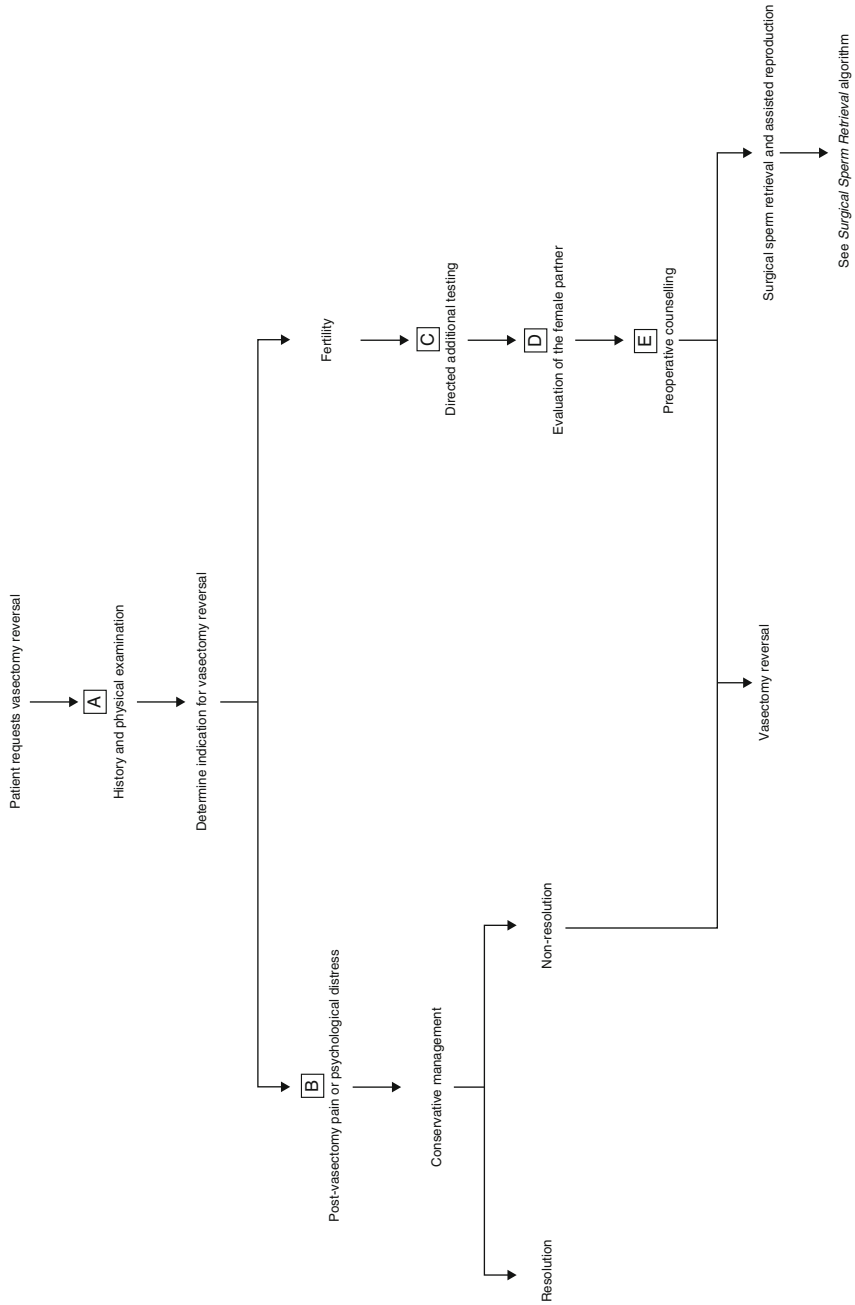
Chapter 25
Vasectomy Reversal



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Half a million men undergo vasectomy annually in the United States. Studies suggest that up to 6 % of such men will request vasectomy reversal. Divorce with remarriage is by far the most common reason for vasectomy reversal. Other reasons include a simple change in desire to have more children and death of a child. Unlike surgical sperm retrieval with assisted reproduction (which is the alternative treatment for patients who desire children after vasectomy), vasectomy reversal allows for natural reproduction, does not require hormonal manipulation of the female partner, and allows couples to have multiple children without additional treatment. This is the preferred strategy when the vasectomy is fewer than 15 years old and the female partner has normal fertility. Vasectomy reversal is among the most technically challenging surgical procedures in urology and should be performed using microscopic magnification. Outcomes depend largely upon the type of reconstruction (vasovasostomy (VV) vs. vasoepididymostomy (VE)) required and the technical expertise of the reconstructive microsurgeon. VE may be required in cases of secondary epididymal obstruction, which occurs when increased pressure in the epididymis after vasectomy causes rupture and subsequent scarring of the single epididymal tubule. Sperm return to the ejaculate after 70–99 % of vasectomy reversals, allowing for unassisted pregnancy in 30–80 % of couples. Outcomes of VV are far better than outcomes of VE due to the increased technical difficulty of VE and bypass of part of the epididymis during sperm transit after VE, where sperm gain much of their functional capacity.

(A)

The history and physical examination should focus first on identifying the indication for vasectomy reversal. Although most patients want to restore their fertility, some seek resolution of postvasectomy pain or psychological distress. For patients interested in fertility restoration, it is critical to assess the patient's reproductive potential so as to avoid reversing a vasectomy in a patient with inadequate sperm production. Important points in the history and physical examination are listed and explained in Tables 25.1 and 25.2.

(B)

Chronic scrotal pain that negatively impacts quality of life is referred to as postvasectomy pain syndrome and occurs in 1–2 % of men after vasectomy. First-line management includes scrotal support and noninvasive measures. Options include including antibiotics, nonsteroidal anti-inflammatory agents, tricyclic antidepressants, and neuromodulators such as gabapentin. Some authorities advocate the use of spermatic cord blocks with local anesthesia to confirm that the pain is organic and due to intra-scrotal pathology. If medical management fails, some experts advocate infiltration of the spermatic cord with or without steroids, which can be repeated at regular intervals if successful. Vasectomy reversal is another effective option and should be considered in patients who fail conservative management. Pain improves or resolves in 50–90 % of patients after microsurgical reconstruction.

(C)

Additional testing should be considered in patients prior to vasectomy reversal performed for restoration of fertility. Such testing is particularly important when there is concern about sperm production. Measurement of the serum follicle stimulating hormone (FSH) level is helpful in patients without any

prior history of unassisted biological paternity and those with small or soft testes on physical examination. An elevated FSH (>8 IU/L) is worrisome for impaired spermatogenesis and should prompt consideration of diagnostic testicular biopsy prior to reconstructive microsurgery. Semen analysis may also be helpful and is advocated by some experts for all patients prior to vasectomy reversal. The goals of semen analysis are to confirm the absence of motile sperm from the ejaculate and to identify rare nonmotile sperm (RNMS—present in 10 % of patients postvasectomy). The finding of any motile sperm should prompt consideration of assisted reproduction using ejaculated sperm in lieu of vasectomy reversal. The finding of RNMS is associated with a high likelihood of need for VV (as opposed to VE) and a favorable prognosis.

(D)

Evaluation of the female partner's reproductive potential is recommended prior to vasectomy reversal. This may easily be performed by eliciting a reproductive history from the female partner and by measuring her ovarian reserve with an appropriate serum biomarker. The two most widely used such tests are the FSH level on day 3 of the menstrual cycle and anti-Mullerian hormone (AMH) level. Formal evaluation by a reproductive endocrinologist should be performed when the female partner has known sub-fertility, is greater than 35 years old, has risk factors for infertility, or has laboratory evidence of diminished ovarian reserve (day 3 FSH > 10 IU/L or AMH < 0.7 ng/mL).

(E)

All patients considering vasectomy reversal for fertility restoration should be counseled about surgical sperm retrieval with assisted reproduction, which is the alternative treatment. Factors to be considered are the time interval since vasectomy, the number of desired children, the fertility status of the female partner, and the costs of each option, which vary from couple to couple based on insurance coverage and provider-specific charges for vasectomy reversal and assisted reproduction. Vasectomy reversal is generally favored when the interval since vasectomy is less than 15 years and the female partner has normal fertility. Patients electing to proceed with vasectomy reversal should be counseled about the anticipated outcomes and complications of surgery. For VV, patients may be counseled that sperm return to the ejaculate in 75–99 % of cases, allowing for a pregnancy rate of approximately 50 %. For VE, the chance of sperm returning to the ejaculate is 80 % in the hands of an experienced microsurgeon, and pregnancy may be achieved in over 30 % of cases. It is also prudent to discuss simultaneous cryopreservation of vasal or epididymal sperm at the time of reconstruction, which is particularly important if bilateral VE is required. The complications of vasectomy reversal include infection, scrotal hematoma, scrotal edema, chronic scrotal pain, and, rarely, testicular atrophy. Each should be specifically discussed when obtaining informed consent for surgery.

(F)

Intraoperative decision-making is critical during vasectomy reversal. Each operation should begin with scrotal exploration to identify the vasectomy sites. Intraoperative macroscopic and microscopic assessment of fluid retrieved from the testicular end of the transected vas deferens (on the testicular side of the vasectomy) determines whether VV or VE should be performed. If no fluid is initially

seen upon vasal transection, the testicular end of the vas may be barbotaged with saline by catheterization of the vasal lumen with a 24-gauge angiocatheter. Fluid is collected and placed on a slide for examination with a benchtop light microscopic, which should be present in the operating room. VV is indicated when any sperm or sperm parts are present in the fluid, and also when copious crystal clear watery fluid without sperm is present. VE should be performed when sperm are absent from the intravasal fluid, which is characteristically thick and white but may vary in macroscopic appearance. It is prudent to assess distal vasal patency prior to each anastomosis by injection of saline into the abdominal end of the vas with a 24-gauge angiocatheter, which should inject easily without back pressure.

(G)

Simultaneous cryopreservation of sperm retrieved from the vas deferens or epididymis should be considered for all patients undergoing vasectomy reversal. This approach provides a safety net for the patient in the event of surgical failure. Sperm cryopreservation is generally not necessary if at least one VV is performed by an experienced microsurgeon because failure is exceedingly rare. Sperm cryopreservation is best discussed preoperatively.

(H)

Immediate postoperative care should include preventive measures to minimize the likelihood of complications. Ice packs and compression should be applied to the scrotum for 72 h after surgery to decrease scrotal bleeding and edema. Strenuous physical activity should be avoided for several weeks, and the patient should be instructed to abstain from ejaculation for 4 weeks to minimize stress on the anastomoses. The schedule for follow-up semen analyses varies according to surgeon preference. Semen analyses should generally be obtained every 3–6 months until the sperm count plateaus, pregnancy is achieved, or the patient remains persistently azoospermic for 12–18 months. Most patients in whom VV is successful experience return of sperm to the ejaculate within 6 months. Sperm in the ejaculate my take up to 12 months following VE. Some experts advocate elective sperm cryopreservation once sperm return to the ejaculate because there is a risk of secondary azoospermia due to late anastomotic shutdown, which occurs in approximately 10 % of patients overall (and is especially likely after VE).

Table 25.1 Important points to elicit in the medical history

Medical history	Interpretation
Prior fertility history	Prior unassisted biological paternity suggests normal sperm production
Time interval since vasectomy	Short intervals (<5 years) are associated with decreased need for vasoepididymostomy
General medical and surgical history, including medications	Important in all pre-surgical patients

Table 25.2 Important points to elicit when performing physical examination

Physical examination	Interpretation
Testicular size	Small soft testes are associated with impaired sperm production
Epididymal irregularity or induration	May be associated with need for vasoepididymostomy
Gap between cut ends of vasa	Predicts need for vasal mobilization during surgery, which affects choice of surgical incision
Sperm granuloma	Associated with decreased need for ipsilateral vasoepididymostomy

Suggested Reading

Belker AM, Thomas AJ, Fuchs EF, Konnak JW, Sharlip ID. Results of 1,469 microsurgical vasectomy reversals by the Vasovasostomy Study Group. J Urol. 1991;145(3):505–11.

Brannigan RE. Vasectomy reversal: indications and outcomes. J Urol. 2012;187(2):385–6.

Goldstein M, Tanrikut C. Microsurgical management of male infertility. Nat Clin Pract Urol. 2006;3(7):381–91.

Hsiao W, Goldstein M, Rosoff JS, et al. Nomograms to predict patency after microsurgical vasectomy reversal. J Urol. 2012;187(2):607–12.

Jarow JP, Sigman M, Buch JP, Oates RD. Delayed appearance of sperm after end-to-side vasoepididymostomy. J Urol. 1995;153(4):1156–8.

Jarow JP, Oates RD, Buch JP, Shaban SF, Sigman M. Effect of level of anastomosis and quality of intraepididymal sperm on the outcome of end-to-side epididymovasostomy. Urology. 1997;49(4):590–5.

Pierpaoli S, Mulhall JP. Vasectomy reversal in the age of intracytoplasmic sperm injection. Curr Opin Urol. 1998;8(6):531–4.

Practice Committee of American Society for Reproductive Medicine. Vasectomy reversal. Fertil Steril. 2008;90(5 Suppl):S78–82.

Shridharani A, Sandlow JI. Vasectomy reversal versus IVF with sperm retrieval: which is better? Curr Opin Urol. 2010;20(6):503–9.