with routine antibiotic use. Instead, adherence to standard infection prevention measures - such as instrument sterilization, environmental disinfection, and proper wound care - effectively minimizes the risk of complications. Avoiding unnecessary antibiotics also helps prevent antimicrobial resistance and reduces the risk of side effects.

6. Anatomy and Physiology

General Objective

To provide participants with a comprehensive understanding of the anatomy and physiology of the male reproductive system, focusing on structures relevant to the vasectomy procedure, to ensure precision and safety during clinical practice.

Specific Objectives:

By the end of this module, participants will be able to:

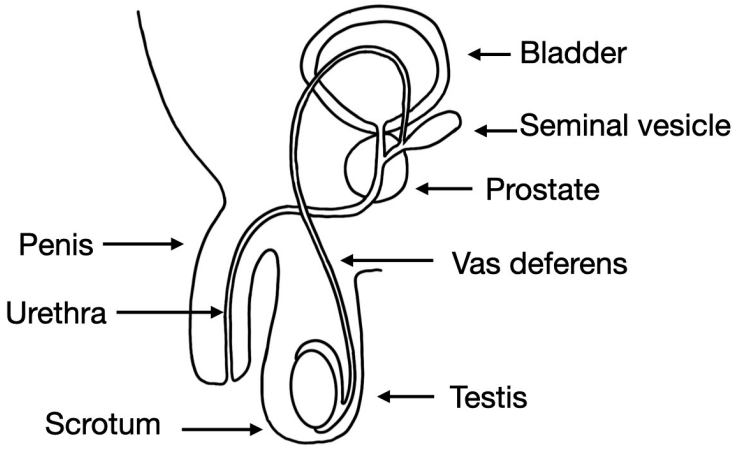
1. Identify the anatomical structures of the male reproductive system, including internal and external components, and their functions.
2. Describe the anatomical position and layers of the scrotum, vas deferens, and surrounding structures relevant to vasectomy.
3. Explain the physiological processes of sperm production, transport, and ejaculation, and how vasectomy interrupts this process.
4. Recognize anatomical variations and abnormalities that may affect vasectomy procedures.
5. Use anatomical knowledge to enhance accuracy and minimize complications during the vasectomy procedure.

6.1. Overview of the Male Reproductive Anatomy

The male reproductive system is sometimes described as only the penis, scrotum, and associated organs. A more complete discussion though, includes the brain, the nerves of the spinal cord and periphery, and the circulatory system. This complex interplay among these various components is important during vasectomy counseling when discussing sex drive and erections. For example, sexual function (libido, etc) is driven largely by the brain. Erections are a function of the nervous system and circulatory system working together to provide sufficient blood to the penis, in addition to an intact penis able to receive blood. Performing a vasectomy does not affect the nervous system or the circulatory system, thus libido and erections are mostly unchanged after vasectomy.

6.1.1. Male Genitalia

The male reproductive organs which are specifically called genitalia are the penis, the scrotum and its contents, and the prostate and seminal vesicles.



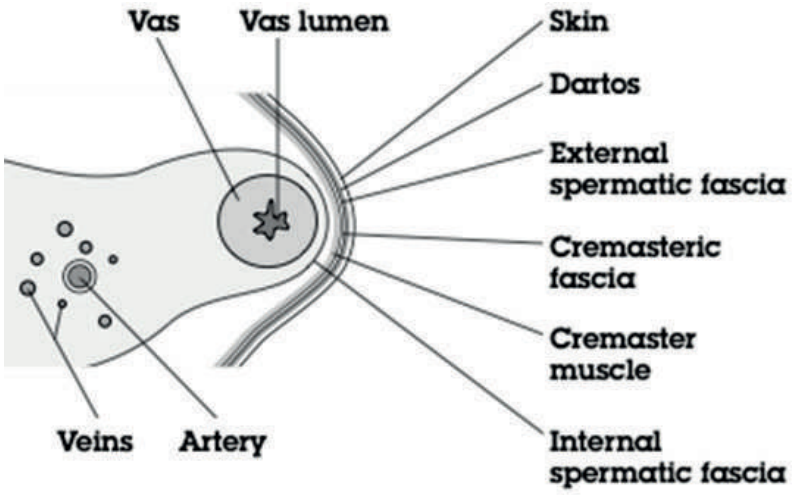
(John Curington, 2025)

6.1.2. Penis

The penis houses the urethra, the passage for both urine and semen. The corpora cavernosa are spongy structures that fill with blood during arousal, and the tunica albuginea is the fibrous sheath that surrounds the corpora cavernosa.

6.1.3. Scrotum

The scrotum is a pouch that houses the testicles. The scrotum protects and regulates the temperature of the testes. The scrotum is composed of skin with underlying muscle, primarily the dartos muscle which allows the scrotum to change shape depending upon the temperature. The scrotal contents include the testes, the epididymides, and the spermatic cords. The spermatic cord includes the vas deferens, the testicular artery, the pampiniform plexus, lymphatics, and nerves. The key points for the vasectomist are that within the spermatic cord, there are many structures besides the vas deferens of interest to vasectomy providers. We'll discuss at a later point how to move the vas deferens anteriorly to avoid these other structures.



Layers of the Scrotum
(Engender Health, 2007)

For the vasectomist, it is important to understand the layers that are encountered from the skin down to the vas. The outermost layer is the skin, just below which is the dartos muscle which contracts to wrinkle the skin and to aid in temperature control. The external spermatic fascia provides structural support for the spermatic cord. The cremaster muscle moves the testes closer to the body during cold temperatures or arousal. The cremaster muscle is mostly located in the superior aspect of the scrotum and thus is not usually encountered during a vasectomy. The internal spermatic fascia is a deeper connective tissue layer surrounding the testicular structures. The perivasal fascia is the delicate fascia that surrounds the vas deferens itself.

6.1.4. Testes

The testicles, also called testes, are the site of production of both sperm and testosterone. Sperm exits the testes through the epididymis to the vasa, whereas testosterone exits the testes through the circulatory system.

6.1.5. Epididymis

The epididymis is a coiled tubular structure attached to each testis. Sperm mature in the epididymis and move on to the vas deferens. The plural of epididymis is epididymides.

6.1.6. Vas Deferens

The muscular tube that transports sperm from the epididymis to the ejaculatory ducts for eventual release. There are two of these tubes, one for each testis.

The plural of vas is vasa. The plural of vas deferens is vasa deferentia. The part of the vas nearest the epididymis is curvy and is called the convoluted vas deferens. The vas deferens is part of the spermatic cord, which also contains blood vessels, nerves, and lymphatics. The vas is the primary target during vasectomy, and its isolation is a critical step in the procedure.

6.2. Physiology of the Male Reproductive System

The brain is the primary driver of libido and arousal. Nerves carry impulses from the brain and the cardiovascular system provides blood for erections.

Sperm production occurs in the testes, and then the sperm mature in the epididymides. Sperm travel through the vasa to the prostate and seminal vesicles, where they mix with semen before ejaculation.

Vasectomy interrupts this pathway by blocking the vasa, preventing sperm from entering the semen. This does not affect testosterone production, sexual function, or the ability to ejaculate, as most semen volume comes from the prostate and seminal vesicles.

6.3. Anatomical Variations and Abnormalities

While the male reproductive anatomy is consistent across most individuals, some variations and abnormalities can affect vasectomy procedures:

Common Variations:

- Thickened scrotal skin and obesity can cause difficulty in palpating the vas deferens.

Abnormalities:

- Several scrotal abnormalities are important for the vasectomist to understand. In cryptorchidism, a testis fails to descend into the scrotum before birth. If this has not been repaired, the vasectomist will not be able to find the testis, and a vasectomy can not be performed.

If the undescended testis has been repaired through an orchiopexy, there may be significant scarring on that side that leads to a more difficult vasectomy.

A varicocele is an enlarged vein within the spermatic cord. This is often not palpable when the patient is lying down and usually causes no problems during a vasectomy.

A hydrocele is a collection of fluid in the scrotum between the visceral and parietal layers of the tunica vaginalis. If a hydrocele is small, the vasectomist can still perform a vasectomy. In cases of a large hydrocele, an experienced vasectomist can drain the hydrocele just before the vasectomy, though a beginner should not perform a vasectomy if the vas deferens is not easily palpable.

6.3.1. Application of Anatomy in Vasectomy

A thorough understanding of anatomy is critical for accurate vas isolation and occlusion during a vasectomy. Providers should palpate and identify the vas deferens precisely to be able to avoid the surrounding structures. Providers must be aware of the proximity of blood vessels and nerves to minimize complications.

7. Vasectomy Techniques

General Objective

To equip participants with the technical knowledge and practical skills required to perform a no-scalpel vasectomy (NSV) safely, effectively, and with minimal patient discomfort.

Specific Objectives:

By the end of this module, participants will be able to:

1. Identify the instruments used in the NSV procedure and their specific functions.
2. Describe the step-by-step procedure for performing a no-scalpel vasectomy (NSV), including the three-finger technique, anesthesia with mini-needle, vas isolation/delivery with the NSV technique and occlusion combined with mucosal thermal cautery and fascial interposition.
3. Recognize and address intraoperative challenges including anatomical variations.
4. Emphasize the importance of patient communication and comfort during the procedure.

7.1. No-Scalpel Vasectomy (NSV) Overview

The NSV technique involves the following key steps:

Preparation:

- Position the patient supine on the procedure table.
- Prepare the surgical site with antiseptic solution and sterile drapes.

1 Local Anesthesia

- Identify the vas deferens through the scrotal skin and isolate it using the three-finger technique.
- Administer local anesthesia using the mini-needle technique, targeting the vas deferens and surrounding tissues.

2 Vas Isolation

- Isolate the vas using the three-finger technique.
- Stabilize the vas under the median raphe with the ringed forceps.

3 Vas Delivery

- Use the Li dissecting forceps to puncture the skin.
- Deliver (expose) the vas deferens through the skin opening.

4 Vas Occlusion:

Apply both of the following occlusion techniques:

- Mucosal Cauterization (MC): Seal the ends of the vas using a thermal cautery device.
- Fascial Interposition (FI): Place a layer of connective tissue between the severed ends of the vas to prevent recanalization.

5 Completion:

- Ensure hemostasis.
- Return the vas deferens to its anatomical position.
- Apply a sterile dressing to the puncture site, which will heal naturally without sutures.

7.2. NSV Instruments

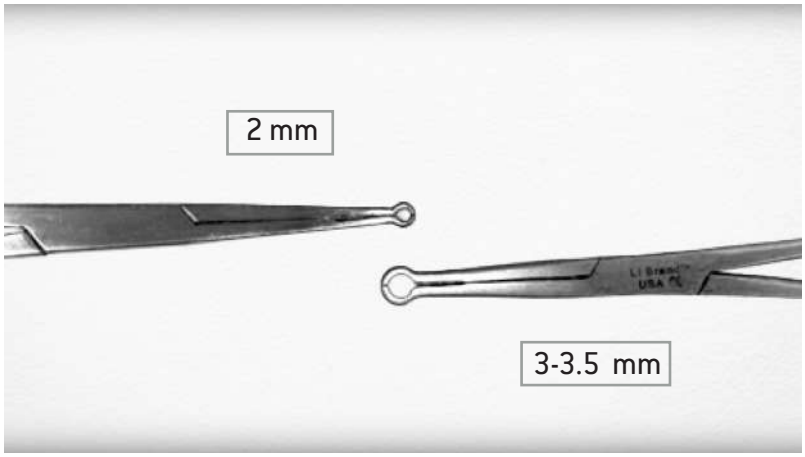
The no-scalpel technique described in this document requires four instruments, two of which were specially designed by Dr. Li Shunqiang.

7.2.1. Extra-cutaneous ringed forceps

This is a type of surgical clamp used to secure the vas deferens. For clarity, the term “ring forceps” will be used in this document. Throughout the procedure, the surgeon uses the ringed tip of this instrument to surround and grasp the vas deferens, without damaging the skin.

The ring forceps grasps the vas deferens both extracutaneously and directly. This instrument comes in different ring sizes: 2.0 mm, 3.0 mm, 3.5 mm and 4.0 mm. These different diameters adapt to different thicknesses of vasa and scrotal skin. A 3.0 to 3.5 mm ring forceps is generally sufficient to perform most procedures.

Ring Forceps
(designed by Dr. Li)



Ring Forceps Size

7.2.2. Li Dissecting Forceps

They are similar to a curved mosquito hemostat, except that the tips are pointed. They are used to pierce the skin of the scrotum, spread the tissues, dissect the sheath, and deliver the vas deferens.

The dissecting forceps can also be used to hold 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 document, the term “Li forceps” will be used to refer to this instrument.

Li Forceps
(designed by Dr. Li)

7.2.3. Straight Hemostatic Forceps without Teeth

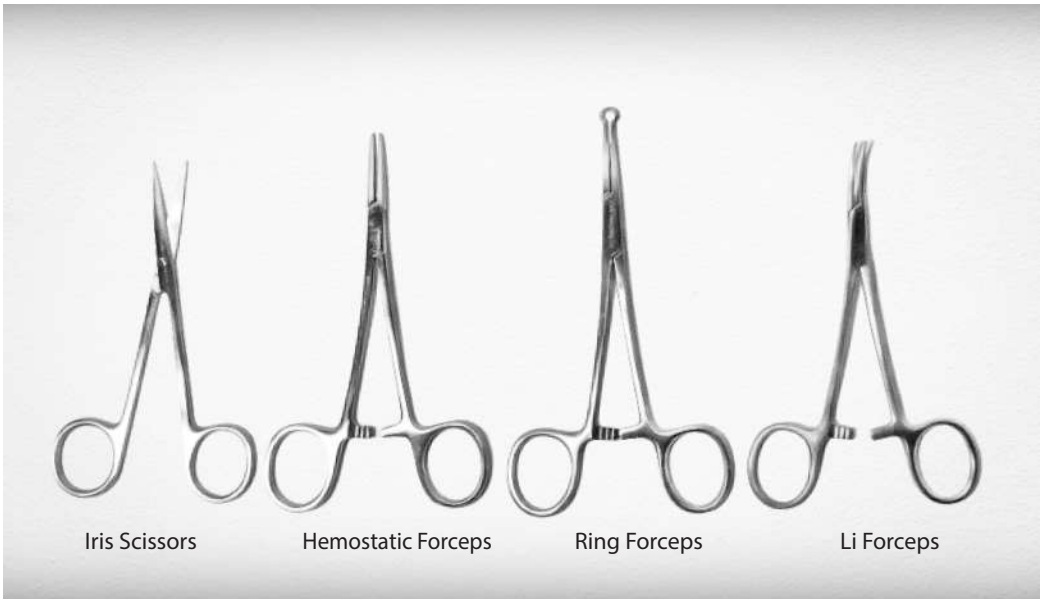
Also described as mosquito hemostatic forceps, these forceps are necessary for fascial interposition and as a tool for hemostasis.

Mosquito Forceps

7.2.4. Surgical Scissors

These are used for cutting of the vas deferens and sutures.

Surgical Scissors



Instrumentation required for vasectomy

7.2.5. Battery-powered Thermal Cautery

In addition to the four NSV instruments, a thermal cautery device is needed to seal, or occlude, the vas deferens; thus preventing the release of sperm during ejaculation. Below is the picture of such a device that works with regular AA type batteries. The tip of the device, in the lumen of the vas deferens, dries the luminal mucosa of the vas to create a firm scar that occludes the vas.

Thermal cautery

7.3. Preparation

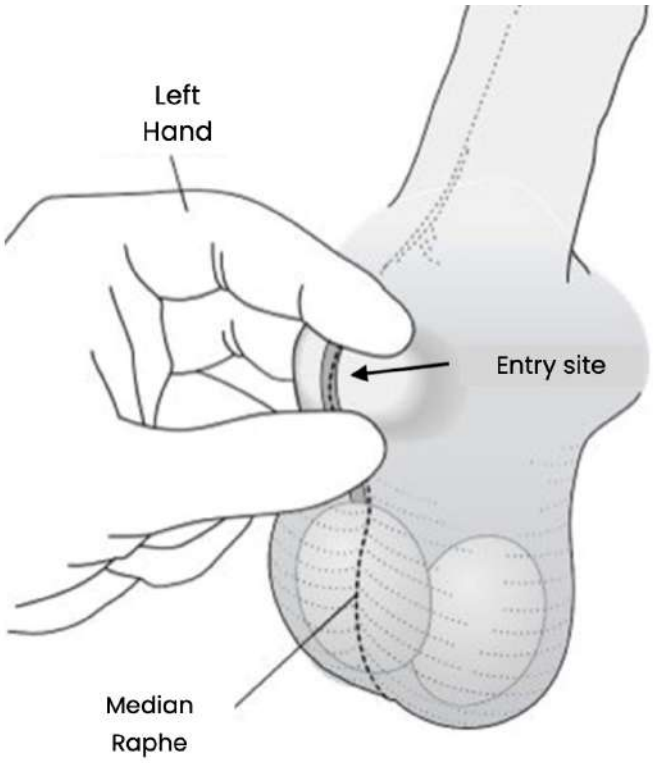
The patient is positioned on the procedure table. Right-handed surgeons will stand on the right side of the patient and left-handed surgeons on the left side. A surgical light is not necessary but adequate lighting is essential to perform the procedure.
Prepare the surgical site with antiseptic solution and sterile drapes as described in the infection prevention module.

7.4. The Three-finger Technique to Isolate the Vas Deferens

The three-finger technique to identify and isolate the vas deferens is the first essential step needed to master for performing the local anesthesia with the mini-needle, and then the NSV procedure.

1. Stand on the right side of the patient (if the operator is right-handed)
2. For the right vas deferens:

   a. Place your left thumb approximately halfway between the top of the testicles and the base of the penis at the median raphe. With the middle finger of the left hand under the scrotum, palpate the duct and slide it towards the median raphe under the thumb.
   b. Hold the vas deferens in position between your thumb and middle finger while placing your left index finger on top of the scrotum, slightly above your thumb.



"Three-Finger Technique" for the Right Vas
(Engender Health, 2007)

c. Note that your fingers should be perpendicular to the vas deferens. The upward pressure from the middle finger, combined with the downward pressure exerted by the index finger, creates a curve in the vas to facilitate entry for its exposure. Maintain a three-finger grip when administering anesthesia to the right side.

3. For the isolation of left vas, the position of the hands will be reversed.

a. To hold the patient's left vas with the three-finger technique while standing on their right side, you will feel more comfortable if you step toward the patient's head and turn slightly to face their feet. To approach the vas deferens from this lateral position, pass your left hand over the patient's abdomen.
b. For a right-handed operator, isolating the left duct may be more difficult and uncomfortable than isolating the right vas. It may take time and practice to master. A left-handed operator will need to reverse these positions and therefore may find it more difficult to isolate the right vas.

Three-Finger Technique" for the Left Vas
(Engender Health, 2007)

Remember: If you are right-handed, remember to face the patient's feet when grasping the left vas and their head when grasping the right vas. Reverse for left-handed surgeons.

If you have difficulty isolating the vas…

- For a tight scrotum: A glove filled with warm water and applied to the scrotum, and having the patient sit up partially, may help loosen the scrotal muscles.
- For the tight dartos: You can relax the dartos by simultaneously taking a 3-4 cm pinch of skin ACROSS the midline, just below the base of the penis with one hand and gently pulling down along the midline with the other hand (about 5 cm caudally) to stretch the skin.
- For a difficult to palpate vas: To find a difficult vas, start at the lower pole of the testis and palpate along the medial side to where the vas emerges from the tail of epididymis.

The following documents provide additional "tricks" to isolate a difficult vas:

ISOLATING-THE-VAS-RIGHT-HANDED-OPERATOR-CHALLENGING-PATIENT-.PDF
https://www.vasdoc.org/wp-content/uploads/2020/10/isolating-the-vas-right-handed-operator-challenging-patient-.pdf

ISOLATIING-THE-VAS-DEFERENS-LEFT-HANDED-OPERATOR-THICK-SCROTUM.PDF
https://www.vasdoc.org/wp-content/uploads/2020/10/Isolatiing-the-vas-deferens-left-handed-operator-thick-scrotum.pdf

7.5. Anesthetic Administration with the Mini-needle Technique

7.5.1. Selection of Anesthetic and Supplies

Prepare a 3-cc syringe to administer 2 cc of lidocaine 2% without epinephrine. This amount should be sufficient for anesthesia with a vasal block and skin anesthesia in most clients. Attach a small gauge 0.5 or 1 inch (13mm or 25mm) needle to the syringe. A 30-gauge needle is recommended for minimal patient discomfort.

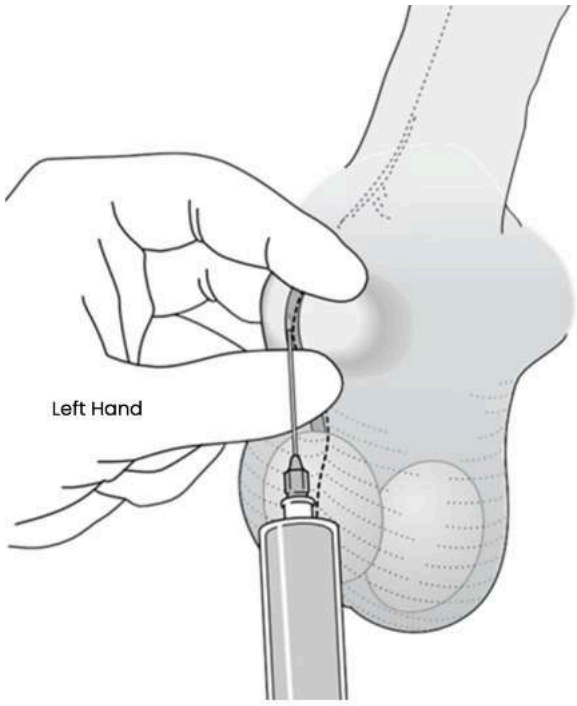
Epinephrine is not recommended because it constricts blood vessels and causes less apparent bleeding at the time of surgery. It is best to be able to detect and control all bleeding during the procedure to prevent bruising after the patient leaves the medical facility. If lidocaine does not contain epinephrine, it is more likely to be able to detect and control small bleeding sites during the procedure.

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 does not exceed 300 mg. This is equivalent to 30 cc of 1% lidocaine or 15 cc of 2% lidocaine without epinephrine.

7.5.2. Administration Procedure

Administration of the local anesthetic is crucial for a good patient experience during the procedure. It is imperative that the anesthetic be applied appropriately and sufficiently for a painless vasectomy.

1. The vas deferens is isolated and positioned so that it lies as superficially as possible under the median raphe of the skin of the scrotum, anteriorly, and halfway between the top of the testicles and the base of the penis. This is usually accomplished using the non-dominant hand and the "three-finger technique", already described, to manipulate the vas within the scrotum.
2. Local anesthetic without epinephrine (0.5 ml) is injected into the skin to create a wheal on the skin over the vas deferens. A large wheal should be avoided because it will interfere with the isolation of the vas deferens.



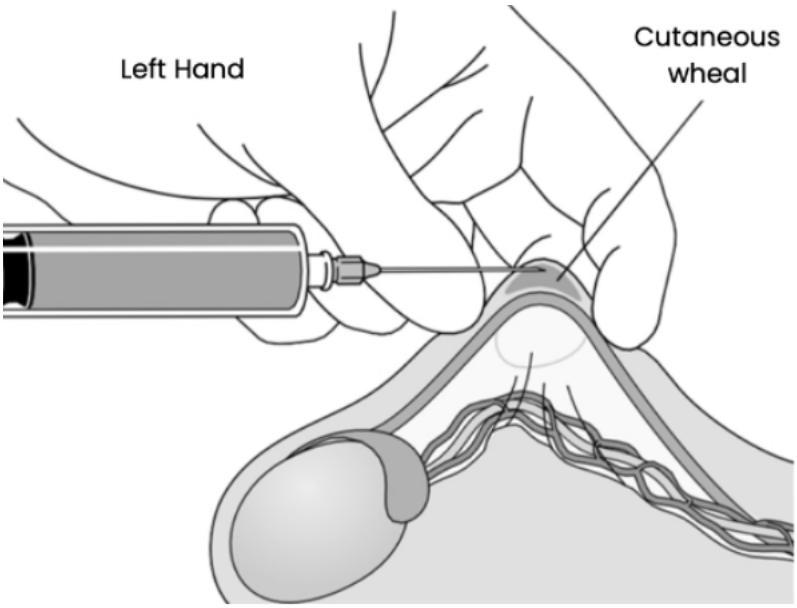
a. The needle entry site should be in the midline, over the vas deferens, and halfway between the thumb and index finger. Use only the tip of the needle to lift a superficial skin wheal, 1 to 1.5 cm in diameter.

"Three-Finger Technique" for Right Vas and Wheal Creation
(Engender Health, 2007)

b. To create the skin wheal, hold the syringe at an angle of about 5 to 15 degrees, with the bevel of the needle facing up. Inject lidocaine into the dermis and subcutaneous tissues. Generally 0.5 cc would be sufficient.

Avoid two potential mistakes when lifting the skin wheal:

1. First, do not inject the lidocaine too deeply. At this point in the procedure, you are anesthetizing only the skin of the scrotum. In the next step, you will create a vasal block that will anesthetize the deeper tissues.
2. Secondly, to avoid swelling around the vas deferens at the puncture site, do not inject more than 1 cc of lidocaine. A persistent wheal will prevent the ring clamp from closing properly around the vas deferens.

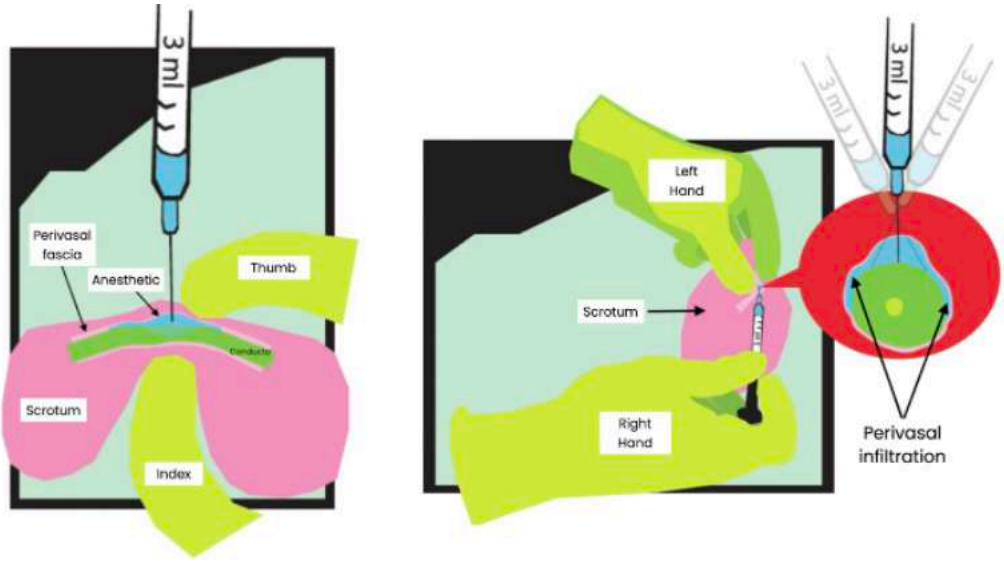


Creation of the "skin wheal"
(Engender Health, 2007)

3. Right vas anesthesia: Using the small numb spot you created, advance the needle directly into the vas deferens. Once you feel the vas deferens with the tip of the needle, inject approximately 0.5-1 ml of lidocaine.

a. The goal is to inject lidocaine into the space just between the vas deferens and the fascia surrounding it.

b. Be sure to anesthetize both sides, using the same technique, before entering the scrotum and occluding the right vas.



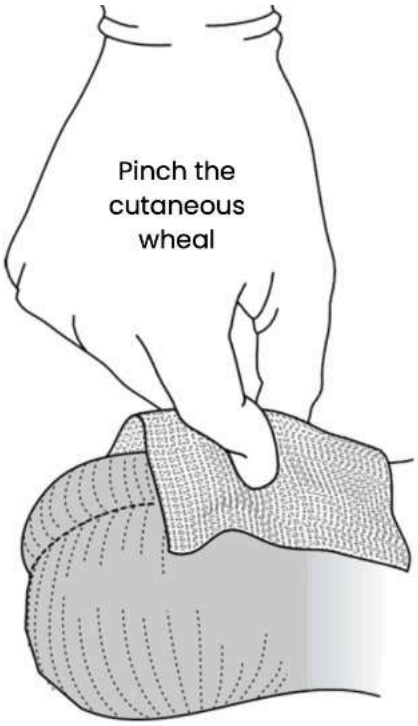
Perivasal anesthetic infiltration scheme
(Michel Labrecque, 2023)

4. Left vas anesthesia: Grasp the patient's left vas using the three-finger technique. Remember to reach your left hand over the patient's abdomen to approach the vas deferens from this lateral position.

   a. Place the left vas deferens below the anesthetized puncture site.
   b. Place your thumb on the top third of the scrotum while your index finger is on the middle third. (This is different from holding with three fingers on the right side). As with the right side, place your middle finger under the scrotum to identify the duct and mobilize it to the puncture site.
   - Notice now that the thumb is above the index finger.

   c. For a right-handed operator, isolating the left vas may be more difficult and uncomfortable than isolating the right vas. It may take time and practice to master. A left-handed operator will need to reverse these positions and therefore may find it more difficult to isolate the right vas.
   d. Repeat the administration of anesthetic as previously described.

5. After removing the needle, gently pinch the skin wheal between your thumb and index finger for a few seconds to reduce its size and soften and thin the local tissues. This can be done using the sterile drape.



"Pinch of the "skin wheal"
(Engender Health, 2007)

6. If the patient feels pain after the surgical procedure begins, inject an additional 0.2 to 0.3 mL directly into the vas on the painful side. Avoid creating another wheal on the skin to avoid edema in the subcutaneous tissue.

7. Additional tip:
   Precisely injecting the lidocaine on the vas is more important than the amount of lidocaine used.

7.5.3. Toxicity or Allergic Reaction to Anesthetic

Definition:

Local anesthetics are necessary in the practice of vasectomies for a simple and painless procedure for the patient. It is important to keep in mind, even though there are no documented cases during anesthesia for vasectomy, the potential for local anesthetic systemic toxicity (LAST) exists. LAST occurs when sodium channels in the heart or the central nervous system are affected. This is rare but can be fatal.

Management

Prevention:

- The total dose of anesthetic administered should be the lowest dose required for the success of the procedure.

Local anesthetics for vasectomy (without epinephrine)			
	Beginning of effect	Duration of effect	Maximum dose
Lidocaine 2%	2-5 minutes	1 hour	4 mg/kg a 300 mg/dosis (15 ml al 2%)*
Bupivicaine 0.5%	5-10 minutes	2-4 hours	2 mg/kg (75 kg → 30 ml of 0.5%)

- When using mini needle for anesthesia, a dose of 2 ml of the anesthetic mixture is generally sufficient for the procedure.

- Administer the anesthetic gradually, in 1 to 2 mL aliquots, with at least 30 to 45 seconds between injections.
- Aspirate the preinjection plunger before each incremental injection, repositioning the needle in case of blood return. This is not required when using a mini needle (30 G needle).

Treatment:

- Identify symptoms: vertigo, cyanosis, perioral paresthesia, seizures, cardiovascular collapse.
- Management consists of basic life support, monitoring and advanced life support (the details of this management are outside the scope of this manual).
- If allergy to local anesthetics is known in advance, an alternative is diphenhydramine 1% solution. This can be used in a similar manner to lidocaine.

7.6. Vas Isolation Technique

Vas isolation is the process of bringing the vas deferens up to the anterior wall of the scrotum, such that the vas is placed in the ring forceps, leaving the major vessels safely out of harm's way.

NOTE: The following instructions and accompanying illustrations are for right-handed operators. Left-handed operators may find it helpful to use a mirror when viewing illustrations designed for right-handed operators.

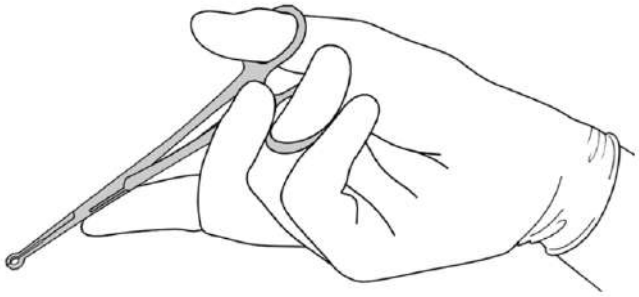
7.6.1. Use of the Ring Clamp

The use of the ring clamp allows isolation and control of the vas deferens.

Ringed forceps for no-scalpel vasectomy
(Engender Health, 2007)

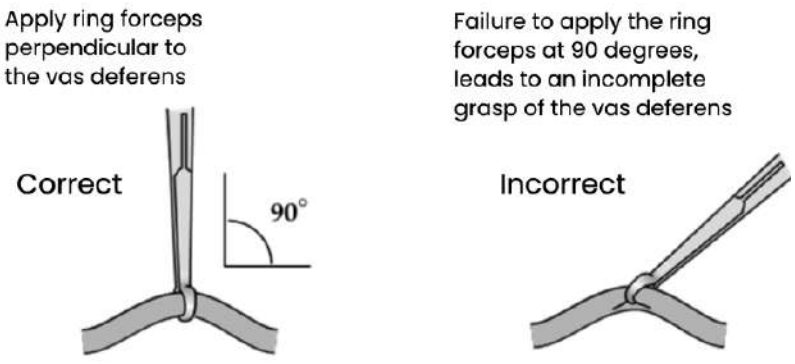
1. When holding the ring clamp, it is important to remember three points:

a. First, for greater control and precision, hold the ring clamp with your palm up and wrist extended.



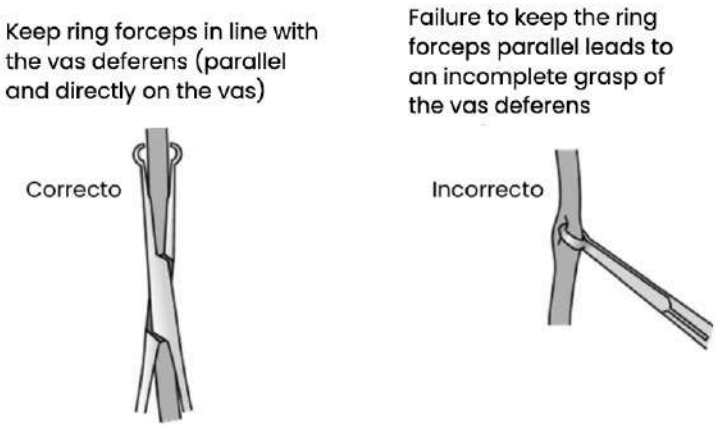
Ring clamp position (palm up)
(Engender Health, 2007)

b. Second, apply the clamp at a 90-degree angle perpendicular to the vas. The palm-up hand position helps make this easier to do. Make sure that your index finger is stabilizing the body of the ring forceps (see above).



Perpendicular application of the ring clamp
(Engender Health, 2007)

c. Third, hold the axis of the ring forceps aligned with the axis of the vas deferens, parallel to the vas deferens and directly above it.



Parallel application of the ring clamp
(Engender Health, 2007)

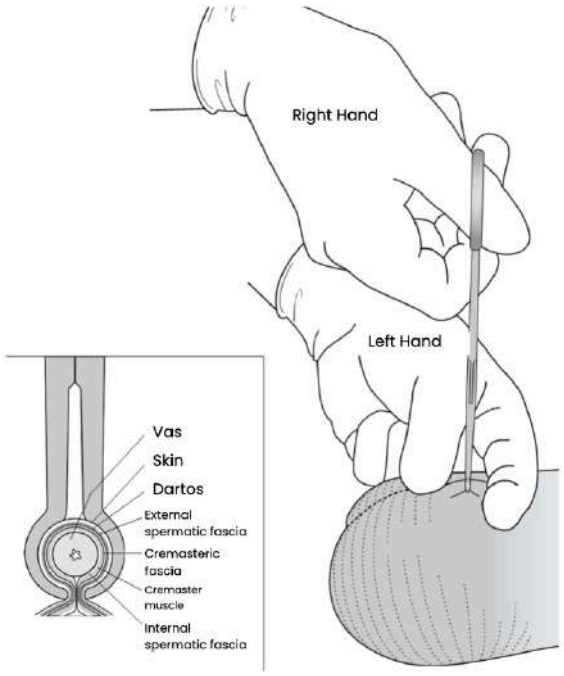
2. If you don't follow the three points above, the clamp may not secure the vas completely, or it may grab too much skin. The ring forceps should surround the entire vas deferens.

7.6.2. Application of the Ring Forceps on the Scrotum and Right Vas

Before applying the ring forceps, palpate the vas using the three-finger technique to determine the optimal location for the grasp. The goal is to position the vas just beneath the median raphe and to grasp the vas beneath the already anesthetized skin. Using the three-finger technique (described above), firmly stretch the skin that covers the vas, focusing on the area that has been anesthetized. The skin should be as thin as possible.

This position allows better access to the straight portion of the vas and facilitates the rest of the procedure. Using the tip of the ring forceps, check that the skin is numb before applying the ring.

1. Open the ring forceps and press the tips onto the skin immediately overlying the canal (see below).
2. Apply upward pressure with your middle finger under the scrotum (to resist the downward push of the ring clamp) and press the duct from below toward the ring.
3. Slowly and gently close the clamp around the vas deferens, until the first click. Administer additional local anesthesia if the patient reports pain.



Application of the ring forceps around the vas deferens
(Engender Health, 2007)

Avoid two potential issues when applying the ring clamp:

1. Be sure to raise your middle finger under the scrotum. Otherwise, the finger will give way under the downward pressure of the ring clamp and you will have difficulty stabilizing the vas.
2. Do not grab too much skin with the ring forceps. Doing so will make it difficult to dissect and remove the vas deferens and may cause slight bleeding. The skin should be stretched over the vas deferens just before applying the ring clamp.

a. If you grab too much skin, stabilize the vas deferens with your left hand, between your thumb and index finger, and then loosen the clamp slightly without releasing it completely.

b. Use the fingers of your left hand to release some of the skin from the grasp of the forceps, while maintaining the grip of the forceps on the vas deferens.

c. Then secure the ring forceps again, only to the first click of the instrument.

Instead of the tight skin technique described above, some surgeons perform the puncture first.

1. If the scrotal skin is thick and the vas is deep in the scrotum, and you cannot grasp the vas from the skin with the ring forceps, you can first puncture the skin with the dissecting forceps.

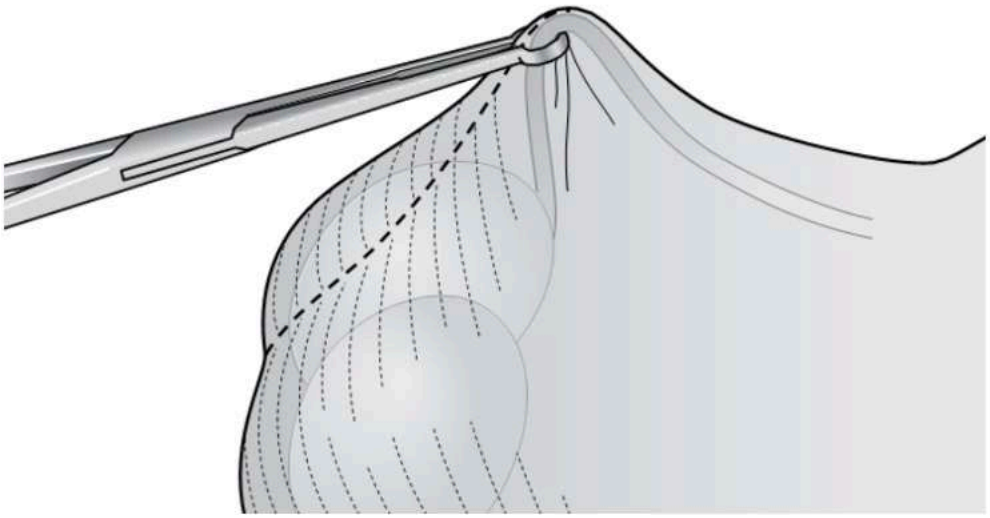
Carefully grasp the vas through this puncture. Do not try to grasp the vas blindly with the ring forceps inside the scrotum if you cannot identify it with the three-finger technique.

Before the next step, make sure to check that the vas is completely within the ring of the forceps.

7.6.3. Elevation of the Underlying Right Vas

While the ring clamp is still grasping the skin of the scrotum and the underlying right duct, lower the handle of the ring clamp. This causes a curvature in the vas (see below).

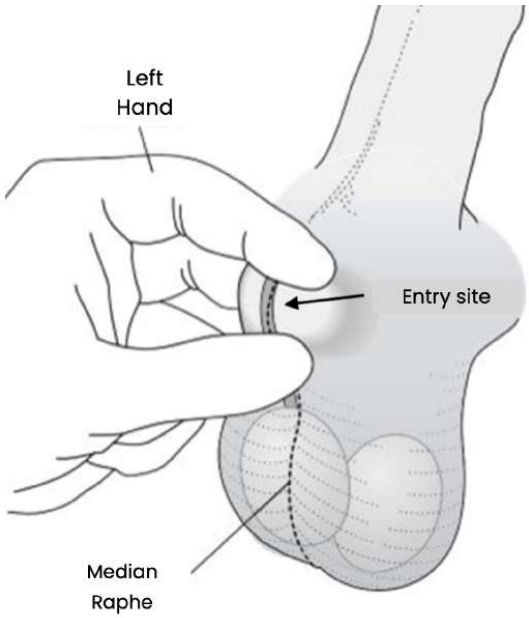
This movement elevates the vas deferens. Continue to keep the axis of the clamp aligned with the longitudinal axis of the vas.



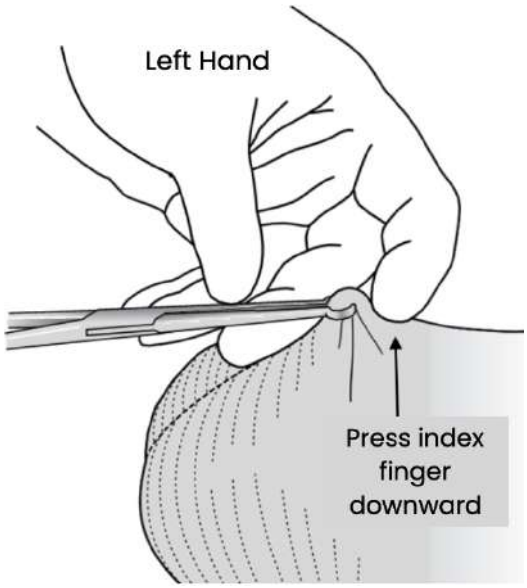
Elevation of the vas held in the ring clamp
(Engender Health, 2007)

7.7. VAS DELIVERY

7.7.1. Scrotal Skin Perforation



Entry site for scrotal piercing
(Engender Health, 2007)



Left index finger pressing slightly down
(Engender Health, 2007)

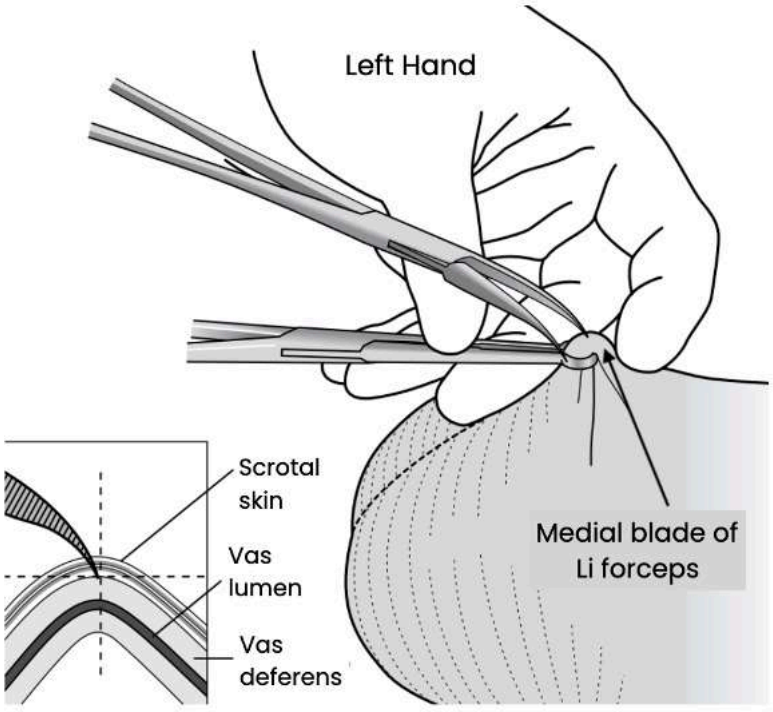
1. The skin must be pierced in the area previously anesthetized, halfway between the top of the testicles and the base of the penis (see below).

   Using your left index finger, press lightly down to tighten the scrotal skin just in front of the tips of the ring clamp and over the anesthetized area.

2. Hold the dissecting forceps (Li forceps) in the right hand, with the tips curved downward, in preparation for perforation of the vas deferens.

a. Hold the instrument so that there is a 45-degree angle between the closed tips of the forceps and the vas.

b. Then open the clamps. Using only the medial blade (blade near your left hand) of the forceps, pierce the scrotal skin just above the upper edge of the ring forceps, where the vas is most prominent. About 1-2 mm before the top of the vasal loop towards you. (see below).

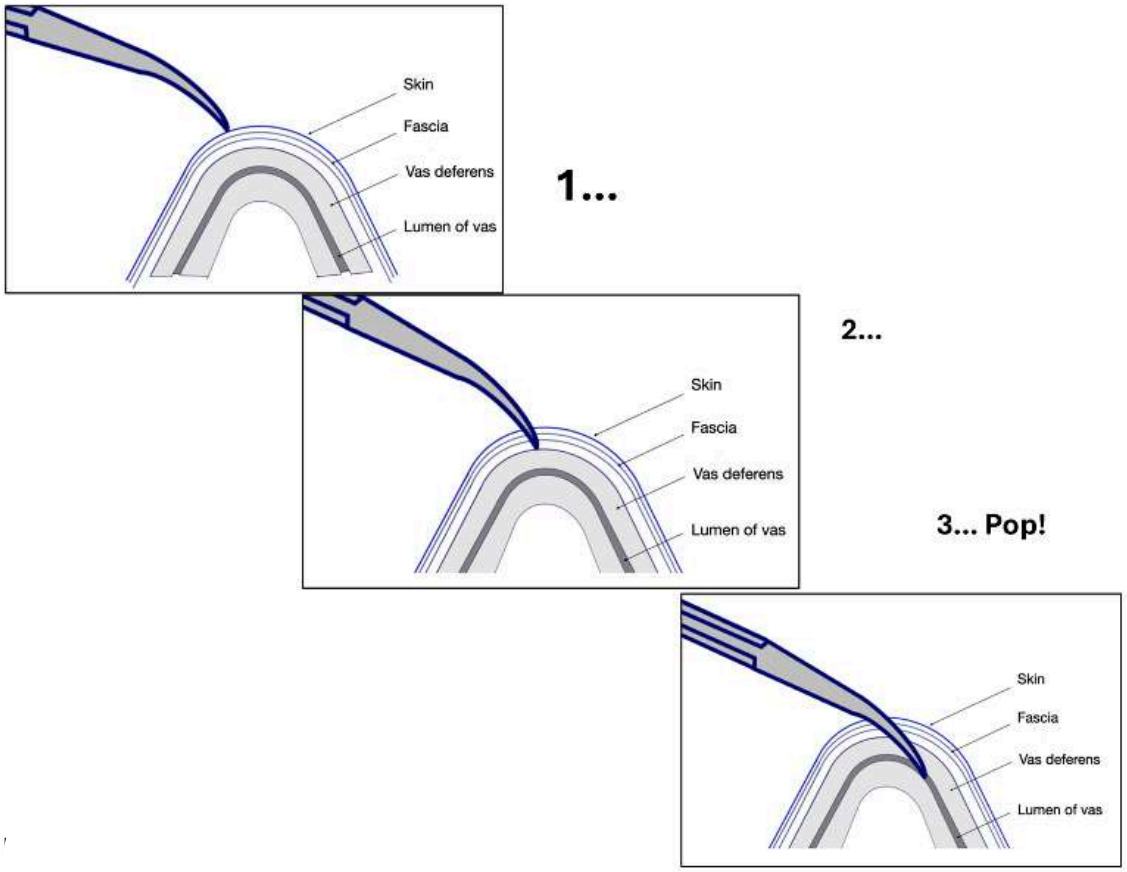


Scrotal piercing with the medial blade of the Li clamp
(Engender Health, 2007)

c. This perforation should result in a midline puncture of the vas deferens.

i. When performing the puncture, think carefully about the proper depth. If the puncture is too superficial, you will not open the fascia and the vas will be more difficult to deliver. If the puncture is too deep, you will transect the vas and the severed ends of the vas will fall down into the scrotum.

ii. Advance the medial tip of the forceps downwards and slightly forwards toward the lumen of the vas. You will feel a “pop” when you have entered the muscular wall of the vas.



(John Curington, 2024)

3. Avoid the following mistakes when piercing the skin of the scrotum:

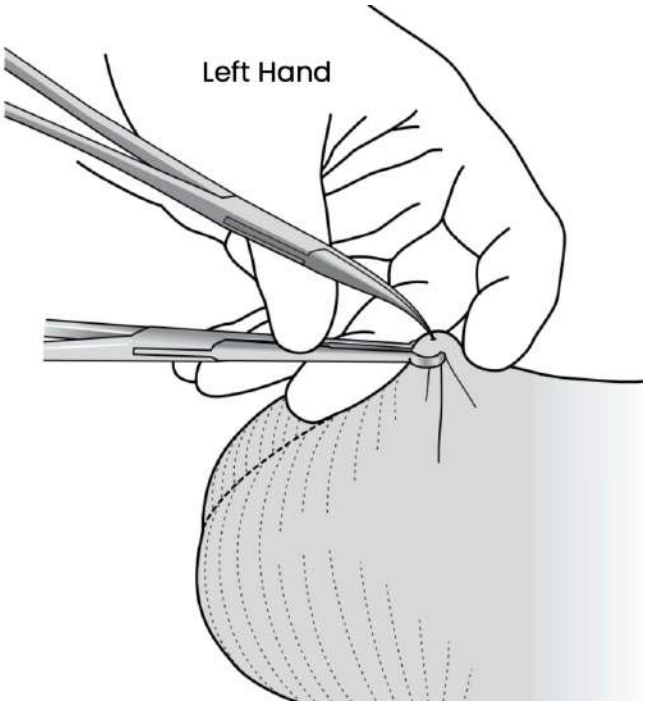
a. As you make your puncture, be sure to continue through the skin and fascia into the the anterior wall of the vas. If you make the puncture too superficial, the intact overlying fascia will prevent elevation of the vas deferens out of the puncture.

b. If the puncture is too deep, unintentional transection of the vas deferens may occur and the artery in the vas deferens may be damaged. It may be difficult to find the vas again and the bleeding may be difficult to control.

c. Be sure to perform the puncture near the apex of the arc of vas, about 1 to 2mm just before this apex. If the puncture is performed too close to you, i.e. in the tissue that is grasped with the ring forceps, you will not be able to spread the tissues properly. If the puncture is performed too far from you, you will risk skimming the vas without opening the fascia.

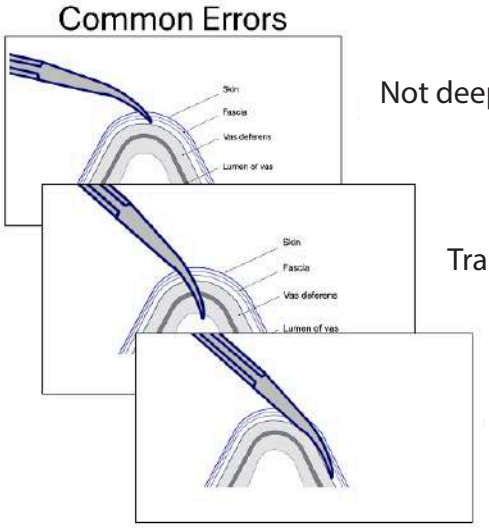
4. After performing the puncture, remove the medial blade of the dissecting forceps. Close the tips of the instrument.

5. At the same 45-degree angle as before, insert both tips of the forceps in the same puncture hole, on the same line and at the same depth as when performing the puncture with the single blade.



Insertion of both tips of the Li forceps
(Engender Health, 2007)

6. The ring clamp remains in place and locked while the skin is pierced.



Not deep enough

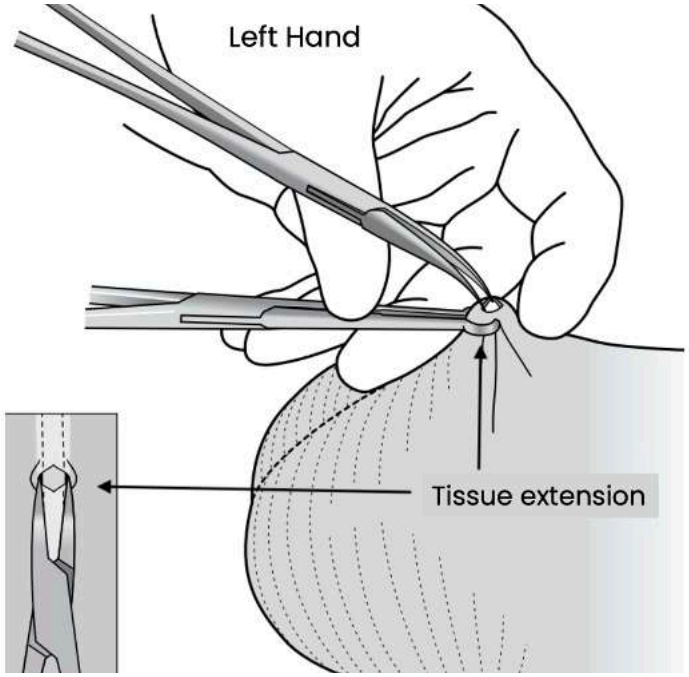
Transecting the vas.

Skimming the vas.

(John Curington,2025)

7.8. Spreading of the tissues

Insert both tips of the closed Li dissector into the skin opening and slightly into anterior wall of the vas. Gently open the tips of the dissecting forceps transversely along the vas to create an opening in the skin and fascia that is twice the diameter of the vas (see below).



Extension of the tissues with both tips of the Li forceps
(Engender Health, 2007)

In one motion, spread all layers of tissue from the skin to the vas deferens. The tips of the forceps should penetrate deep enough to expose the bare wall of the vas. To make sure the blades are well in the anterior wall of the vas before spreading the tissue, open the blades 1 mm to feel that the point of the forceps is in the vas.

Otherwise, the blades will pop out when you stretch. No harm occurs if the blades enters the lumen.

Take care to keep the closed blades of the dissecting forceps parallel to the vas deferens and follow the curve of the vas with the curve of the dissecting forceps. Never go backward once you start stretching the fascia. Apply a gentle downward movement of the forceps tips at the end of the stretch to clear the tissue and reveal the vas.

You should now see the bared vas. The skin and duct sheath will remain open after the tissues are extended. In contrast, the opening of the vas deferens will close after extending. As it closes, the puncture site in the vas deferens may appear as a longitudinal groove. The stretched opening in the skin and sheath, which should be twice the diameter of the vas, will allow you to lift a handle of the vas.

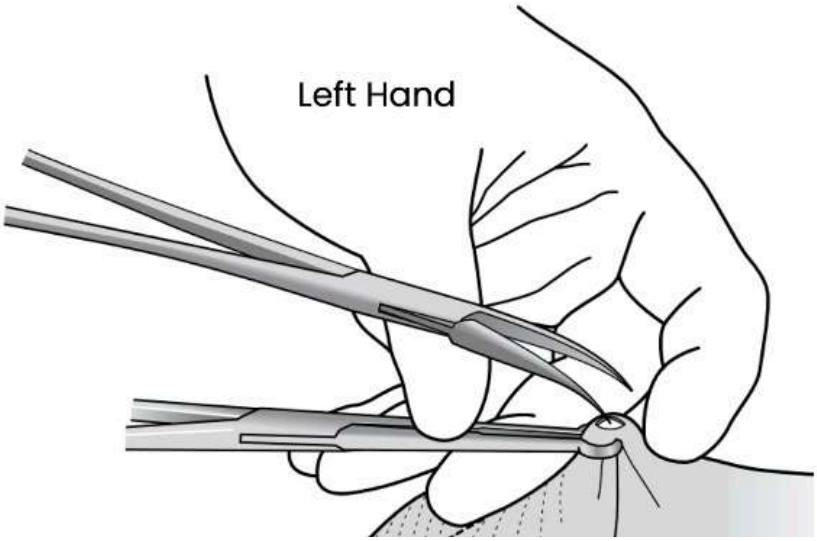
The ring clamp remains in place and locked while the tissues are extended.
If the vas is not totally bare (i.e. fascia slides over the vas if you touch it with the dissecting forceps) and the opening is too small after stretching the fascia, you have 2 options:

i. Puncture down to vas again with one tip of the dissecting forceps, close the forceps, insert both tips into the puncture, gradually dissect the sheath moving the tips forward 2-3 mm under the sheath while making small opening/closing movements. Finally stretch the sheath downward to expose the bared vas.

ii. Put the tip of the blade under the vas and rotate (supinate) your wrist until your palm is fully up and the tip of the dissecting forceps is holding the vas well. Remove the ring forceps and re-encircle the vas with the ring forceps.

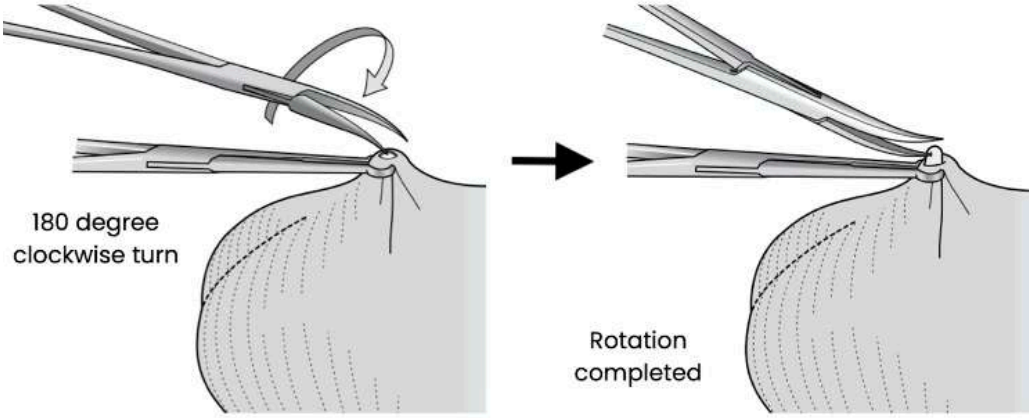
7.9. Extraction of the Vas

Remove the dissecting forceps from the puncture hole. With the tip of the lateral blade (blade away from left hand) of the dissecting forceps facing down, pierce the wall of the vas deferens at a 45 degree angle. Using the lateral blade allows the operator to rotate the wrist more easily.



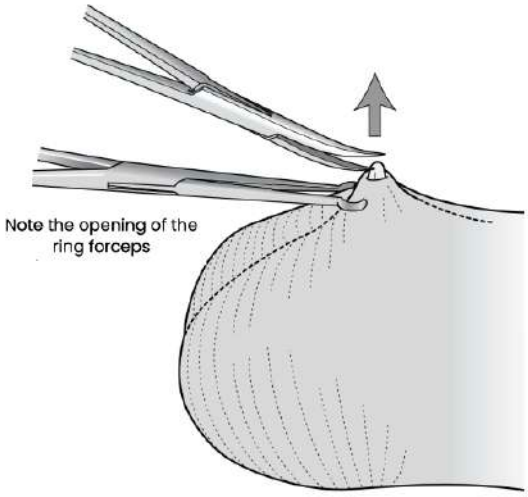
Puncturing vas deferens with lateral blade of Li forceps

With the lateral blade inserted into the vas deferens (in the small groove) and the ring forceps still holding the scrotal skin, rotate the handle of the dissecting forceps clockwise 180 degrees so that the tips move upward, to form a loop of the vas deferens.



Rotation of the Li Dissecting Forceps
(Engender Health, 2007)

While rotating the dissecting forceps with your right hand, slowly release the ring forceps with your left hand, allowing the Li forceps to elevate the vas through the skin puncture. Do not pull up the vas. You may tear it. If the vas is totally bare, it will easily slide out of the scrotum once the ring forceps is removed.



Simultaneous release of the ring forceps during the
rotation and elevation of the Li forceps
(Engender Health, 2007)

This simultaneous rotation with one hand and release of the ring clamp with the other requires practice and coordination. At the beginning of the rotation, your right hand will be palm down. After the hand rotation, it will be with the palm facing up. If the vas deferens is difficult to remove, the sheath may need to be opened further.

Pay attention to these possible errors:

1. Do not attempt to remove the vas deferens while the ring clamp is still locked. If you do, the vas deferens may be cut.
2. If fascial tissue is trapped between the tips of the Li forceps, you will not be able to rotate or elevate the vas deferens. Keep the tips of dissecting forceps up, remove the ring forceps, re-encircle the vas with the ring forceps and open the fascia again.

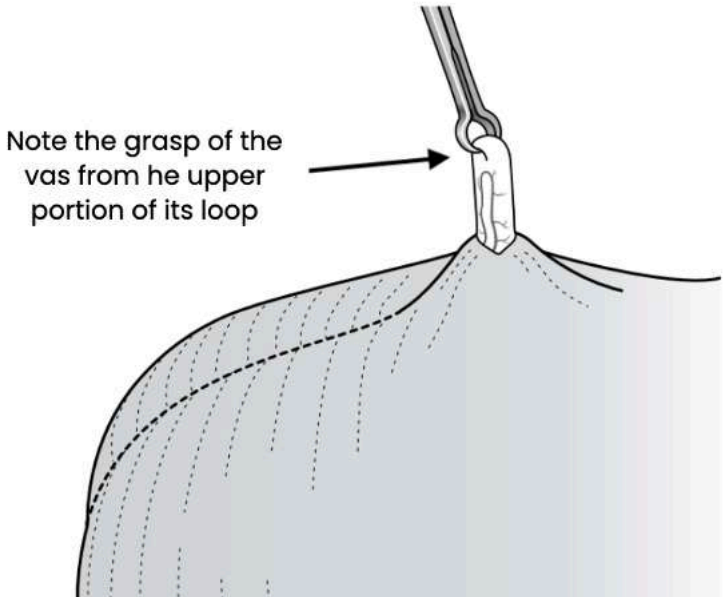
7.10. Grasping the Vas Deferens with the Ring Forceps

Once a loop of the vas deferens has been secured and extracted, gently close the Li forceps on the vas deferens to prevent it from sliding back toward the scrotum while removing the ring clamp from the skin.

Do not worry if you notice ecchymosis on the vas when it is delivered or even a tiny hematoma – it is most likely from the local anesthetic injection.

Then grasp the loop of the vas by biting it through a partial thickness of its wall with the ring forceps. Sometimes you will see a groove in the vas, created when it was punctured, and tissues were spread. Do not circle the vas in the ring. Grasp it!

Important note: Make sure you grasp only the bare vas avoiding grasping any fascia with the ring forceps. This is the KEY to easy performance of fascial interposition for occluding the vas.



Grasping the vas deferens loop
(Engender Health, 2007)

After a partial thickness of the vas has been grasped, release the Li dissecting forceps.
Be aware of the following potential hazards when grasping the vas with the ring clamp:

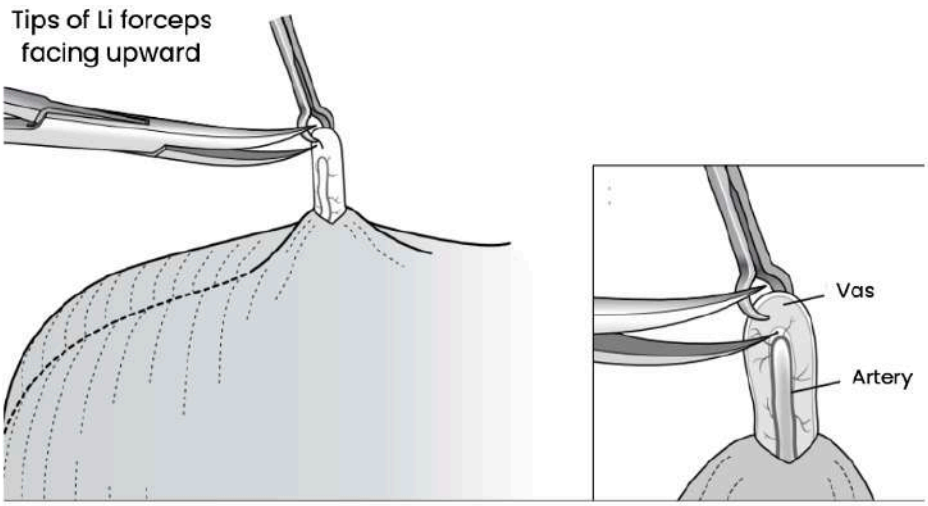
1. Hold the vas carefully with the Li dissecting forceps until you have a secure grasp of the vas with the ring forceps. This will prevent the vas deferens from slipping back into the scrotum.

2. To avoid damaging an artery on the vas and causing bleeding, be sure to grasp the vas by at the apex of the loop on a “clean” section of vas. Grasping elsewhere can lead to bleeding.

3. Do not completely encircle the vas with the ring forceps. Make sure you have a good grasp of the vas by slightly "piercing" the vas with the ring forceps at the apex of the loop. If the ring clamp is placed around the entire circumference of the vas deferens, the vas may slip through the ring and then fall back into the scrotum when it is divided.

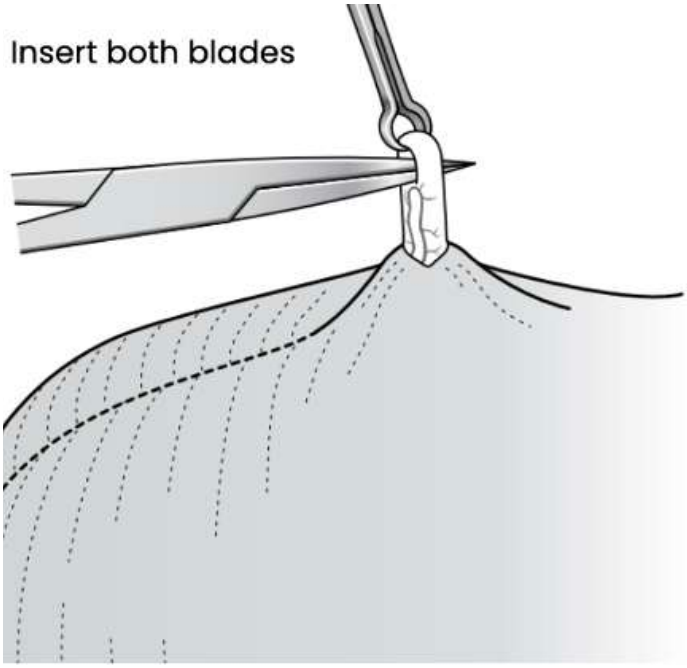
7.11. Separation of the Fascia and Vasculature of the Vas

Using one tip of the dissecting forceps (tips facing up), gently pierce the vas sheath just below the loop, taking care not to damage the artery (see below). Push the tip gently through the sheath halfway the length of the blade. You will have created a small window over the posterior aspect of the loop of the vas. Then remove the tip.



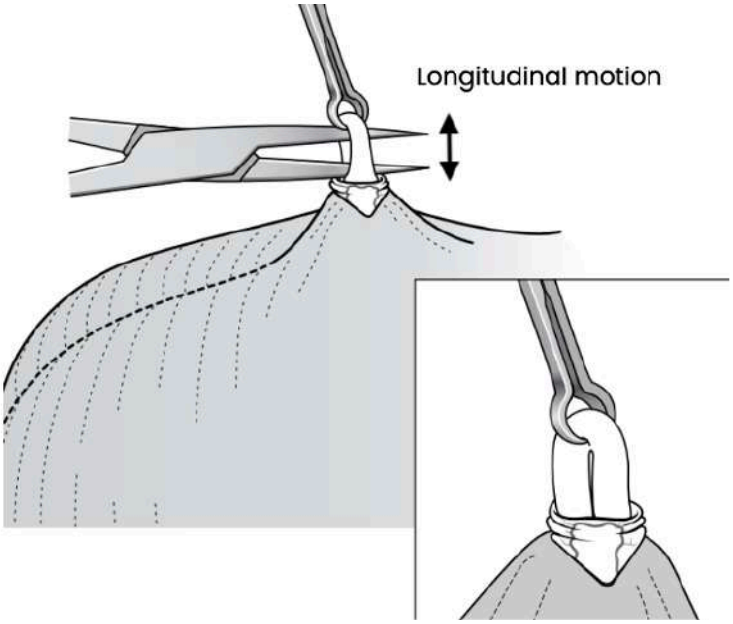
Separation of fascia and vas vasculature
(Engender Health, 2007)

Close the tips of the dissecting forceps. Now, insert both tips into the perforated sheath.



Separation of fascia and vas vasculature
(Engender Health, 2007)

Carefully open the dissecting forceps (see below). Peel the sheath and surrounding tissues downward, for less than 1 cm in length of the vas. This is a longitudinal movement, not a transverse one. You need just enough length of bare vas (3-5 mm) to hemi-transect it with the scissors. Pushing the fascia further down makes the abdominal segment disappear further down into the sheath when divided and makes fascial interposition more difficult.



Separation of fascia and vas vasculature
(Engender Health, 2007)

Be careful to avoid blood vessels. Clamp or cauterize any bleeding immediately. When checking for bleeding, pay special attention to the abdominal segment of the vas deferens, which is where bleeding from the vas deferens artery could occur (a common reason for hematoma formation).

At this point, we would usually continue on to occluding the vas. For this teaching discussion, we will review the delivery of the left vas before continuing on to occlusion.

7.12. Isolation and Delivery of the Left Vas

Adjust your left hand to grasp the left vas deferens, using the three-finger technique.

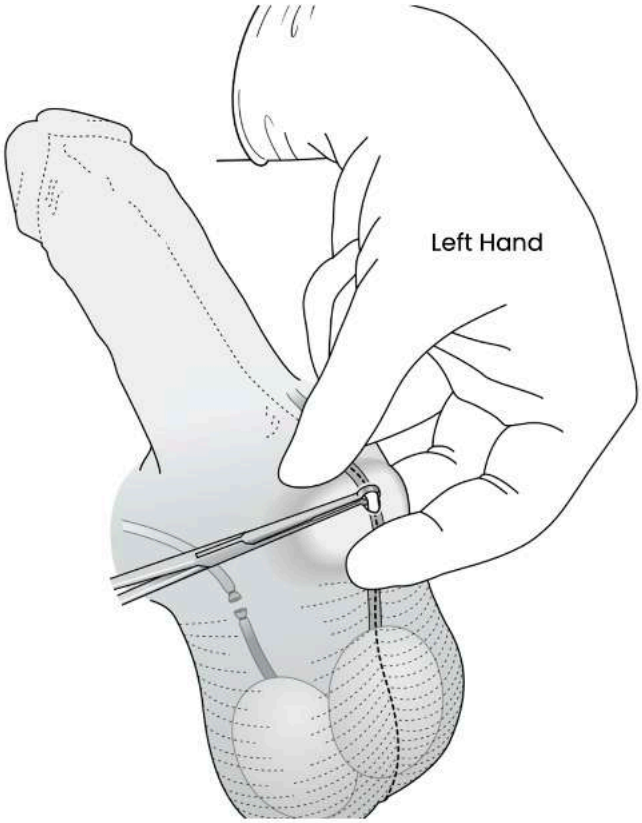
As described above, place your middle finger under the scrotum, with your thumb and index finger above the scrotum. Place the vas directly below the previously opened puncture site.

This position may be uncomfortable at first, but with practice the skilled operator will be able to isolate the left vas as gently as the right. Holding the vas with the left hand frees the right hand to manipulate the instruments (vice versa for the left-handed operator).

7.12.1. Application of the Ring Clamp for the Left Vas

While maintaining the puncture site over the vas deferens, use the three finger technique to stretch the skin so that it is as thin as possible. Open the ring clamp and press the tips downward, one tip on each side of the puncture.

To expose the vas deferens through the puncture site. Lock the clamp around the vas and overlying sheath. As with the right vas deferens, and as explained previously, use the “palm up” approach to ensure that the instrument is applied perpendicular to the vas deferens (90 degrees).



Exposure of the left vas deferens
(Engender Health, 2007)

Occasionally, the sheath and underlying canal cannot be clamped due to local edema. Insertion of the clamp into the scrotal tissue (without including the skin) is an option. However, if the vas deferens is directly below the puncture hole, inserting the forceps into the scrotal tissue will likely not contribute to trauma or infection.

If the operator searches for the vas deferens blindly, with the ring clamp inside the scrotum, the risk of trauma and infection is likely to increase.

Grasping the left vas deferens and its sheath directly with the ring clamp through the puncture hole can make the vasectomy easier to perform, particularly when the scrotal skin is thick.

7.12.2. Extraction, Elevation and Eissection of the Left Vas

Follow the steps previously described for the right vas deferens.

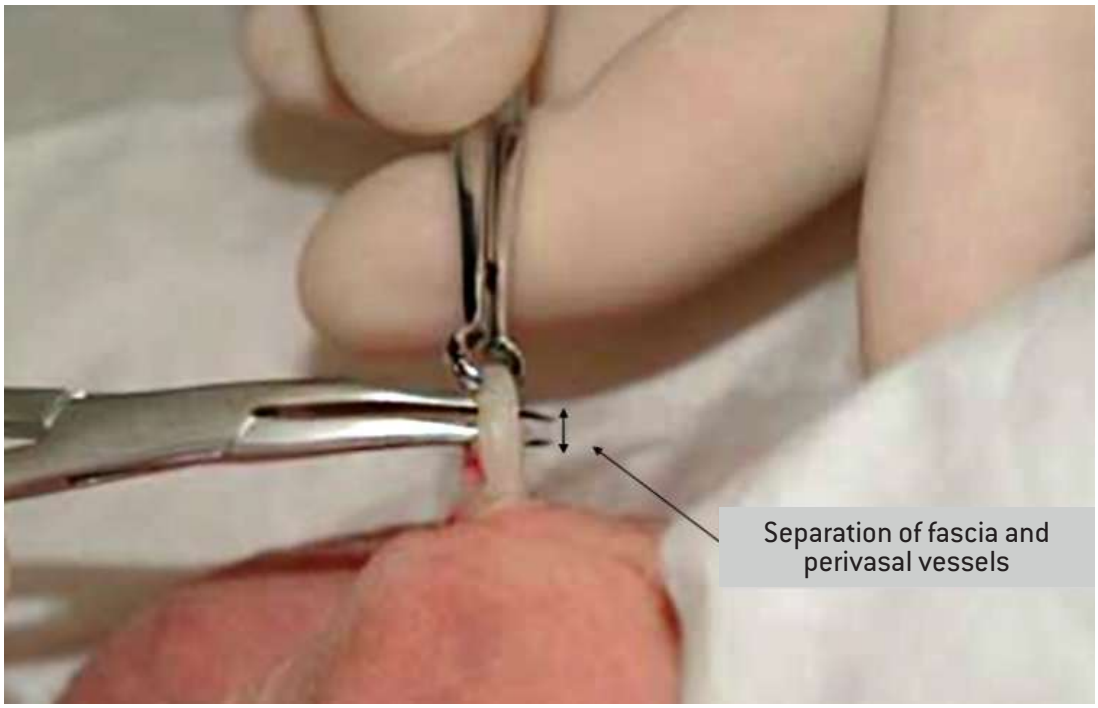
Note: The no-scalpel vasectomy can also be initiated on the left side, with the right side performed as the second side. It is a matter of surgeon preference. Whatever the initial side adopted to start the procedure, the surgeon should always stick to the same choice to avoid "forgetting" one side or performing the procedure twice on the same side.

7.13. Vas Deferens Occlusion Technique

Below are the steps for occlusion of the vas deferens using mucosal cauterization of the prostatic (abdominal) end of the vas deferens, and the interposition of the perivasal fascia. These are performed in the same way for both vasa deferentia.
Remember that occlusion of the vas deferens is more easily performed in the straight portion than in the convoluted portion of the vas.

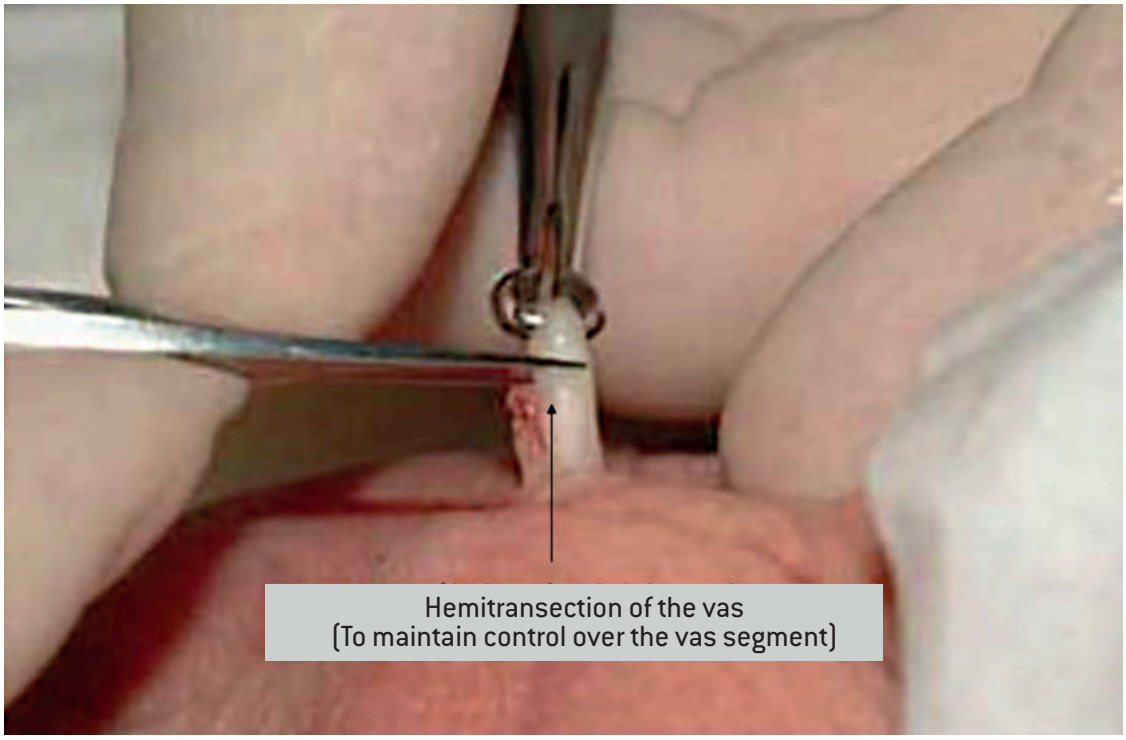
7.13.1. Thermal Cautery of the Vas Mucosa

1. The vas is now exposed outside the scrotum. The exposed segment should be completely separated from the sheath as described above and illustrated in the figure below.

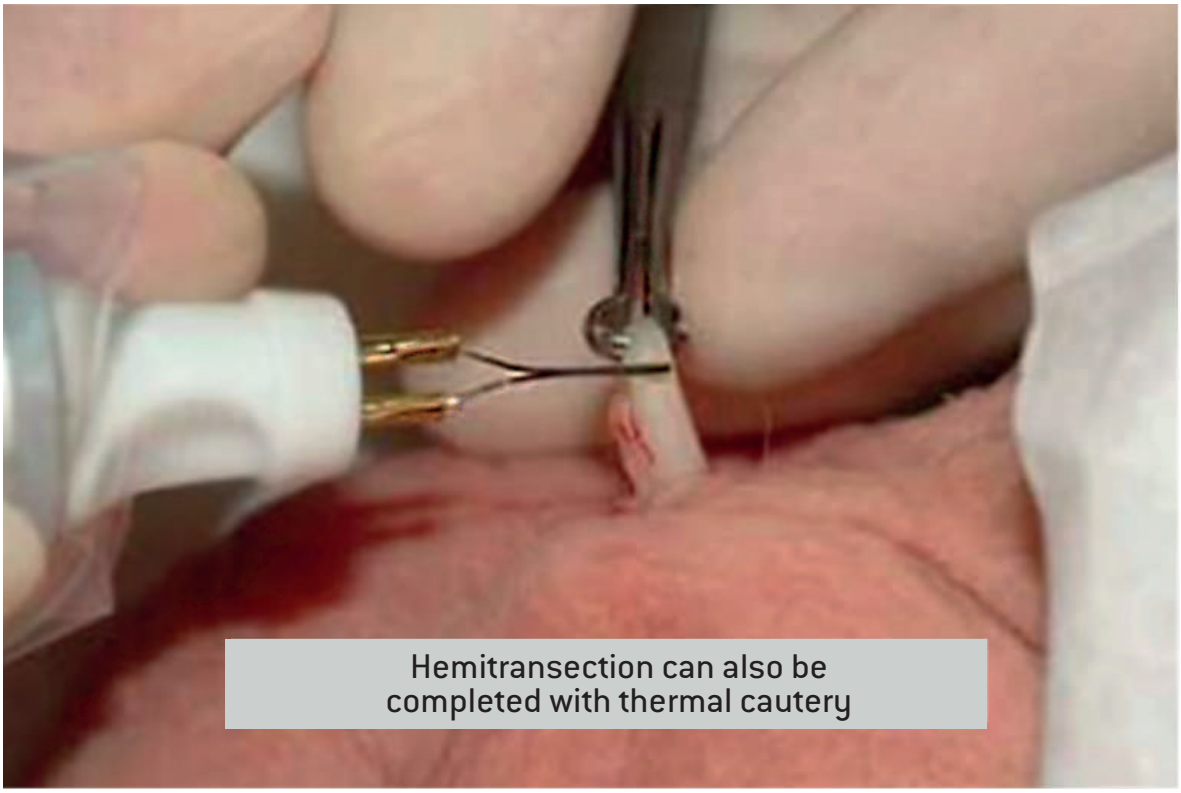


Open the Li forceps to separate the sheath
(Labrecque, 2011))

a. Perform a hemi-transection of the prostatic end of the bare vas, midway between the teeth of the ring clamp and the remaining vas sheath. About 2-3 mm above where you see the fascia. This can be done with the iris scissors or by activating the thermal cautery.
b. The cut should be deep enough to expose the lumen of the vas, but the posterior wall of the canal should remain intact.



Hemi-transection of the vas deferens with scissors
(Labrecque, 2011)



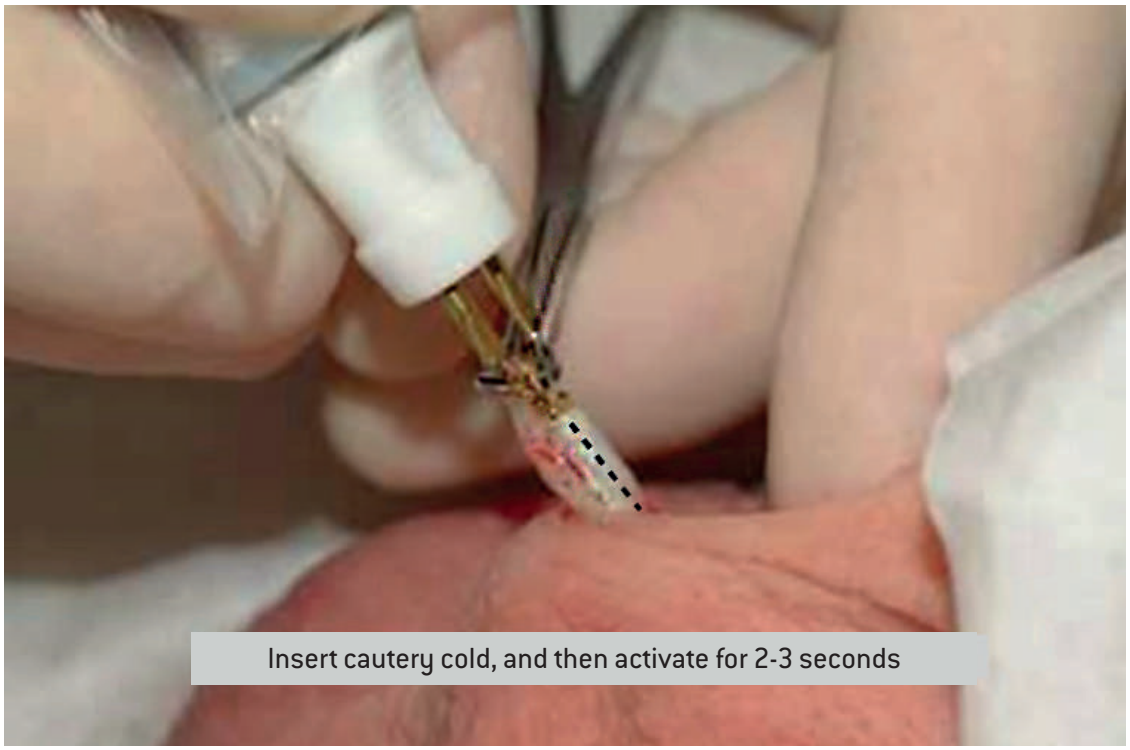
Hemi-transection of the vas deferens with thermal cautery device
(Labrecque, 2011)

c. Should you accidentally transect the vas, attempt to re-secure the abdominal segment. Grasp the stump of the abdominal segment with the Li or hemostatic forceps. Apply gentle traction on the abdominal segment exposing approximately 1 cm, perform hemi-transection in this 1 cm segment and proceed as usual except for excising the segment between the two transections.

2. Insert the tip of the cold cautery into the lumen of the vas in its prostatic direction. Then, place it parallel to the canal while fully inserting the tip into the lumen.

a. Verify that the device is working properly before starting the procedure. The tip should turn red when the device is turned on.
b. Do not insert the tip into the lumen when the device is turned on. The tip should be cool when inserted.
c. Holding the cautery pen like a pencil with your dominant hand and supporting the vas against your index finger of the other end to open the cut (if made with scissors), advance the tip of the cautery pen into the lumen until it can advance no further i.e. where the cautery tip widens.
d. Placing the thumb of your non-dominant hand on the cautery pen to stabilize it helps to direct the tip into the vas lumen.
e. Make sure the tip is inside and parallel to the lumen before turning on the device.

3. Turn on the cautery device for 2 to 3 seconds, until the vas begins to become opaque or vapors appear.



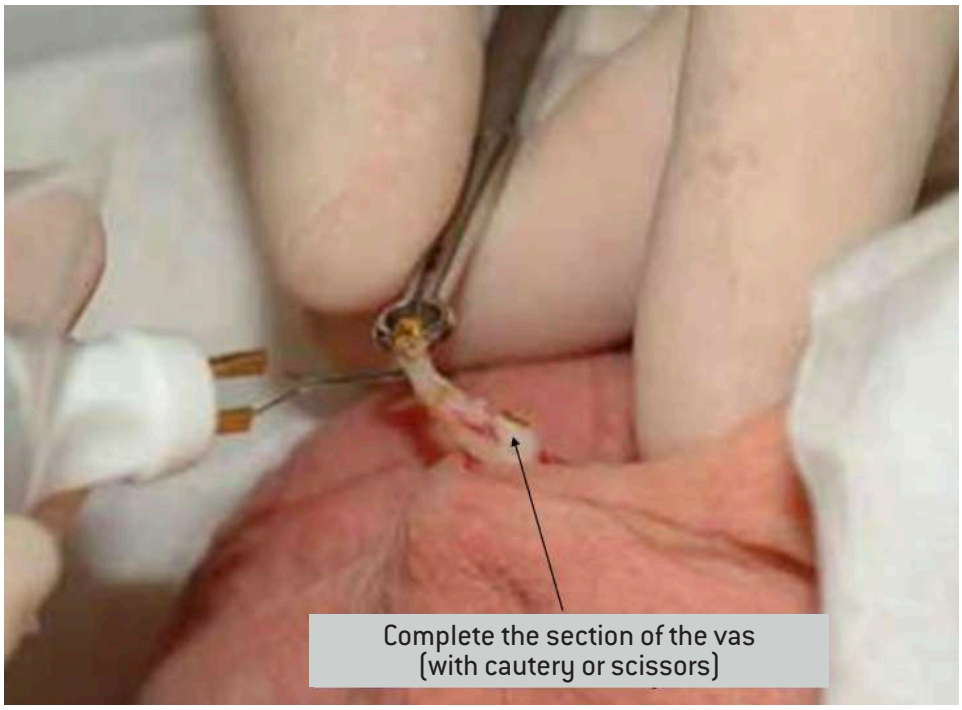
Cauterization of the epithelium, inside the lumen of the prostatic segment of the vas (Labrecque, 2011)

a. Be careful not to burn the vas deferens too much. Only the mucosa should be destroyed, not the muscular wall of the vas.
b. The time of cauterization varies depending on the power of the battery. Cauterization with fresh alkaline batteries may take only 1 second.
c. If the tip is stuck in the vas deferens, gentle traction on the cautery with a twisting motion can be used. It may help to turn the device on for another second while you take it out.

7.13.2. Fascial Interposition over the Abdominal (Prostatic) Vas Stump

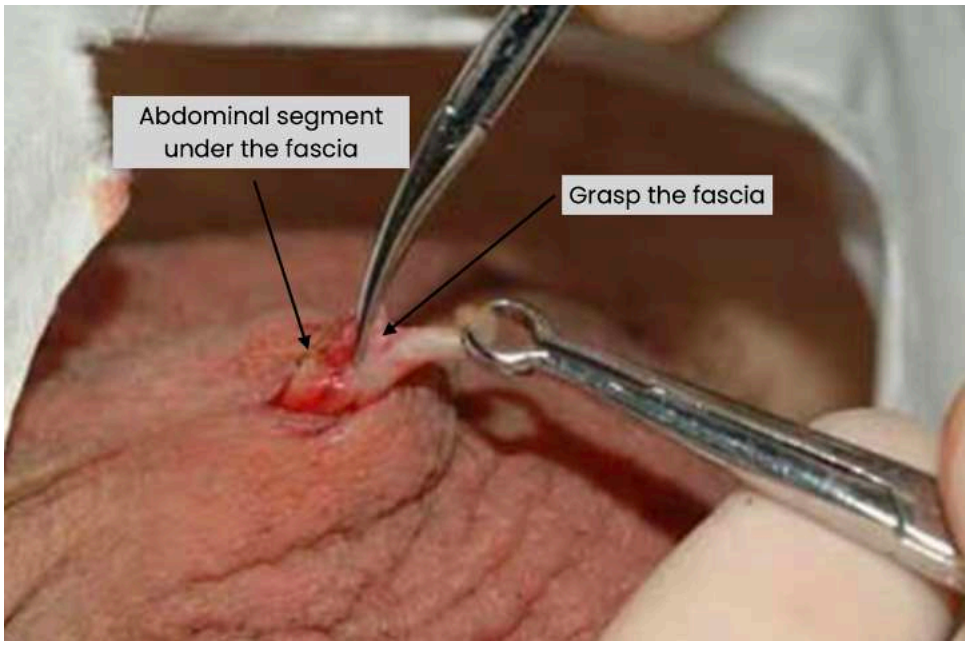
1. Completely transect the vas using the iris scissors or activated cautery device.

   a. Complete the cut exactly at the site that was hemi-transected. The abdominal segment of the vas should slide into its sheath beneath the fascia.
   b. Do not apply traction on the ring clamp (the testicular stump) while cutting the duct. Traction can cause the prostate stump to slide too deeply into the scrotum.
   c. However, if the abdominal segment of the vas does not slide into its sheath, "clean" it of fascia with cautery or scissors and it will.



Cutting the vas with the thermal cautery device
(Labrecque, 2011)

2. To cover the prostate stump, use hemostatic forceps (mosquito) or dissecting forceps (Li forceps) to grasp the full thickness of the sheath midway between the place where the fascia attaches to the segment of the testicular duct and the prostatic stump.



Grasp the internal spermatic fascia with dissecting forceps (Labrecque, 2011)

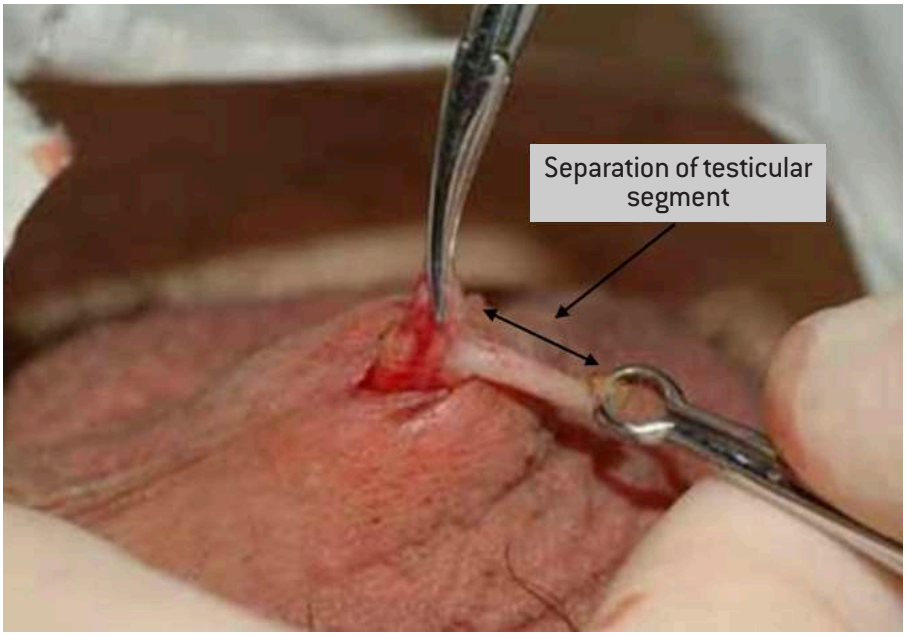
d. If the prostate stump does not slide spontaneously into its sheath, do one of the following until the vas deferens slides into its sheath:
   i. Ensure that the posterior wall of the vas deferens (including its sheath) has been completely transected by very gently making an additional cut with the cautery device. After a proper transection, a loop will no longer be observed.
   ii. Gently use the hemostat to push the prostate stump into its sheath.
   iii. Pinch the fascia over the stump with your thumb and index finger.

3. When grasping the fascia with the forceps, be sure to grasp both sides of the sheath to cover the prostatic segment. Slide the forceps snugly against the testicular vas segment so that you grasp the sheath from the back wall of the testicular vas segment.

e. Gripping the fascia too high or too low prevents complete and adequate coverage of the stump.

f. NEVER release your grasp on the fascia once you have it. The prostatic segment will slide deeply into the scrotum and fascial interposition will be more difficult to perform. If you need to reposition your grasp on the fascia, PINCH and hold the fascia with the fingers of your non-dominant hand (allowing the ring forceps holding the testicular end to rest in the sterile field) and re-grasp the vas sheath. Pinching is important to prevent the abdominal segment from sliding too deep, making fascial inter-position more difficult.

4. Holding the fascia firmly with the Li dissecting forceps or mosquito forceps, gently tear back the testicular end to separate at least 2-3 mm of the fascia covering the testicular segment. This is essential in order to create sufficient fascial tissue to suture (see next step below). 'Clean' around the testicular segment gently with thermal cautery if you can't tear back initially and proceed to tearing back again.



Pull the testicular stump to separate the sheath that covers the testicular stump (Labrecque, 2011)

5. Place a free tie of 2-0 or 3-0 Vicryl or Prolene suture (or other absorbable suture material) with at least 3 knots on the fascia overlying the prostatic stump. Silk may also be used if only available suture material.

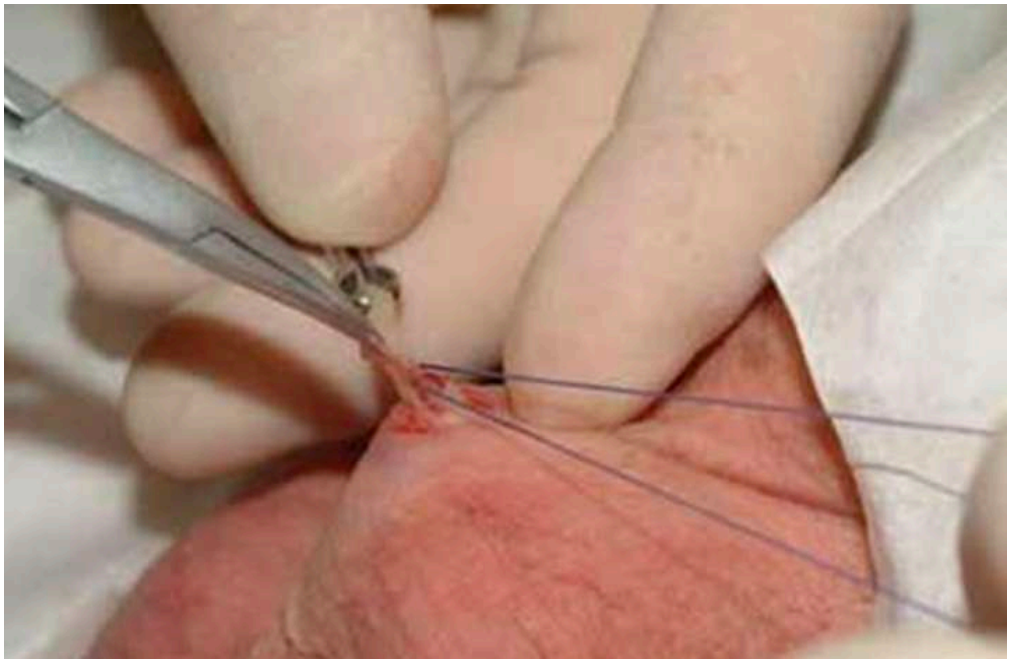
a. Ease the tie under the haemostatic forceps with fingers so that it includes all the sheat. No fascia should remain "free" on the testicular segment.

b. The knot should sit close to both the clean testicular segment and the abdominal stump. There should be NO GAP between where the tie is against the testicular segment and the covered abdominal stump.

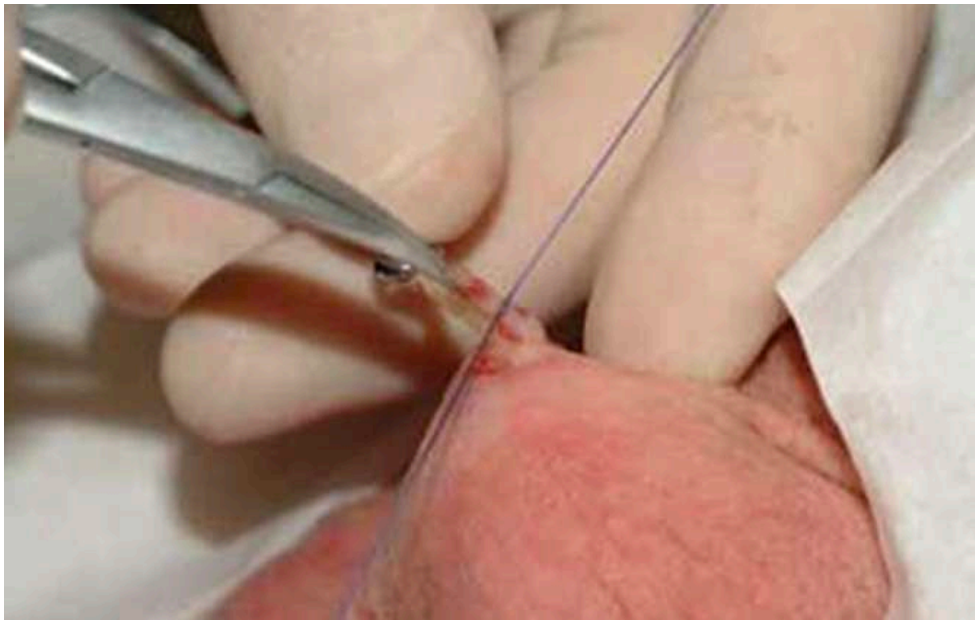
c. Fascial ligation can help to fully push the prostate stump into the fascia if this was not adequately achieved in Step 7.

d. Vessels can be ligated concomitantly to control bleeding.

e. Be sure to ligate only the fascia and not the abdominal stump unless the abdominal vas segment does not slide into its sheath after performing all preceding steps. In this case, it is acceptable to include the abdominal stump in the knot.



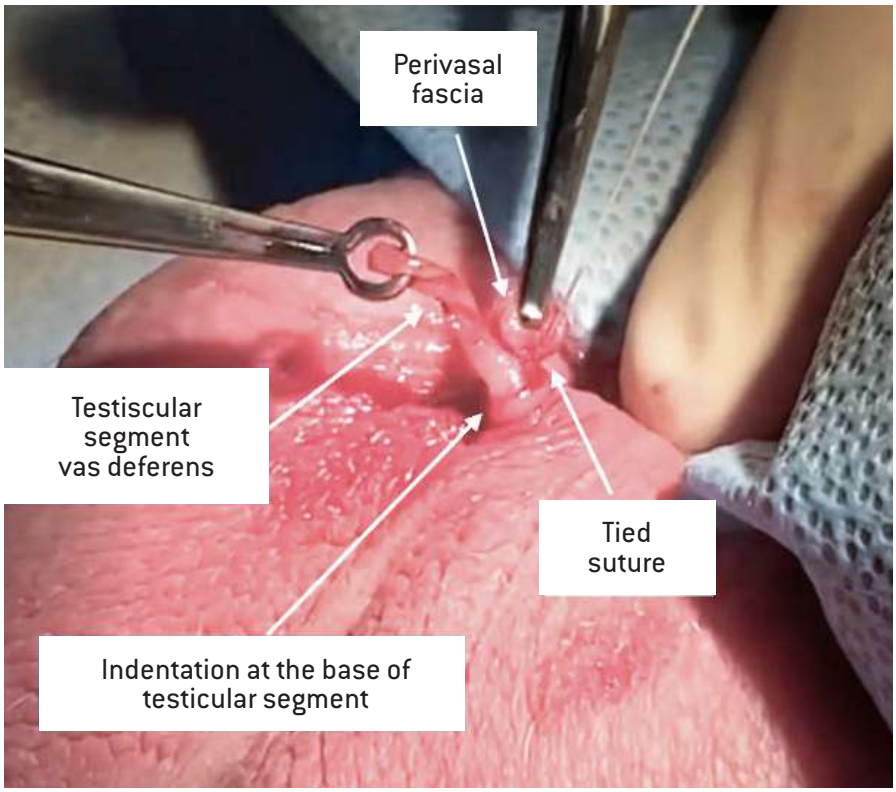
Ligate the fascia on the prostatic stump
(Labrecque, 2011)



Ligate the fascia on the prostatic stump
(Labrecque, 2011)

When optimal fascial interposition is performed, the abdominal (prostatic) segment of the vas deferens will be completely covered by fascia. Again, make sure that the testicular segment is clean - NO fascia/vessel on the back or the side. If there is, clean again, and include these tissues in the tie around the sheath bundle.

The tension generated by the suture applied to the fascia should create a small indentation (notch or collar) around the base of the exposed testicular segment of the vas deferens (see below). This indentation on the bare testicular segment indicates that all the vas sheath is included in the tie. This is the best sign that there will be no bleeding/hematoma and that the testicular segment will not slide through the "collar," putting the testicular and prostatic ends in close proximity.



Indentation of the base of the testicular segment
(Guarín, 2020)

5. Cut the Sutures

Remember that the testicular end will be left open. This is referred to as “Open ended vasectomy”. The hypothetical objectives of this technique are:

i. Prevent or reduce post-vasectomy pain by reducing backward pressure caused by sperm production on the epididymis
ii. Allowing a sperm granuloma to form at the severed testicular end of the vas deferens, which some experts speculate could increase the chance of success of potential future vasectomy reversal.

iii. When an open vasectomy is performed, fascial interposition (FI) is critical at the prostatic (abdominal) end of the transected vas to prevent recanalization.

7.13.3. Completion of the Procedure

1. Before letting the stumps of the prostatic and testicular vas slide into the scrotum:

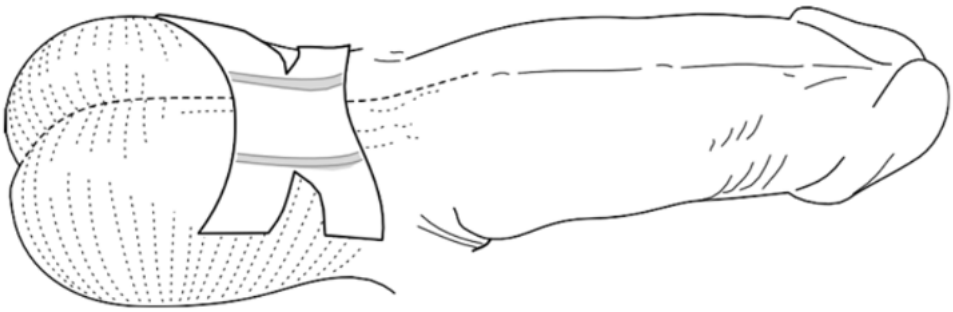
a. Carefully tug on the tie to check it is secure. This will also confirm the side completed as pulling on the tie will bring the ipsilateral testicle up.
b. Check for bleeding.
c. Dunk the vas into the scrotum to ease the tension on the surgical site while keeping the grasp on the testicular end with the ring forceps. There should not be any bleeding.
d. An extra suture snugly applied over the fascia at the base of the testicular segment can control persistent bleeding.

2. Repeat the procedure in the contralateral vas deferens.

3. Bandage the wound.

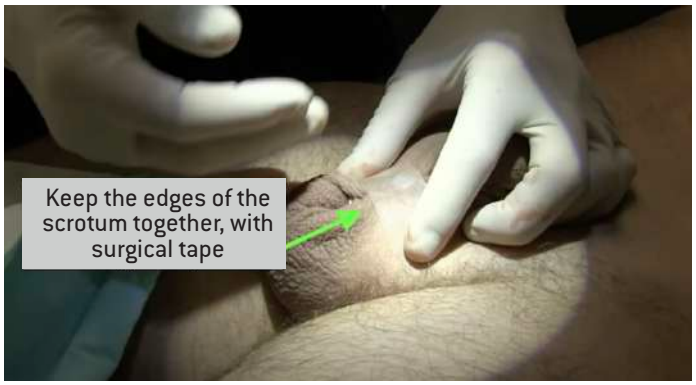
a. After both vasa have been occluded and returned to the scrotum, pinch the puncture site tightly for around 30 to 60 seconds, or have the client hold a gauze and apply pressure himself. Inspect for bleeding.

b. Sutures are not necessary on the skin. A sterile gauze bandage can be held in place with a scrotal support or tape such, or a band-aid can be used to cover the small wound.



Applying a bandage to the surgical wound
(Engender Health, 2007)

c. If superficial bleeding occurs, hemostasis must be achieved. A compressive bandage as described in the next module on intraoperative complications and illustrated in the following picture can also be applied. This compressive bandage can also be applied routinely to prevent bleeding.



7.14. Histological Evaluation

Remember that segments of the vas deferens are not routinely removed in the technique described here. If any part of the vas deferens is removed, histological examination is not routinely required. The American Urological Association has recommended in multiple occasions that histological confirmation of the vas deferens is not needed as a measure of vasectomy success, since post-vasectomy semen sampling (PVSA for its acronym in English) is the determinant of the success of the procedure. Rarely, the surgeon may choose to send excised tissues for histological evaluation and confirm the vasal tissue.

7.15. Patient Communication During the Procedure

Effective communication during the procedure helps build patient trust and reduces anxiety:

- Explain Major Steps: Keep the patient informed about what to expect at every stage of the procedure.
- Monitor Comfort: Continuously check for discomfort or pain and adjust anesthesia as needed.
- Provide Reassurance: Address any concerns and maintain a calm, professional demeanor.

8. Identification and Management of Intraoperative Vasectomy Complications

General Objective

To equip participants with the knowledge and skills to identify, prevent, and manage potential intraoperative complications of vasectomy to ensure patient safety and satisfaction.

Specific Objectives:

By the end of this module, participants will be able to:

1. Identify common intraoperative complications associated with vasectomy.
2. Describe preventive measures to minimize the risk of these complications.
3. Recognize warning signs and symptoms of these complications.
4. Implement appropriate management strategies for intraoperative complications.

8.1. Common Intraoperative Vasectomy Complications

8.1.1. Syncope

Definition

Clinical syndrome in which a transient loss of consciousness occurs, caused by a period of inadequate cerebral blood flow and oxygenation, most often as a result of an abrupt drop in systemic blood pressure.

- Syncope: Temporary and self-limited loss of consciousness.
- Pre-syncope: Clinical manifestations suggesting impending syncope.

Recognition

High preoperative anxiety and noxious stimuli, such as the sight of blood, the smell of cauterization, or the mere thought of a vasectomy, can trigger an episode.
In some cases, it is perceived as a sudden panic attack, due to the subsequent adrenergic discharge.
The patient may feel weak and nauseous. It may appear diaphoretic, pale and cold in its prodromal phase. You may even faint briefly, with spontaneous recovery of consciousness.

Management

Prevention:

- Talk to the patient before the procedure about their fears to reduce their anxiety.
- Set appropriate expectations before starting the procedure.
- Avoid discussing unnecessary surgical details with anxious patients, as this may accelerate their stress response. Limit yourself to providing the minimum information required during the procedure.
- Maintain an ongoing conversation with the patient about topics unrelated to the procedure.
- Avoid sudden motions (e.g. when examining the scrotum, tying the suture, etc.)
- Identify prodromal symptoms early.
- Be sure to use techniques sensory distraction when performing sudden procedures that may overstimulate the patient (for example, applying light pressure to the skin of the scrotum with the fingers just before inserting the anesthetic needle).
- Reduce external noise.
- Have soft music, or music to the patient's taste.
- Involve the partner in the conversation, if they are present.

Treatment:

If the patient experiences symptoms:

- Recognize them and calm him down (For example, “I see you're not feeling well. It is common not to feel comfortable in these situations. The procedure is going well and without problems”).
- Don't minimize what the patient is experiencing. avoid saying "Calm down, this is nothing".
- Don't rush to finish. Maintain the pace of the procedure. Rushing can cause sudden motions that can accelerate symptoms and take the patient from a presyncopal episode to syncope.
- Remember, if present, that the patient's partner may be concerned when seeing the patient with these symptoms. Sometimes a partner can also help minimize the symptoms.
- Demonstrate calm and control of the situation.

Use sensory distraction techniques:

- Application of cold compresses to one side of the patient's neck (see image of chemical reaction cold compresses below). This causes an increase in vagal tone, which can counteract the symptoms of sympathetic activation perceived by the patient.
- When the patient becomes diaphoretic, it may be helpful to use a handheld fan over the patient's face.
- Suggest maintaining a consistent breathing pattern. Avoid hyperventilation. Allow them to remove their mask (if they have one).
- Use strong odors to stimulate and distract the patient (for example, alcohol, eucalyptus, cloves, coffee, cinnamon).
- Reclining the patient (reduces hydrostatic pressure and facilitates cerebral perfusion).
- Elevation of the lower extremities (if possible) to increase venous return.

Instant cold compress. It creates an endothermic reaction by internally mixing ammonium nitrate and water. Let it cool for a short time (20-30 min). Alternatively, use an ice pack or a wet towel.

In case of syncope:

- Keep calm.
- It is usually self-limited (less than 1-2 min).
- Assess the patient's vital signs (blood pressure, pulse, respiratory rate, and oximetry, if available).
- Check with the patient about previous episodes.
- Consider a brief neurological examination and determine if it is reasonable to continue the procedure (if it occurs before starting).
- Have the patient wait comfortably in the clinic for 10-15 minutes at the end of the procedure, until the reaction disappears naturally, after which they will be fine again. Offer a glucose load (e.g. sugary drink, chocolates, etc.).

Men who have experienced pre-syncope or syncope during or after their vasectomy should not drive after the procedure until the risk of syncope has passed.

8.1.2. Persistent Bleeding

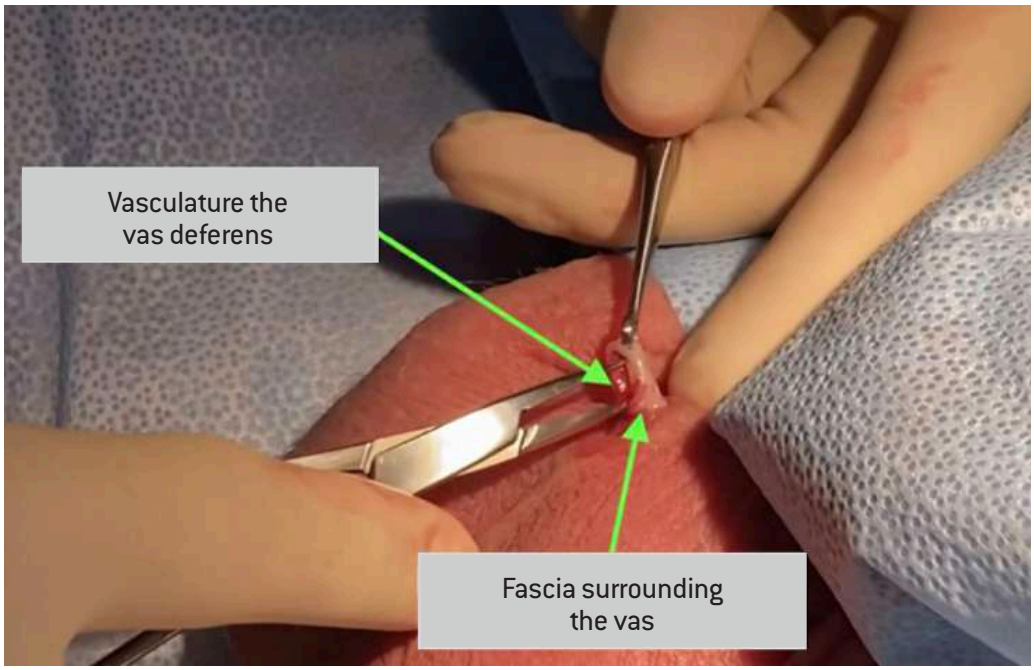
Definition

Bleeding is a common complication of any surgical procedure. This bleeding can occur at the time of the vasectomy or as a late complication after the procedure.
It is not necessary to obtain coagulation studies (or other laboratories) preoperatively. Before the procedure, talk to the patient about his fears and reduce his anxiety.

Management

Prevention:

- Perform the procedure in a minimally invasive way.
- Avoid rough handling of the spermatic cord.
- Avoid inserting the ring clamp to attempt to exteriorize the vas deferens blindly. This could damage underlying structures and make it easier to develop delayed bleeding.
- Separate and displace only the necessary amount of fascia (along with the vas deferens) from the vas deferens to avoid trauma to the vessels.
- Remind the patient to maintain minimal activity for the first 48 hours after surgery.



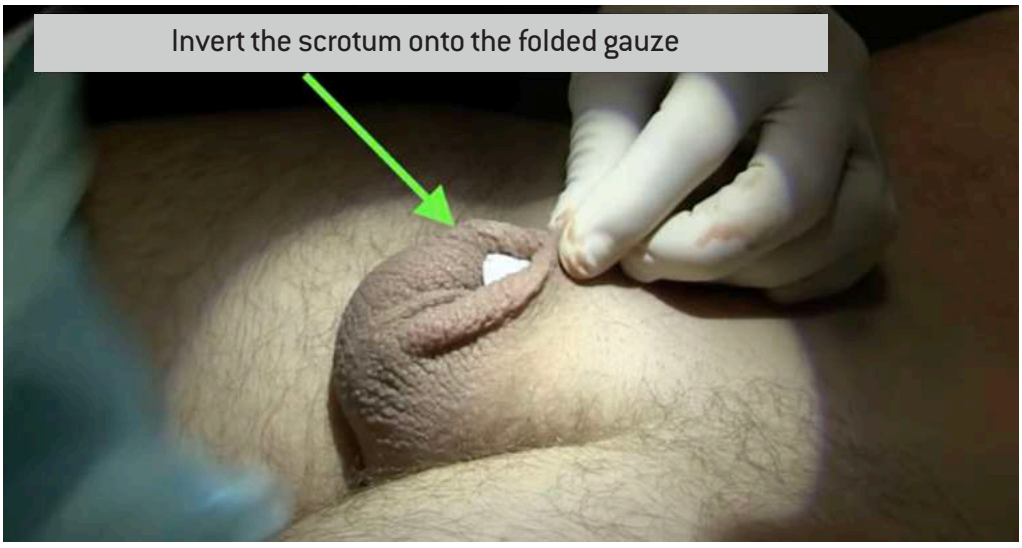
- Maintain a secure grip on the fascia to prevent a bleeding vessel from falling back into the scrotum.

Treatment:

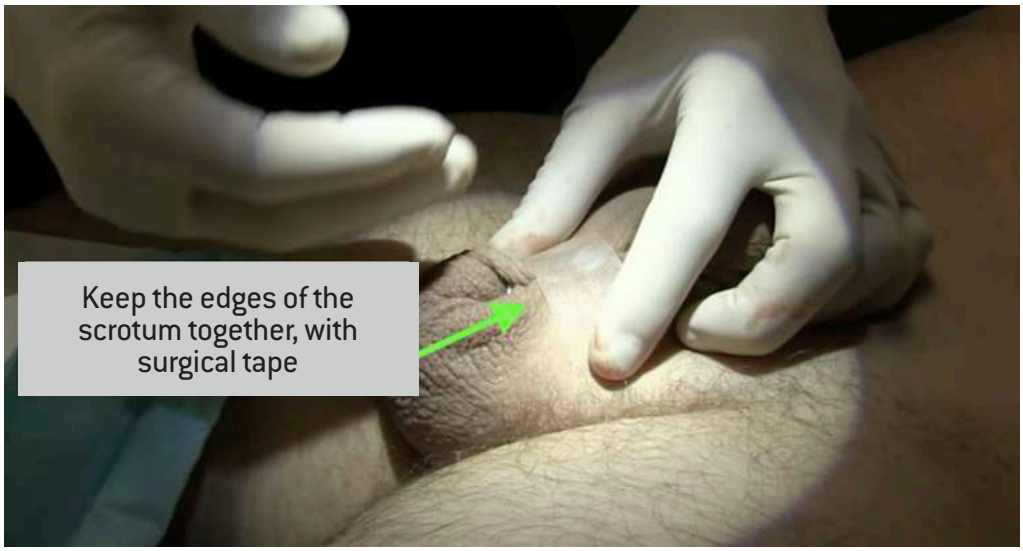
If bleeding occurs at the time of the procedure:

- If the vessel is around the vas deferens, clamp the vessel with a hemostat and use suture to tie it off.
- If the bleeding is from subcutaneous or cutaneous vessels, pressure should stop the bleeding.
- Suture is more secure on a vessel, but one can consider using thermocautery to stop bleeding. Do not use "red hot" thermocautery as this may cause more bleeding. Activate the thermocautery and allow it to cool slightly before applying it to the bleeding area.
- Once skin bleeding is controlled, apply a compression dressing using 4 x 4 inch piece of gauze, folded in 4, over the incision area. Remove in 24 hours. (see below)
- It is important that if bleeding is not controlled and it is considerable, an attempt should be made to check inside the scrotum to find the source of bleeding and attempt hemostasis.

Compressive gauze to reduce bleeding
(skin and subcutaneous) (Labrecque, 2021)



Compressive gauze to reduce bleeding
(skin and subcutaneous) (Labrecque, 2021)



Compressive gauze to reduce bleeding
(skin and subcutaneous) (Labrecque, 2021)

- For treatment of delayed bleeding, see the hematoma section below.

8.1.3. Loss of one end of the Vas Deferens after Transection and Prior to Cautery and/or FI

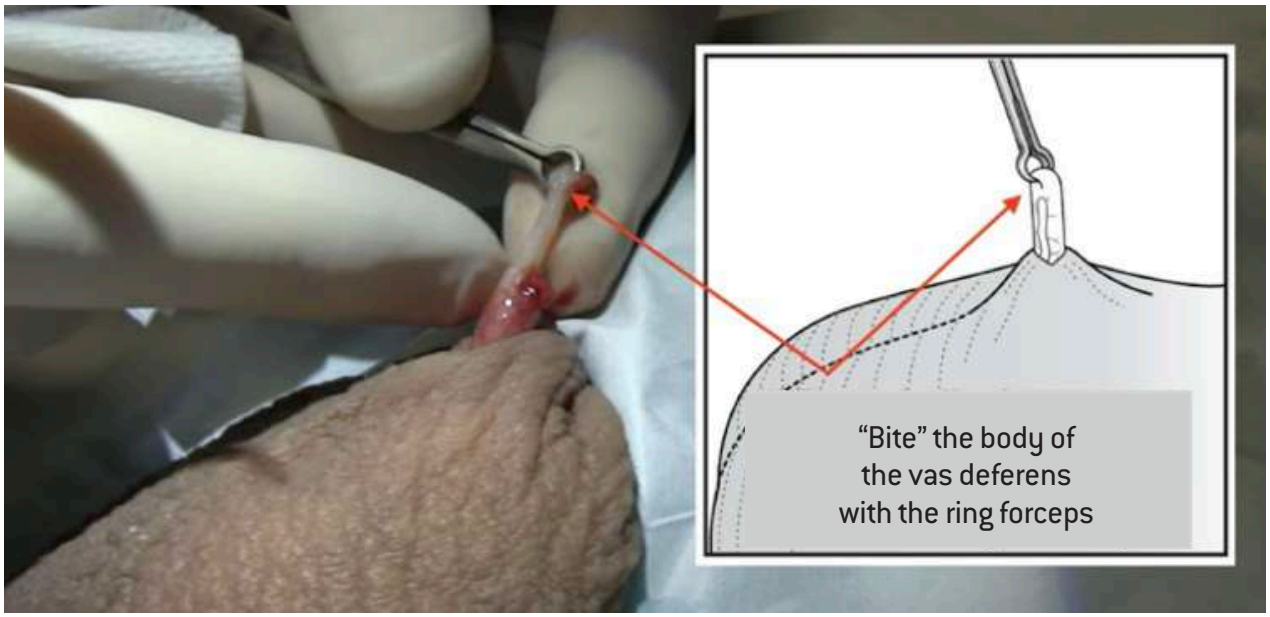
Definition

During the procedure, after one of the vas deferens has been isolated and secured, the vas may become loose from the clamp holding it. If this occurs before the vas deferens has been completely transected, then the same maneuvers performed at the beginning of the procedure to identify the vas deferens should be attempted. The vas is then delivered in the same way.
Occasionally, when transection of the canal has been completed, one (or both) ends may be released from the clamp before completing the final steps of the procedure (cauterization and fascial interposition).

Management

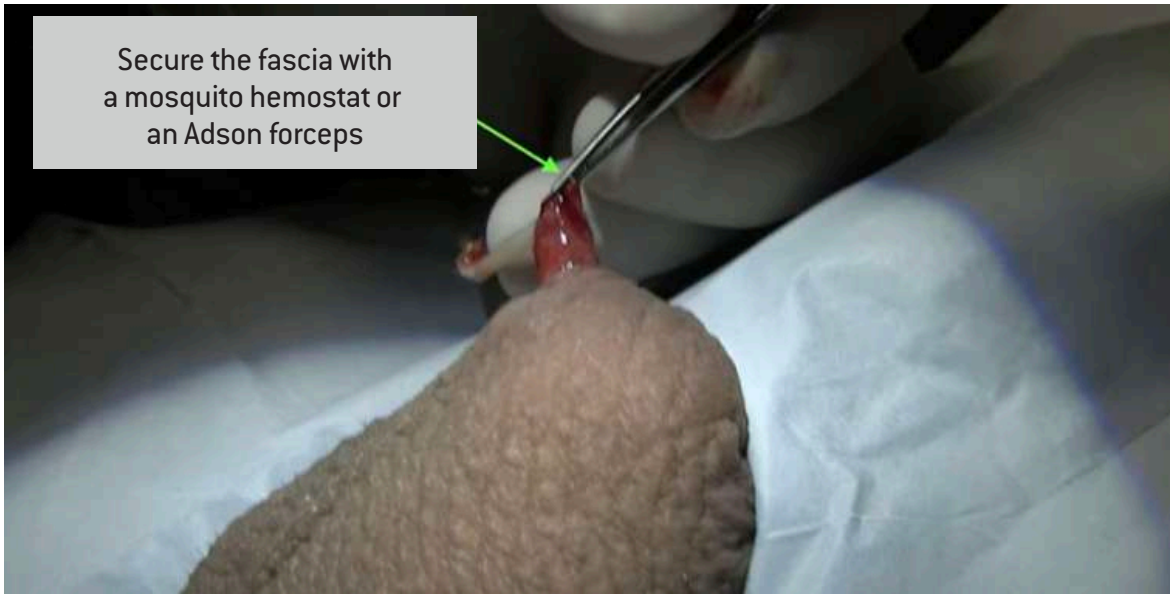
Prevention:

- Be sure to securely hold the vas deferens with the ring clamp. Avoid placing the clamp around it, instead "bite" the vas with the clamp to hold the segment.



"Bite" of the vas deferens during its removal
(Engender Health, 2007)

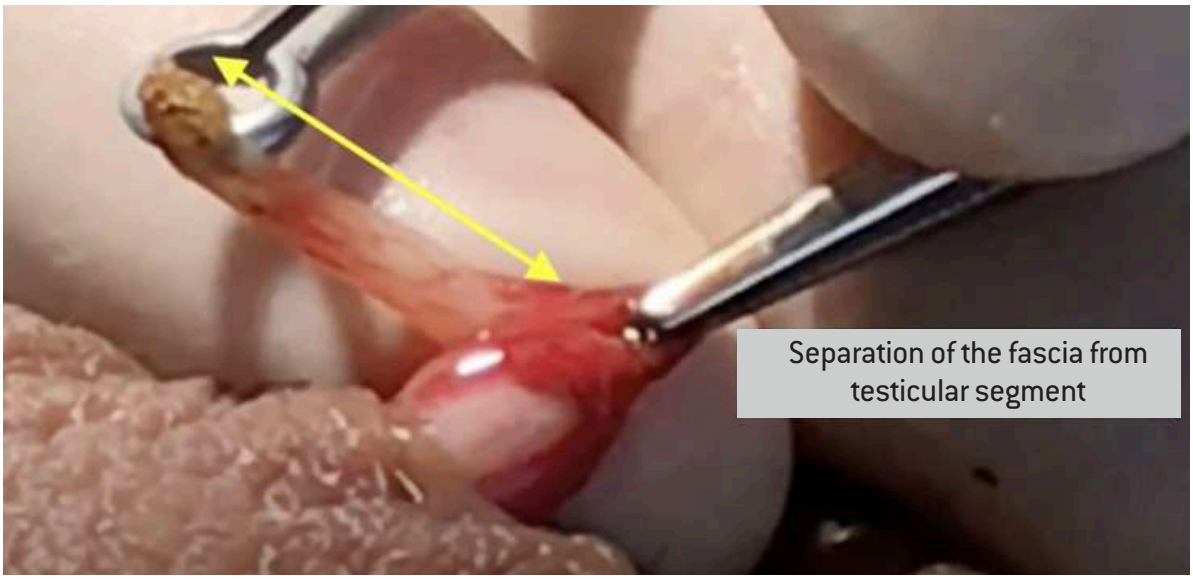
- Hold and secure the spermatic fascia with a mosquito hemostat and/or an Adson forceps, in addition to clamping it with the ring forceps.



Grasping the spermatic fascia with hemostat/Adson
(Labrecque, 2019)

Management

- If the vas was dropped BEFORE complete transection, identify it again using the routine "three-finger" maneuver used at the beginning of the procedure and proceed as usual.
- If the prostatic end of the duct has been dropped into the scrotum before completing intraluminal cautery, then proceed with interposition of the fascia.



Separation of the testicular segment of the fascia
(Guarín, 2021)

- Occasionally, the ring clamp hold on the testicular segment is lost after transection and prior to fascial interposition and/or cautery. At least one end of the vas should be retrieved.
- Retrieval of the abdominal end is preferred, as traction on the abdominal end may also bring up the testicular end. The usual 3mm ring forceps may be used, but a smaller 2 mm ring forceps, a Marmar mini-tenaculum or a small Allis forceps are preferred. Insert the instrument inside the scrotum toward the abdominal segment to grasp the end and bring it up. Some dissection will be required to bare the vas once it is retrieved. If only one end is retrieved, it may be possible to do cautery on that end and fascial interposition to cover the segment that is not retrieved. If both ends are retrieved, then the usual cautery and fascial interposition are done.
- If the vas has fallen into the scrotum after dividing and there is obvious bleeding, retrieval of one or both segments is critical to identify the site of bleeding and stop it.

8.2. Quality Assurance and Documentation

Monitoring and Evaluation:

- Keep track of intraoperative complications and management approaches to identify patterns and improve procedural techniques.

Documentation:

- Record intraoperative complications, interventions, and outcomes in the medical record for legal and quality improvement purposes.

9. Practice on the VasectoPro™ Simulator Model

General Objective

To provide participants with hands-on experience in performing the no-scalpel vasectomy (NSV) technique on the VasectoPro™ vasectomy simulator models to develop confidence and proficiency in a controlled, safe, and supervised environment.

Specific Objectives:

By the end of this module, participants will be able to:

1. Identify the components and setup of the VasectoPro™.
2. Demonstrate proper handling of NSV instruments on the VasectoPro™, including techniques for vas isolation and occlusion.
3. Execute each step of the NSV procedure on the VasectoPro™ with attention to precision and safety.
4. Recognize and correct common mistakes or challenges encountered during simulated pratice with the VasectoPro™.
5. Utilize feedback from trainers and peers to refine technical skills and prepare for live patient procedures.

9.1. Introduction to the VasectoPro™

Simulator models provide a safe and effective environment for trainees to practice the no-scalpel vasectomy (NSV) technique. VasectoPro™ to replicate the anatomy of the scrotum, vas deferens, and surrounding tissues, allowing trainees to:

- Develop technical skills without the pressure of working on live patients.
- Familiarize themselves with the use of NSV instruments.
- Gain confidence and refine their techniques before progressing to clinical practice.

VasectoPro™ is an essential training tool, bridging the gap between theoretical knowledge and real-world application.

9.2. Setting Up the VasectoPro™ Simulator Model

Proper preparation of the VasectoPro™ ensures a realistic and productive practice session.

VasectoPro™ Setup:

- The following video provides the instructions to setup the VasectoPro™:

https://youtu.be/5osKGIJCU54

- Position the simulator model securely on a table or surgical stand and functional for practice.

Required Instruments and Supplies:

- The VasectoPro™ kit includes all necessary supplies to simulate all the steps of NSV.
- A surgical drape (not included with the VasectoPro™ kit) enhances the realism of the surgical environment.

Steps for Practicing on the VasectoPro™

Trainees should practice the simulated NSV technique step-by-step on the VasectoPro™ as described in detail in Chapter 5 on vasectomy technique:

Three-Finger technique:

- Identify the simulated vas deferens through the simulated scrotal skin and isolate it using the three-finger technique.
- First, practice the three-finger technique with the simple model (gauze and tubing) included with the VasectoPro™ kit, and then with the VasectoPro™ model.

Local Anesthesia

- Simulate the administration of local anesthesia using the mini-needle technique, targeting the vas deferens and surrounding tissues.

Vas Isolation

- Use the three-finger technique to locate and stabilize the vas deferens within the scrotum and position the vas under the median raphe.
- Apply the ringed forceps to secure the vas under the median raphe, ensuring minimal trauma to the surrounding tissue.

Skin Puncture and Vas Dissection

- Use the Li dissecting forceps to create a small puncture in the scrotal skin.
- Carefully dissect through the layers of the scrotum to expose the vas deferens.
- Deliver the vas deferens through the skin opening.

Vas Occlusion

- Ensure proper occlusion to prevent recanalization simulating:
- Mucosal Cauterization (MC): Seal the vas ends with a thermal cautery device.
- Fascial Interposition (FI): to place connective tissue between the severed ends.

Completion

- Simulate assessment for bleeding.
- Return the vas deferens to its anatomical position.
- Simulate dressing of the puncture site.

10. Clinical Practice in Patients

General Objective

To enable participants to apply their knowledge and technical skills in performing no-scalpel vasectomy (NSV) procedures in patients under close supervision, ensuring patient safety, ethical care, and procedural accuracy.

Specific Objectives:

By the end of this module, participants will be able to:

1. Demonstrate proper preparation of the patient and surgical environment for NSV procedures in patients.
2. Perform the (NSV) technique in men under supervision, adhering to safety and procedural protocols.
3. Identify and manage common intraoperative challenges and complications encountered during clinical practice.
4. Communicate effectively with patients during the procedure to ensure comfort, trust, and informed cooperation.

10.1. Preparing for Clinical Practice

Clinical practice in patients is a pivotal phase in vasectomy training, where trainees transition from simulation to real-world application. Proper preparation ensures patient safety, trainee confidence, and procedural success.

Patient Preparation:

Medical History and Physical Examination:

- Confirm the patient is medically suitable for the procedure, with no contraindications such as active infections or anatomical abnormalities.

Informed Consent

- Reaffirm the patient's understanding of the procedure, its permanence, and potential risks.
- Obtain signed consent, if not already obtained, and address any last-minute concerns.
- Explain to the patient that training is taking place and obtain their consent.

Environment Setup

- Prepare a sterile workspace with all required instruments and supplies.
- Confirm availability of emergency equipment for unexpected complications.

10.2. Performing the NSV Procedure in patients

The NSV procedure on patients follows a structured, step-by-step approach to the three surgical steps of the vasectomy (local anesthesia, vas isolation and delivery, and vas occlusion). Prerequisite knowledge and skills to performing the NSV procedure in patients are:

1. Having read Chapter 7 on vasectomy techniques.
2. Reading Chapter 8 on identification and management of intraoperative vasectomy complications.
3. Successfully completing practice on the VasectoPro™ Simulator Model described in Chapter 9.

10.3. Patient Interaction and Communication

Effective communication is crucial during clinical practice to build trust and ensure patient comfort:

Explain Each Step

- Keep the patient informed about what to expect at every stage of the procedure.

Monitor Comfort

- Regularly check for discomfort or pain and administer additional anesthesia if necessary.

Provide Reassurance:

- Address any concerns calmly and professionally.
- Reiterate that the procedure is safe, quick, and effective.

11. Post-Vasectomy Care

General Objective

To equip participants with the knowledge and skills to provide effective post-vasectomy care, ensuring patient recovery, prevention of complications, and appropriate follow-up for confirming the success of the procedure.

Specific Objectives:

By the end of this module, participants will be able to:

1. Explain the importance of post-vasectomy care and follow-up in ensuring patient safety and procedural success.
2. Describe the key elements of post-procedure care, including patient instructions and recovery recommendations.
3. Provide effective patient counseling on post-procedure expectations and lifestyle adjustments.
4. Emphasize the importance of post-vasectomy semen analysis (PVSA), if available, and guide patients through the process.

11.1. Importance of Post-Vasectomy Care

Post-vasectomy care is essential to ensure a smooth recovery, prevent complications, and confirm the success of the procedure. Effective care involves providing patients with clear instructions on recovery and what to expect including the recognition of potential complications so that men understand the importance of follow-up when needed.

Goals of Post-Vasectomy Care:

- Minimize discomfort and prevent infections or other complications.
- Monitor healing and procedural success.
- Build patient confidence by addressing concerns and providing guidance.

11.2. Key Elements of Post-Procedure Care

It is recommended that patients not drive home after the procedure. Where this is unavoidable, the patient should remain under observation in the clinic for about 15-30 minutes, due to the small risk of postoperative fainting due to vagal reaction.
Patients who have undergone vasectomy should be provided with access (written and/or electronic) to post-procedural information that outlines appropriate self-care and instructions and emergency contact details.

11.2.1. Immediate Post-Procedure Care

Scrotal Support

- Advise the use of supportive tight underwear or a non-rigid athletic supporter to reduce any pain or discomfort caused by tension on the spermatic cord. This support should continue until the patient is comfortable without it.

Ice Application

- Application of ice compresses to the scrotum after surgery is optional.
- Ice application is associated with an analgesic effect caused by microvasculature alterations that decrease the production of inflammatory mediators, decrease local edema, disrupt the overall inflammatory response, and reduce nerve conduction.

- Instruct patients who wish to apply ice to use an ice pack wrapped in cloth. Apply it on the scrotum for 15-20 minutes every hour, 3-4 times on the day of the surgery.
- Avoid ice directly on the skin to prevent cold bite and avoid prolonged application to prevent local reactive vasodilatation.

Pain Management

- Recommend over-the-counter analgesics such as acetaminophen (paracetamol) as first line agent. If needed, ibuprofen can be added to manage discomfort. Make sure there is no contra-indication for use of non-steroid anti-inflammatory agent (NSAID).
- Caution against the use of aspirin as it may increase the risk of bleeding.
- Patients may feel a little bump on the surgical site on each vas. This may be associated with some discomfort for 1-2 weeks, and is usually relieved with acetaminophen or NSAID.

Activity Restrictions

- Advise patients to go home directly after surgery and to rest for the next 24-36 hours. In the absence of severe discomfort, patients can return to non-physical work on the day of the vasectomy or the day after.
- Advise patients to avoid strenuous activities, heavy lifting, or prolonged standing for at least 48-72 hours.
- Prolonged standing may increase swelling during the first week.
- Patients can resume light activities after a few days, but full physical recovery may take up to 1-2 weeks. The key is to progress slowly while also avoiding excessive inflammation.
- The need for time off from work appears to be based on several factors, including type of job, day of the week of the procedure, and patient preference.

Wound Care

- After a no-scalpel vasectomy, the small wound requires minimal care and heals quickly without the need for special medications or ointments. Strenuous activity should be avoided for a few days, and patients should monitor for any signs of infection, such as excessive redness, swelling, or discharge. With proper care, the wound typically heals within a few days of the procedure.

A piece of sterile gauze can serve as a simple dressing to keep the area clean and dry.

- This gauze can be held in place by wearing clean, snug, supportive underwear, which also helps reduce swelling and discomfort.
- Showers are permitted the day after surgery, including gentle washing of the surgical site with soap and water.
- Remove the dressing after 24 hours.
- After showering, apply another dressing if the wound is still opened.
- Maintain a dressing until the wound is fully closed to decrease the risk of infection.
- Wash hands before touching the wound (infection prevention).
- Allow three to seven days before swimming or taking a spa, making sure the wound is closed prior to this.

Resuming Sexual Activity

- Instruct patients to refrain from sexual activity for 5-7 days or until discomfort subsides (including masturbation).
- The first ejaculations may be stained with blood (pink, red or brownish).

- Emphasize the need for alternative contraception until azoospermia is confirmed through post-vasectomy semen analysis (PVSA).
- If PVSA is not available, advise using other contraceptive methods for 3 months.

Lifestyle Adjustments:

- Reassure patients that vasectomy will not affect their libido, sexual performance, or testosterone levels.
- Studies have confirmed the lack of sexual problems in men after vasectomy. In general, for the vast majority of men who undergo vasectomies, there are no negative effects on sexual function.

Many patients are concerned that vasectomy may cause changes in sexual function, such as erectile dysfunction, reduced or absent orgasmic sensation, decreased ejaculate volume, reduced sexual interest, decreased genital sensation, and/or decreased sexual pleasure. Patients can rest assured that there is no evidence that any of these problems are caused by the vasectomy.

When to seek Medical Attention

- A postoperative visit with the surgeon specifically for a physical examination of the scrotum is not routinely necessary.
- Mild swelling, bruising, and discomfort are normal and should resolve within 2 weeks.
- Patients should consult immediately if they present the following symptoms or signs:

- Progressive swelling.
- Redness or warmth on scrotal skin.
- Progressive or severe pain.
- Fever.
- Discharge or bleeding from the wound.

Identification and management of post-vasectomy complications is covered in Chapter 12.

11.3. Post-Vasectomy Semen Analysis (PVSA)

PVSA allows assessment of the success or failure of the procedure.

Instructions for Sample Collection

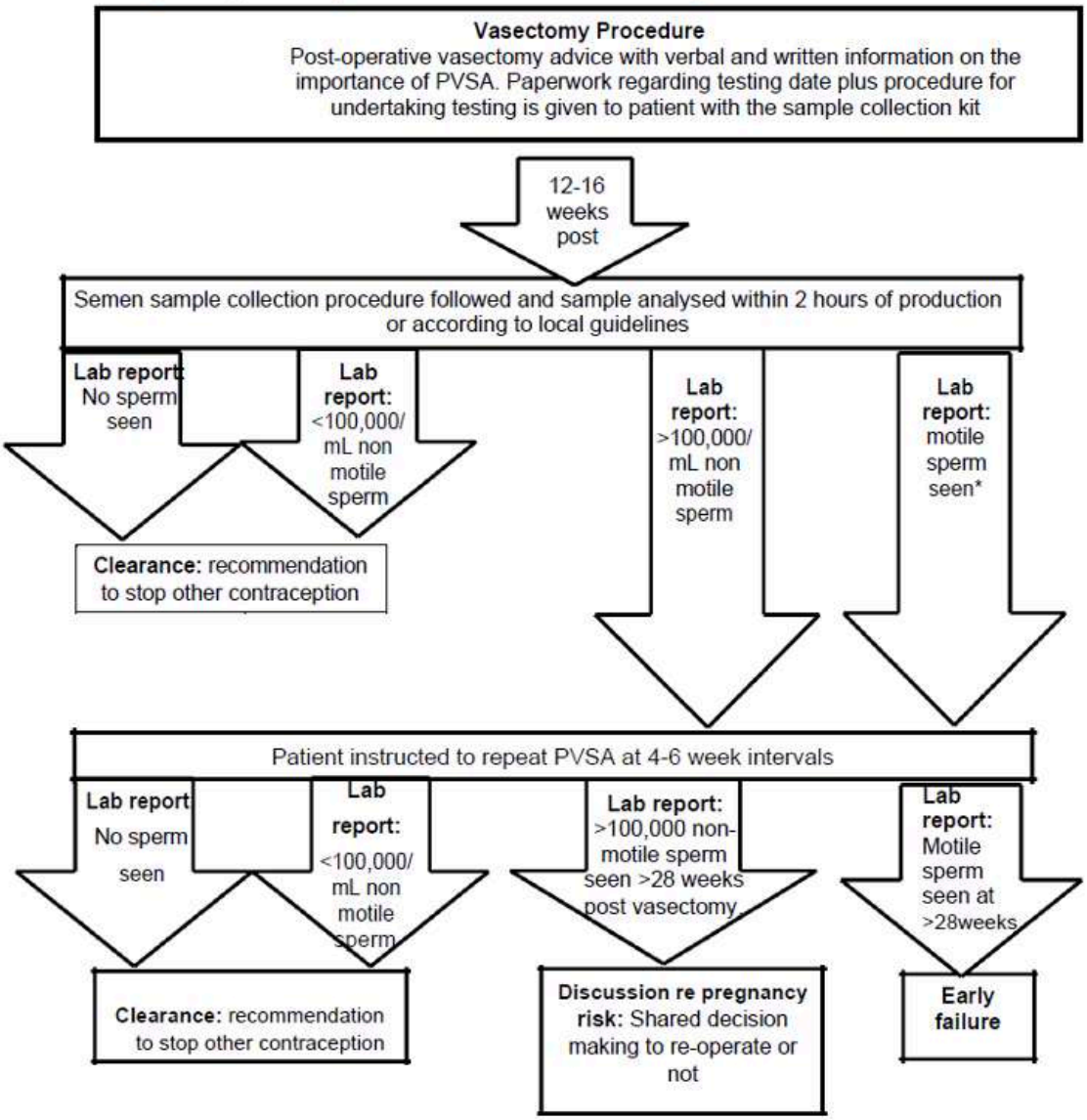
- Advise patients to provide a semen sample 8–16 weeks after the procedure or after at least 20 ejaculations.
- Patients should avoid ejaculation for 2 days before providing the sample.
- Collect the sample in a sterile container and deliver it to the laboratory within the specified time frame.

Interpreting Results

Interpretation of PVSA results depends on the time the semen sample is analysed after production.

- Fresh specimen (analyzed within 2 hours of production): Azoospermia (no sperm present) or 100,000 or fewer non-motile sperm/mL (rare non-motile sperm) confirm success. See clinical pathway for fresh semen sample below.
- Delayed specimen (analyzed more than 2 hours after production): Motility cannot be adequately assessed. Only azoospermia confirms success. See clinical pathway for postal sample below.
- Motile sperm indicates a need for additional follow-up or repeat vasectomy in rare cases.

Clinical pathway for fresh post-vasectomy semen analysis (PVSA) submission and interpretation

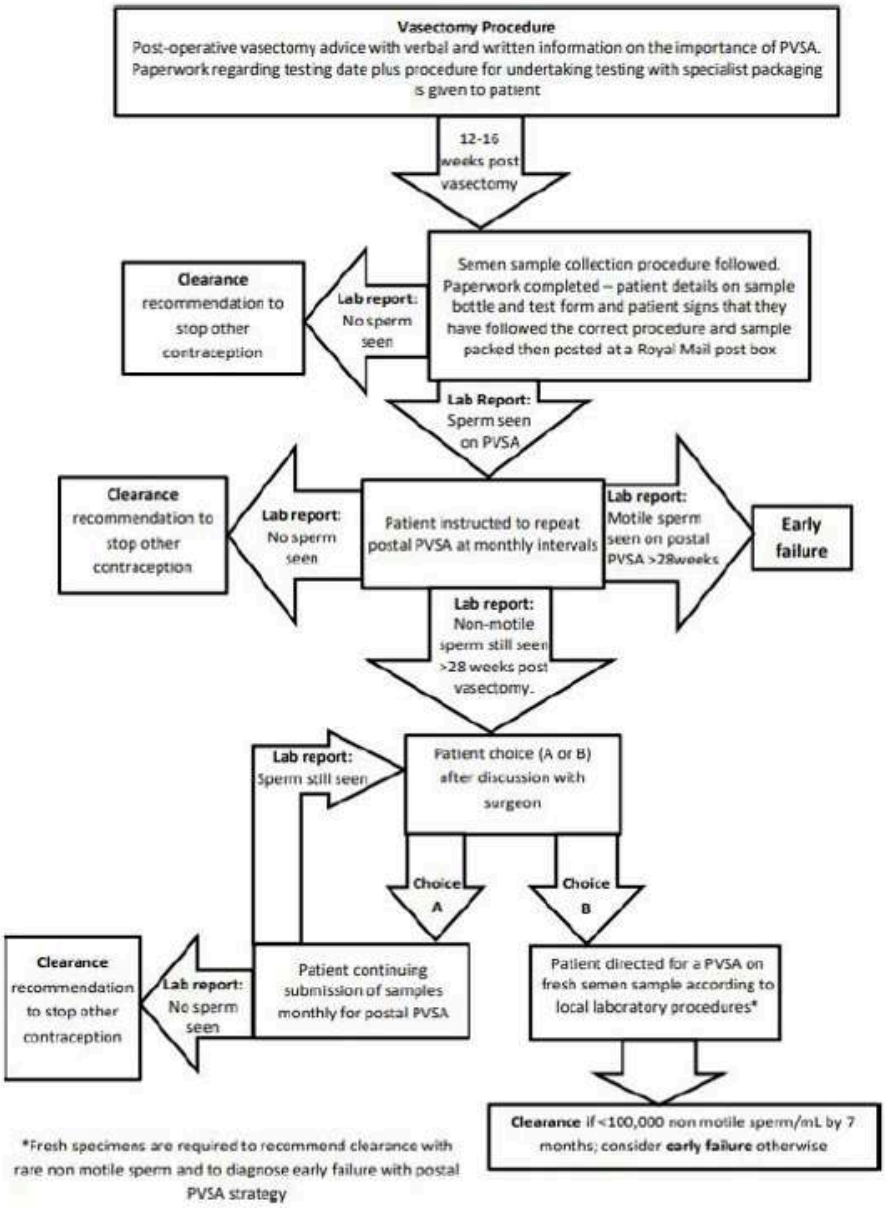


*If motile sperm numbers are low early recanalization is possible and may resolve spontaneously. However higher motile sperm counts are less likely to resolve.[1, 2]

[1]Labrecque M, St-Hilaire K, Turcot L. Delayed vasectomy success in men with a first postvasectomy semen analysis showing motile sperm. Fertility & Sterility 2005; 5: 1435-41

[2]Sokal D, Irsula B, Hays M *et al*. Vasectomy by ligation and excision, with or without fascial interposition: a randomized controlled trial. BMC Med 2004; 2 :6

Current clinical pathway suggested by the Association of Surgeons in Primary Care of United Kingdom for postal post-vasectomy semen analysis (PVSA) submission and interpretation



Source : Service Standards for Vasectomy in Sexual and Reproductive Health Services from The Faculty of Sexual and Reproductive Healthcare (FSRH) 2024

12. Identification and Management of Post-Vasectomy Complications

General Objective

To equip participants with the knowledge and skills to identify, prevent, and manage potential complications of vasectomy to ensure patient safety and satisfaction.

Specific Objectives:

By the end of this module, participants will be able to:

1. Identify common postoperative complications associated with vasectomy.
2. Describe preventive measures to minimize the risk of vasectomy-related complications.
3. Recognize warning signs and symptoms of complications such as infection, hematoma, and chronic pain.
4. Implement appropriate management strategies for postoperative complications.

12.1. Introduction to Post-Vasectomy Complications

Vasectomy is a safe and effective procedure with a low risk of complications. However, identifying and managing potential complications is critical to ensuring patient safety, satisfaction, and recovery. Most complications are minor and can be managed conservatively, but prompt recognition and appropriate intervention are essential to prevent escalation.

Key Objectives of Managing Vasectomy Complications:

- Minimize discomfort and adverse outcomes.
- Address patient concerns promptly to maintain trust and confidence in the procedure.
- Ensure high-quality care by adhering to evidence-based practices for complication management.

12.2. Common Postoperative Vasectomy Complications

12.2.1. Pain

Definition

During and after the procedure, some degree of discomfort related to the intervention may occur.

The patient usually experiences, hours after the procedure, a feeling of discomfort that radiates to the abdomen, through the ipsilateral inguinal canal, from one or both sides of the scrotum. This can be described as the type of discomfort that remains after a bump to the testicles or scrotal area.

Management

Prevention:

- Appropriate administration of local anesthetic will reduce discomfort. Make sure the patient is always comfortable during the procedure.
- Wearing tight underwear or a jockstrap for the first week may be beneficial.
- Limit physical activity during the first 48 hours, resuming most activities after the second postoperative day, except those that require greater effort (e.g. cycling, weightlifting, running, etc.) which should be delayed for up to a week.

Treatment:

- If there is pain during the procedure, additional use of local anesthetic should be considered. The procedure should not continue while the patient experiences pain, as this will cause a poor perception of the experience.
- The use of analgesics including acetaminophen (paracetamol) or NSAIDs (ibuprofen or naproxen) keeps most patients comfortable after the procedure. If necessary, the ideal is to use them according to their half-life, by schedule and ideally for 3 to 5 days for a more consistent effect.
- Pain severe enough that the patient calls the clinic or doctor is rare. If this happens the patient should be evaluated, particularly if the use of NSAIDs has been insufficient or is contraindicated.
- The use of additional analgesic medications (for example, narcotics) is extremely rare. If its use is considered, it is recommended that the patient be seen and evaluated.

12.2.2. Contact Dermatitis

This condition should be considered when redness of the scrotum is seen during the first postoperative day, and is most likely secondary to the use of the antiseptic mixture for surgical preparation.

Management

Prevention:

- Consider use of a topical low-potency local corticosteroid (e.g., l hydrocortisone 1%), avoiding application directly to the surgical wound.

Treatment:

- The patient can clean the preparation area with a wet compress, without products. Avoid getting the incision area wet.
- Consider use of a low-potency local corticosteroid (e.g., topical hydrocortisone 1%), avoiding application directly to the surgical wound.

12.2.3. Scrotal Ecchymosis

Definition

A purplish discoloration may appear "secondary to subcutaneous bleeding after the procedure" under the skin of the scrotum.

Scrotal ecchymosis can appear extensively, affecting the scrotum and even the base of the penis. Its presentation can occur from the first postoperative day until days later. This is usually painless.

Management

Prevention:

- Careful cauterization of bleeding sites under the skin, particularly at the margins of the incision.
- Applying ice, as described above, helps reduce its occurrence.

Treatment:

- If this occurs, remind him to the patient that this will not affect their health and will resolve spontaneously. Be sure to set appropriate expectations regarding the progression of its appearance (purple, yellowish, then greenish before fading). This can take several weeks to resolve fully.

12.2.4. Scrotal edema

Definition

Inflammation can occur on the dermis, without redness, after vasectomy. This may be due to excessive manipulation of the scrotum during the procedure.

Management

Prevention:

- Avoid excessive manipulation of the scrotal structures when attempting to identify the vas deferens. Remember that this can not only cause discomfort and inflammation of the skin, but in turn causes increased muscle tension that could make the procedure difficult.

Treatment:

- Scrotal support and administration of NSAIDs (ibuprofen or naprosyn).
- Ice pack application (indirectly, over underwear or scrotal support) for the first 24 hours after the procedure (apply for 30 minutes, then remove for 30 minutes).

12.2.5. Non-infectious inflammation of the surgical site ("acute granuloma")

Definition

This is the most current complication encountered after vasectomy. Non-infectious inflammation limited to the surgical site on the vas deferens may appear 3 to 7 days after the surgery. It is characterized by a painful, mobile, and small lump (1-2 cm) at the surgical site. It can be bilateral, but most commonly occurs only on one side. It is often described as an "acute granuloma". The cause is unknown. An immune reaction to sperm cells and a thrombophlebitis of small vessels have been hypothesized as possible causes. There is no concurrent signs of infection, including scrotal oedema, redness, large swelling, or fever.

Treatment:

- Administration of NSAIDs (Ibuprofen 200 mg 3 tabs TID or naproxen 500 mg BID x 5-7 days).
- Support/Ice/Rest.
- Close follow-up and monitoring for infection.
- Pain should subside within 48 hours (the nodule may persist for weeks).
- If no response and no infection: Prednisone 50 mg daily x 7 days, 25 mg daily x 7 days, 12.5 mg x 7 days. Alternatively, prednisone 60 mg x 3 days, 40 mg x 3 days and 20 mg x 3 days.

12.2.6. Infection

Definition

Infections are rare. Large series have reported a postoperative complication rates of infection and hematoma of 1 to 2% in most series. For this reason, the opinion of the American Urological Association (AUA) is that patients should be warned that the risk of hematoma and wound infection after vasectomy is approximately 1 to 2%.
The patient usually presents scrotal edema associated with erythema and pain. Fever and purulent discharge may also appear.

Prevention:

- Encourage good hygiene practices (shower and cleaning of genital parts) prior to the vasectomy.
- Adequate preparation of the surgical area with antiseptic solution.
- Maintain proper sterile technique.
- Avoid prolonged surgical time and excessive manipulation.

Treatment:

- Administration of coverage antibiotics for gram positive and gram negative bacteria:

i. Levofloxacin (Levaquin®) 500 mg per day x 7-10 days.
ii. Amoxicillin/clavulanic acid (Clavulin®) 875mg/125mg twice daily for 7-10 days.

- Scrotal support and ice administration during the first 48 hours after the infection manifests.
- Reevaluate antibiotic response 48 hours after initiation.

12.2.7. Hematoma

Definition

The development of a large scrotal hematoma is the most feared complication encountered with vasectomy.

Large series have reported postoperative complication rates of infection and hematoma of 1 to 2% in most series. For this reason, the opinion of the American Urological Association (AUA) is that patients should be warned that the risk of hematoma and wound infection after vasectomy is approximately 1 to 2%.

Management

Prevention:

- Use precise and minimally invasive techniques to reduce tissue trauma.
- Avoid excessive dissection to prevent damage to blood vessels and surrounding structures.
- Always maintain adequate hemostasis during the procedure.
- Remind the patient of the postoperative care instructions.

Prevention:

The management of the hematoma depends on its progression:

- In cases where the hematoma forms rapidly and continues to grow in the immediate postoperative period, an urgent consultation with urology may be necessary for its evacuation.
- When the hematoma has been contained and does not continue to grow, management requires maintaining the patient's comfort with the administration of non-narcotic analgesics and anti-inflammatories.

- Suggest prolonged use (2 to 4 weeks) of scrotal support, along with intermittent ice administration (during the first 48 hours).
- Follow up with the patient to identify possible development of early infection.
- Remind the patient that hematoma resolution may take weeks to months.

12.2.8. Congestive Epididymitis

Definition

This presents as unilateral, although occasionally bilateral, scrotal pain along with localized pain and/or discomfort in the epididymis that may radiate to the ipsilateral inguinal area. This can be aggravated by movement. The epididymis feels enlarged, swollen, and even painful.
This can occur weeks or even years after the procedure and is believed to be related to retrograde congestion of the epididymis. Persistent or intermittent discomfort lasting beyond three months (chronic pain associated with congestive epididymitis or to other causes) is known as "post-vasectomy pain syndrome". This requires a thorough evaluation to rule out nerve involvement or other underlying causes.

Management

Prevention:

- Performing an "open" vasectomy (with the testicular end unconcluded) can reduce the risk of engorgement (congestion).
- This is limited and usually resolves spontaneously after persisting for 1 to 3 weeks.
- Educating and reassuring the patient about this process is essential.

Treatment:

- First stage (frequent 5%)
- Anti-inflammatory for 7-14 days:

    i. Ibuprofen 600-800 mg every 8 hours, or
    ii. Naproxen 500 mg every 12 hours

- Hot scrotal bath (testicles only):

Metallic bottle. Heat reduces sperm production and the congestion of the epididymis.

i. Heat water to 116˚F/46.7˚C (not boiling) and place it inside a metal bottle (see image below). The metal bottle reduces sperm production and epididymal congestion.
ii. Place the bottle for 45 minutes on the scrotum once a day, for 3 weeks. Warn patient to be careful to avoid burns.

Second stage (rare, <1%)

- Consider the following interventions

i. Prednisone:
    1. 50 mg per day x 7 days, then.
    2. 25 mg per day x 7 days, then.
    3. 12.5 mg per day x 7 days.

ii. Amitriptyline:
    1. 10-25 mg every day, at night x 14-30 days.

iii. Testosterone:
    1. 200 mg intramuscularly every 2 weeks for 3 months.

Third stage (very rare <0.1%)

- Consult to urology to consider:

iv. Blockage or denervation of the spermatic cord
v. Vasectomy reversal

12.2.9. Sperm Granuloma

Definition

This is an inflammatory reaction that occurs in response to the presence of sperm at the site of division of the vas deferens. Although this is common, only about 1.5% of patients report experiencing the presence of a painful nodule.

Management

Prevention:

- Due to its natural origin as a response to the procedure, there is no way to avoid it in every patient. However, it is important to educate the patient accordingly when it occurs.

Treatment:

- Consider the following interventions:
- Anti-inflammatory for 7-14 days:

i. Ibuprofen 600-800 mg every 8 hours, or
ii. Naproxen 500 mg every 12 hours

- Granuloma infiltration:

iii. Needle 27g or 30g
iv. Lidocaine 2% without epinephrine 0.5 cc + triamcinolone 40 mg/ml 0.5 cc.

- Surgical excision

12.3. Quality Assurance and Documentation

Monitoring and Evaluation:

- Keep track of complication rates to identify patterns and improve procedural techniques.

Documentation:

- Record all complications, interventions, and outcomes for legal and quality improvement purposes.

13. Quality of Care in the Provision of Vasectomy Services

General Objective

To enhance participant understanding and implementation of quality standards in vasectomy service delivery to ensure safe, patient-centered, and effective care.

Specific Objectives:

By the end of this module, participants will be able to:

1. Define quality of care and explain its significance in the context of vasectomy services.
2. Identify key components of quality care in vasectomy service provision, including safety, efficiency, and patient satisfaction.
3. Implement standard operating procedures (SOPs) to ensure consistent and high-quality service delivery.
4. Monitor and evaluate service quality using tools and metrics, including patient feedback and outcome assessments.
5. Address barriers to quality care, such as stigma, misinformation, or logistical challenges, and propose solutions.

13.1. Introduction to Quality of Care in Vasectomy Services

Quality of care is the cornerstone of vasectomy service provision. It ensures patient safety, satisfaction, and trust in the healthcare system. In the context of vasectomy, high-quality care directly contributes to better patient outcomes and increased acceptance of male sterilization as a viable family planning method.

Definition of Quality Care:

- Safe, effective, and patient-centered services that meet clinical standards and respect patient rights.
- Care that is timely, equitable, and efficient, minimizing unnecessary delays or complications.

Significance of Quality Care in Vasectomy Services:

- Reduces the risks of complications and ensures procedural success.
- Builds trust between patients and healthcare providers.
- Promotes the adoption of vasectomy as a reliable contraceptive option, contributing to global family planning goals.

13.2. Components of Quality Care

Clinical Excellence:

- Adherence to evidence-based protocols and guidelines in vasectomy procedures.
- Proper preoperative assessment, accurate surgical techniques, and effective postoperative care.

Patient-Centered Care:

- Respecting patient autonomy and confidentiality.
- Providing clear and accurate information to help patients make informed decisions.

Effective Communication:

- Addressing patient concerns with empathy and professionalism.
- Ensuring that patients understand the procedure, its risks, benefits, and follow-up requirements.

Safety and Infection Control:

- Ensuring aseptic techniques are followed throughout the procedure.
- Regularly sterilizing instruments and maintaining a clean clinical environment.

13.3. Standard Operating Procedures (SOPs)

Pre-Procedure:

- Conduct thorough patient assessments to rule out contraindications.
- Obtain informed consent, ensuring patients understand the permanence of the procedure.

During the Procedure:

- Follow the NSV technique for minimal invasiveness and fast recovery.
- Ensure precise vas isolation and occlusion to prevent procedural failure.

Post-Procedure:

- Provide clear instructions for post-vasectomy care and activity restrictions.
- Emphasize the importance of PVSA to confirm success or using alternative contraceptive methods for 3 months if PVSA is not available.

13.4. Monitoring and Evaluation of Service Quality

Learning from Data:

- Use quality metrics and feedback data to identify areas for improvement.
- Regularly review complication rates and patient outcomes to refine clinical practices such as infection rates, complication rates, patient satisfaction scores, and PVSA completion rates.

Patient Feedback:

- Use structured feedback tools (e.g., surveys or interviews) to gather insights on the patient experience.
- Address any negative feedback to improve service delivery.

Provider Competency Assessments:

- Participate in refresher courses and workshops to ensure maintaining high levels of competency.
- Regularly evaluate skills and performance of vasectomy using standardized checklists.
- Stay updated on advancements in vasectomy techniques and patient care protocols.

13.5. Addressing Barriers to Quality Care

Stigma and Misinformation:

- Educate communities and patients to dispel myths about vasectomy, such as its impact on masculinity or sexual function.

Resource Limitations:

- Ensure the availability of sterilized instruments and adequate clinical facilities.
- Advocate for increased funding and support for male sterilization programs.

Cultural Sensitivities:

- Adapt counseling and service delivery to respect local cultural and social norms.
- Communicate in a culturally appropriate and respectful manner.