
Procedures in Family Practice

Vasectomy

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Bilateral vasectomy is a common method of achieving elective sterilization in men. Knowledge of male genital anatomy is important in the performance of this procedure as well as in screening patients with anatomical contraindications. Careful counseling techniques will help avoid medicolegal problems. There are several operative techniques used to perform a vasectomy. Postoperative evaluation and semen analysis should be accomplished to recognize and allay complications. Major complications are rare; minor complications are relatively frequent, with early diagnosis and treatment important in hastening recovery. Psychological consequences are rare. Thus, vasectomy is a relatively safe, inexpensive, and dependable contraceptive procedure.

Bilateral partial vasectomy has become a popular method of achieving permanent sterilization in men. It is estimated that 500,000 vasectomies are performed in the United States each year.^{1,2} Family physicians are among those whose practices include sterilization procedures, and they are in a unique position to help their patients with decisions regarding permanent sterilization.³

Indications

Voluntary sterilization is viewed by most as the only indication for vasectomy. There remain some debatable indications, including the prevention of postprostatectomy epididymitis and the treatment of epididymitis.⁴

Counseling

Preoperative counseling entails perhaps the most important aspects in the consideration of vasectomy. Philosophically, the physician is in a position to change a person at his or her request from a state of "normality" to a state of "abnormality" or sterility. Therefore, each physician who wishes to become involved in population control procedures must weigh his or her own philosophy, religion, and

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social ideals prior to attempting to counsel patients. In addition, because this procedure is more or less elective, each physician must fully inform his patients regarding all aspects of contraception, procedures, methods, and complications.

Laws restricting vasectomy for male sterilization are few; in fact, no state except Utah provides legal obstacles to elective vasectomy. Three states require the consent of the wife. These laws are subject to change, and the physician should be familiar with the laws governing sterilization in his area and state.

The counseling session should consist of two basic parts: a discussion of sterilization in general, and vasectomy counseling. When considering sterilization, the physician should discuss with the couple or individual (whichever the case may be) the following several areas:

1. The procedure is elective; patients should be aware that they are asking to be changed from "normal" to sterile.

2. The physician should use the session to gain insight into the strength of the marriage and motivations for the procedure. This is difficult to do unless the couple is seen together; however, it is not impossible to properly counsel separately under extenuating circumstances. The couple should be emotionally stable and not seeking to salvage a deteriorating marriage through sterilization. An effort should be made to rule out sexual problems within the marriage. Sterilization is not a cure for decreased libido, and this should be made known to the patient prior to the procedure. Individual psychological problems should be ruled out.

3. Alternatives should be discussed, with emphasis on the permanence of operative sterilization. Other methods of contraception and a description of all methods of sterilization should be included. Relative risk factors should be discussed.

4. An inquiry should be made into the existence of any medical problems that might influence the patient's decision regarding sterilization. Previous surgery to the scrotal area, as well as the presence of a varicocele or hydrocele, makes vasectomy more difficult and may influence a decision. Also, if the wife has a gynecological problem that would result in a hysterectomy, vasectomy would be unnecessary.

5. Loss of spouse through death or divorce and the loss of children should be contemplated and

discussed, as it might bear on the decision for permanent sterilization.

When the decision for vasectomy has been made, more specific counseling can be undertaken.

1. The operative procedure should be discussed, and a step-by-step description should be included. Anesthesia should be discussed with inquiry into the possibility of allergy to local anesthetic.

2. The patient should be made aware of the complications of the procedure. Include a frank discussion of granulomas, orchialgia, hematoma, infections, autoantibodies, local postoperative pain, and recanalization. Failure to achieve azoospermia can be tested for, and it should be emphasized that follow-up sperm counts of zero will indicate sterility. Reoperation may be necessary if complications occur.

3. Reversibility should be discussed simply because it is becoming more and more common for patients who have had vasectomy to choose to undergo vasovasostomy (ie, vasectomy reversal).⁵⁻⁸ It should be emphasized that reversal may not be possible, and pregnancy rates following the operations are variable.

4. Sperm banking is done in some centers.⁹ There is a gradual loss of motility, with 50 percent loss at three years¹⁰ and up to 90 percent at five years.¹¹ Friberg and Gemzell reported pregnancies in 26 of 187 attempts at conception using banked sperm.¹²

5. Preoperative and postoperative instructions should be discussed.

It is good to anticipate some of the more common questions concerning vasectomy: Does it decrease libido? Will it cause impotence? What happens to the sperm? Can it be reversed? Can sperm be frozen and used later if fertility is desired?

Specific vas counseling should include a thorough physical examination, concentrating on the area of operation. Evidence of hernia, varicocele, or hydrocele would lead one to consider consultation. Previous repair of inguinal hernia, varicocele, or hydrocele makes vasectomy more difficult, but not impossible. Testicular tumors should be ruled out.

The counseling may be done in a number of ways using film strips, television recording tapes, movies, lectures, or one-on-one presentations. Following the counseling, it is useful to give patients a booklet relaying the salient features of the

procedure. The patient's medical record should also include points discussed during the counseling session. Each physician is ultimately responsible for the vasectomy counseling provided, and he should constantly review the important points to ensure to his or her satisfaction that patients fully understand all aspects of the operation.

Medicolegal aspects of vasectomy counseling have recently been brought to the forefront by court decisions in malpractice cases. Approximately 50 percent of malpractice claims against urologists were related to vasectomy procedures they performed. The claims primarily involve two areas of negligence: surgical complications and failure to inform the patient of possible complications.¹³

Anesthesia

Local anesthetic is the method of choice. Infiltration of 1 to 2 mL, producing a skin wheal, followed by 1 to 2 mL in perivascular tissue proximal to the anticipated point of operation will provide a relatively pain-free operation. Lidocaine (Xylocaine), 1 percent or 2 percent, will provide anesthesia for approximately one hour. Roen¹⁴ advocates the use of mepivacaine (Carbocaine), which will produce anesthesia for approximately two to three hours.

Preoperative Medication

Preoperative medication is an adjunct found to be useful to help allay the apprehension that may surround this procedure. Oral medications, such as 5 to 15 mg of diazepam (Valium) or 100 mg of meperidine (Demerol), given one hour prior to surgery will reduce apprehension. Intravenous diazepam (10 mg) and meperidine (100 mg) given just prior to the operation will result in a less apprehensive, moderately sedated patient. Relaxation of the cremasteric muscles makes the operation technically easier.

Blandy in his 1979 article⁴ warned of the phenomenon, recognized by Lewis in 1975, of bradycardia following pulling on the vas deferens. He noted 30 percent of subjects tested had measurable bradycardia, and in his experience of seven years, two cardiac arrests were apparently caused by this phenomenon. The mechanism was thought to be due to vagal stimulation, so he advocates the use

of atropine as a preoperative medication, especially in extremely apprehensive patients. The more frightened the patient appeared, the more likely he was to exhibit this phenomenon.

Equipment

A warm, well-equipped room is a necessity. A minor surgical suite should always include a full range of resuscitative equipment and medications.

Instruments should be sterilized and sterile technique should be used throughout the procedure. The following should be included on a vasectomy instrument tray: needle holder, knife handle, #15 blade, 3-ring 5-mL glass syringe, a 1-in 18-gauge needle and a 26- or 27-gauge needle, two Allis clamps, two "baby" Babcock clamps, two small straight hemostats, two towel clips, Iris scissors, suture scissors, Addison forceps, a small Weck hemoclip (optional), eye drape, and a supply of 4×4 gauze sponges.

The following items should be on hand: local anesthetic—1 percent or 2 percent lidocaine (Xylocaine) without epinephrine, 1 percent mepivacaine (Carbocaine); sutures—4-0 chromic, 3-0 chromic, 4-0 Dexon, 3-0 Dexon, 4-0 plain (all swaged on a gastrointestinal noncutting needle); specimen bottles with preservative and labels; fulgurator or electrocautery with needle tip; 10-percent nitrofurantoin solution (optional).

Antiseptic Preparation

Although a shave preparation is not absolutely necessary, it is technically more convenient. Infection rates are probably not influenced by shaving; however, in vasectomy, it has not been studied. The patient is given preoperative instructions to shave the anterior scrotum and bathe afterward to remove loose hairs. The area is washed and painted with providone-iodine soap and solution at the time of surgery.

Operative Technique

Skin incisions used are (1) lateral superior scrotum (most common), (2) midline vertical, (3) midline horizontal, and (4) suprascrotal (near the

external inguinal ring). Midline incisions require more technical skill in the manipulation of the vas to the middle of the scrotum. The incision should extend 1 to 2 cm.

The vas is palpated through the scrotum and is manipulated to the position of the desired incision. Yeates¹⁵ recommends operating on the vas at the highest position possible in the scrotum to facilitate vasovasostomy in case the patient wishes reversal. Local anesthetic is injected with a 26- or 27-gauge needle, into the skin and then in the perivascular tissue proximal to the area of operation. The incision is then made. Some physicians prefer to isolate and clip the vas to the skin with a towel clip prior to making an incision to keep the vas from sliding from beneath the skin back into its normal retroscrotal position. Blunt dissection with a mosquito hemostat will help isolate the vas and its sheath from the perivascular adventitial tissue. It is then grasped with an instrument such as an Allis clamp, baby Babcock clamp, or Kidd's vasectomy forcep. An incision is made through the sheath down to the vas, avoiding the blood vessels, which may be visualized on the surface of the sheath. The vas may be separated from the sheath, using blunt dissection, leaving the vas isolated.

At this point there is variability in technique.

1. Carlson¹⁶ recommends removal of 2 to 3 inches of vas deferens and the ligation of ends with chromic or silk suture.

2. Hanley¹⁷ recommends two methods: After removal of 1 to 2 cm of vas, either it is folded upon itself with ligation, or the ends are overlapped and ligated.

3. The technique of Schmidt,¹⁸ which is the most widely accepted today, involves division of the vas, excision of a small specimen for pathologic identification purposes, electrofulguration of the mucosa of the vas, and fascial interposition, burying the distal end (inguinal end).

4. Moss^{19,20} advocates the use of stainless steel Weck clips. Originally, he recommended attaching clips to each divided end after excision of a section, then clipping the fascial sheath to each end. Subsequently, Schmidt modified Moss' technique. Stainless steel clips are used instead of suture to isolate the ends of the vas. By approximating the fascial sheath with clips, it is interposed between the two ends, which are fulgurated as in Schmidt's technique, the so-called "one clip, no stitch" technique.¹⁸

5. Shapiro and Silbert²¹ studied the open-end vasectomy in which the proximal end was allowed to remain unligated and the distal end ligated. They demonstrated that with intentional granuloma formation, there was less pain postoperatively. This new method is controversial, and until further studied, it cannot be recommended.

If a portion of the vas is excised, Yeates¹⁵ recommends the removal of no more than 1 cm of vas to facilitate vasovasostomy were the patient to change his mind. If ligatures are to be placed on the vas, they should be tied before excision of the segment.

Technically, concealment of the distal end is facilitated if ligation of the proximal end includes fascial sheath. Inclusion of the sheath in the distal ligature must be avoided. Electrocautery or ties of plain suture (3-0 or 4-0) are used to provide hemostasis.⁴

Performance of a bilateral procedure must be ensured. Carefully palpating the selected vas to the external inguinal ring prior to making the incision ensures continuity. Postoperatively, continuity of both vasa should be noted through palpation to the external rings. Skin closure with suture of choice or the open method is permissible. An antibiotic ointment may be applied to the wound.

Postoperative Care

Scrotal support should be provided until postoperative discomfort has abated (usually no longer than 72 hours). Ice packs are used for approximately 12 hours postoperatively to help reduce swelling and discomfort. Analgesia of choice may be used, although it is seldom necessary. Instructions are given to the patient to avoid strenuous activity for 72 hours. Intercourse may be resumed after that time.

A postoperative visit should be scheduled for one to two weeks following the operation. The patient is asked to report swelling immediately.

Postoperative Semen Analysis

Arrangements and instructions for postoperative semen analysis should be made. Specimens may be obtained by coitus interruptus or masturbation and brought promptly to the laboratory for

analysis. There is no standard time for collection of specimens. Studies by Freund and Davis²² and Marshall and Lyon²³ demonstrate that although clearance is variable, it usually occurs after 12 ejaculations. The problem is addressed by the Planned Parenthood Federation of America, which recommends the first analysis after 15 ejaculations. If nonmotile sperm are present, repeat the analysis after 25 ejaculations. If motile sperm are present after 25 ejaculations or if non-motile sperm are present after 50 ejaculations, serious consideration should be given to a second operation.¹

Complications

Vasectomy is not to be taken lightly, as evidenced by the following potential complications.

Bradycardia is said to occur in approximately 30 percent of all patients. Cardiac arrest has occurred rarely. Atropine as a preoperative medication may be used in extremely apprehensive patients, and resuscitative equipment and drugs, including oxygen, should be immediately available in any minor operating suite.

Hematoma of the scrotum is a common complication, occurring in about 10 percent of all vasectomies. Hematomas of a degree to require therapy occur in 1.5 percent of patients.²⁴ Management consists of hospitalization and careful observation. If there is evidence of the hematoma increasing in size, the hematoma should be evacuated in the operating room, and a search should be made for the bleeding site. Removing the blood clot decreases morbidity.²⁵

Infections can occur in varying degrees, from mild erythema and stitch abscess to fulminant Fournier's gangrene,^{4,26} which is a mixed anaerobic infection of the scrotum and penis. Cellulitis and infections should be treated vigorously. Reports of rates of infections vary from 3 percent to 12 percent.^{27,28} Prophylactic antibiotics do not prevent infection complications.^{29,30}

Granuloma formation from extravasated sperm either at the vas or in the epididymis is a common complication and is undoubtedly unavoidable.³¹ Controversy surrounds attempting to close the proximal vas. Epididymal granuloma makes vasovasostomy more difficult. Vas granuloma predis-

poses to recanalization and can even erode fascial barriers, resulting in recanalization. Schmidt and Morris³² reported granuloma at the vas can be reduced by using the method of fulguration of the mucosa. Other reported rates of granuloma formation vary from 7.3 percent to 50 percent. Approximately 10 percent are symptomatic. They may be nonpainful (vasitis nodosa) or extremely painful to palpation or during intercourse and ejaculation. Treatment consists of anti-inflammatory agents, and ultimately, excision if the pain is debilitating or persistent.²⁴ Vasovasostomy has been done to cure refractory lesions.³³

Recanalization occurs rarely. It is more common with granuloma formation. Reported rates range from 3.3 percent to nil.³⁴ Esho and Cass³⁵ reported a 0.5 percent rate of failure; Klapproth and Young³⁶ reported a 0.6 percent rate in large studies. Diagnosis is through repeated sperm counts, and treatment is reoperation. Recanalization may occur up to six years postvasectomy. Contributing factors to the dynamics of recanalization are (1) weakness at the proximal vas with blowout under increased pressure, (2) open distal vas, or (3) the sheath left intact to direct sperm.³⁷

Failure to achieve azospermia may be due to other causes, such as incorrect identification of the vas. Careful physical examination and pathological specimen examination will prevent this unfortunate occurrence. Reduplication of the vas is rare, but it is reported.³⁸

Congestive orchalgia is more common in patients without granulomata at the vas site. Symptoms include pain with ejaculation and sexual excitement.

Epididymitis is also a common complication. In a study of over 2,000 vasectomy patients, Leader et al³⁹ found epididymitis the most common complication regardless of whether ligatures or clips were used. The condition is characterized by heat, swelling, and tenderness of the epididymis. Treatment includes antibiotics and anti-inflammatory agents.

Vasocutaneous fistula formation is reported. A painful recurrent pimple on the scrotum postvasectomy suggests this complication. A smear of the contents of the lesion will confirm this condition. Reoperation is necessary.²¹

Congenital absence of the vas occurs in approximately 0.1 percent of patients. Bilateral absence is rare. A history of congenital absence of the kid-

ney is an indication for congenital absence of the ipsilateral vas.

Desire for reversal of vasectomy occurs in approximately 1 in 400 vasectomized men.⁴⁰ Some would warn that this may indicate failure of counseling.

Damage to other scrotal structures may occur rarely.

Postoperative psychosexual problems are reported. Numerous studies demonstrate 92 to 99 percent of patients are satisfied with the procedure and would recommend it to a friend. Increased sexual enjoyment is frequently reported following vasectomy. Rare cases of impotence and depression have responded to psychiatric treatment. There is never an organic cause of impotence from vasectomy.⁴¹⁻⁴⁴

Summary

Vasectomy is a procedure for male sterilization that is regularly performed by many family physicians. It is an inexpensive and simple procedure in the family practice outpatient setting and is a safe and dependable contraceptive procedure. Controversy exists in the area of techniques. Pressures of population growth and political, religious, and sociological ideals influence the practice. Instruction in the technique of counseling and procedure of vasectomy should be available in family practice residency programs.

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