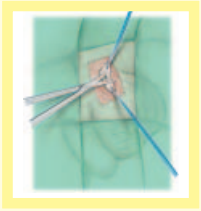
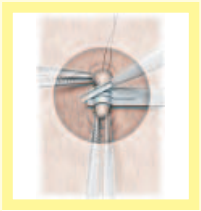
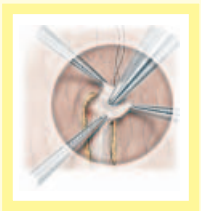
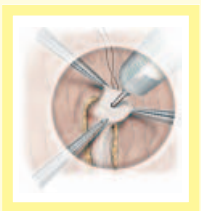
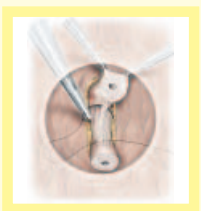
Surgery Illustrated











Surgical Atlas

Vasovasostomy

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ILLUSTRATIONS by STEPHAN SPITZER, www.spitzer-illustration.com

PLANNING AND PREPARATION

INDICATIONS

Vasectomy is a safe and effective form of birth control chosen worldwide by ≈15% of all couples seeking advice for contraception [1]. However, changing circumstances, e.g. remarriage, the death of children, or a change of heart, have led 2–9% of men to request a vasectomy reversal [2–4], the most common indication for reconstructive microsurgery. Other indications for vasovasostomy include less common causes of vasal obstruction secondary to infection such as gonorrhoea or tuberculosis, or to iatrogenic vasal injury related to groin or scrotal surgery.

PATIENT SELECTION

Overview

The choice of vasovasostomy depends on the nature and extent of the obstruction, the quality of the opposite testis and the quality of the intravasal fluid. However, the microsurgeon must always be prepared to perform a more complicated vasoepididymostomy if intraoperative findings dictate this situation.

Assessment before surgery

Increasing intervals of obstruction have been shown to have an adverse impact on the success of microsurgical reconstruction. In 1991, the Vasovasostomy Study Group [5] showed a direct relationship between successful pregnancy rates and time since vasectomy, with the pregnancy rates being 76% after <3 years, 53% after 3–8 years, 44% after 9–14 years, and 30% after >15 years. Patients are counselled about realistic expectations for success, given these predictive variables. Furthermore, sperm cryopreservation should be offered to all patients at the time of reconstruction.

Laboratory evaluations such as serum FSH or antisperm antibody testing is helpful but not necessary before reconstruction.

INTRAOPERATIVE CONSIDERATIONS

Intravasal fluid assessment

The quality of the intravasal fluid has a direct impact on the surgeon's choice of microsurgical reconstruction technique. In general, if there is fluid containing sperm or sperm parts then a vasovasostomy should be done. If clear or copious fluid is encountered with no sperm, in a patient having a first vasovasostomy, then vasovasostomy may also be performed. If there is no fluid, or thick, inspissated, toothpaste-like fluid is encountered, a vasovasostomy will probably not be successful and one should proceed to a vasoepididymostomy.

Sperm granuloma

The presence of a sperm granuloma often indicates a release of fluid into the

surrounding tissues, which protects the epididymis from tubule rupture or dysfunction.

Sperm granulomas have been associated with better grades of sperm quality in the intraoperative vas but have not been shown to be associated with better postoperative results [5]. The choice of microsurgical technique should not depend upon this factor alone.

SPECIFIC EQUIPMENT/MATERIALS:

- Operating microscope: Zeiss ZMS-414 model;
- Standard microscope for checking testicular fluid;
- On-line monitor and camera;
- 3.3 Bishop Harmon forceps;
- McPherson tying forceps;
- 0.12 Castroviejo suturing forceps;
- Jacobson mosquito forceps;
- #3 Jeweller forceps;
- #5 Jeweller forceps;
- Curved Castroviejo needle holder without lock;
- 12 cm Halsey needle holder;
- Straight Iris scissors;
- Vannas pattern dissecting scissors;
- Vannas pattern suture scissors.

Extras:

- Nerve holder (1.5, 2.0, 2.5, 3.0, 3.5, 4.0);
- Nonperforating towel clamps (ball tip);
- #3 Knife handle;
- 'Dennis' blade holder.

Suture Preferences:

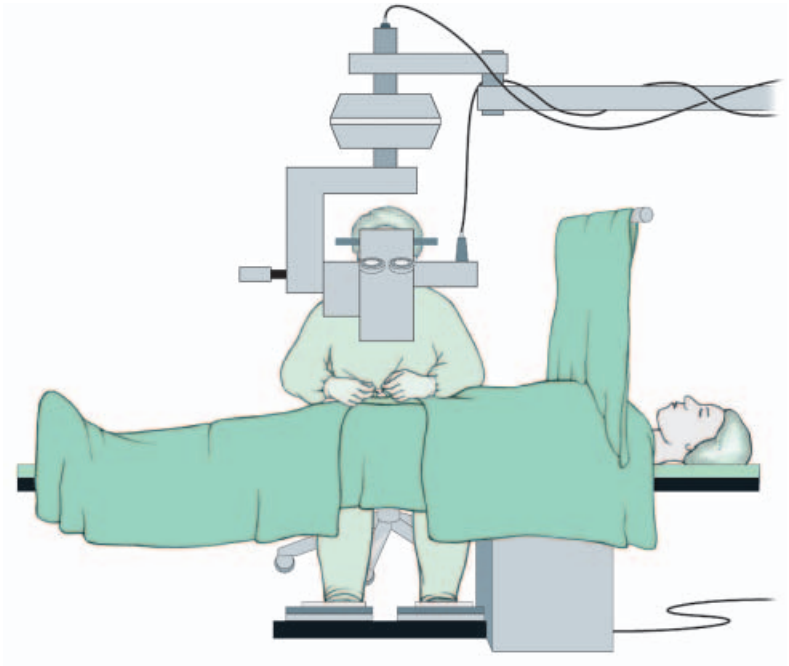
- 10–0 nylon 2XBRM5 for inner layer of vas;
- 9–0 nylon HSV6 for outer layer of vas.

SPECIFIC PATIENT POSITIONING

- Table with central support and leg extension;
- Adjustable stools;
- Waterproof drapes;
- Prep (removing all betadine).

Figure 1

After the general anaesthetic induction, the scrotal, genital and bilateral inguinal regions are shaved and prepared as for standard surgery. After draping, the operating microscope is positioned at the head of the bed on the patient's left side. The surgeon is seated on the patient's right with the microscope foot controls on the floor also on the patient's right side. The assistant sits opposite the operating surgeon on the patient's left side. Microscope and viewing monitor are placed at the head of the bed on the patient's left side in view of the operating surgeon.



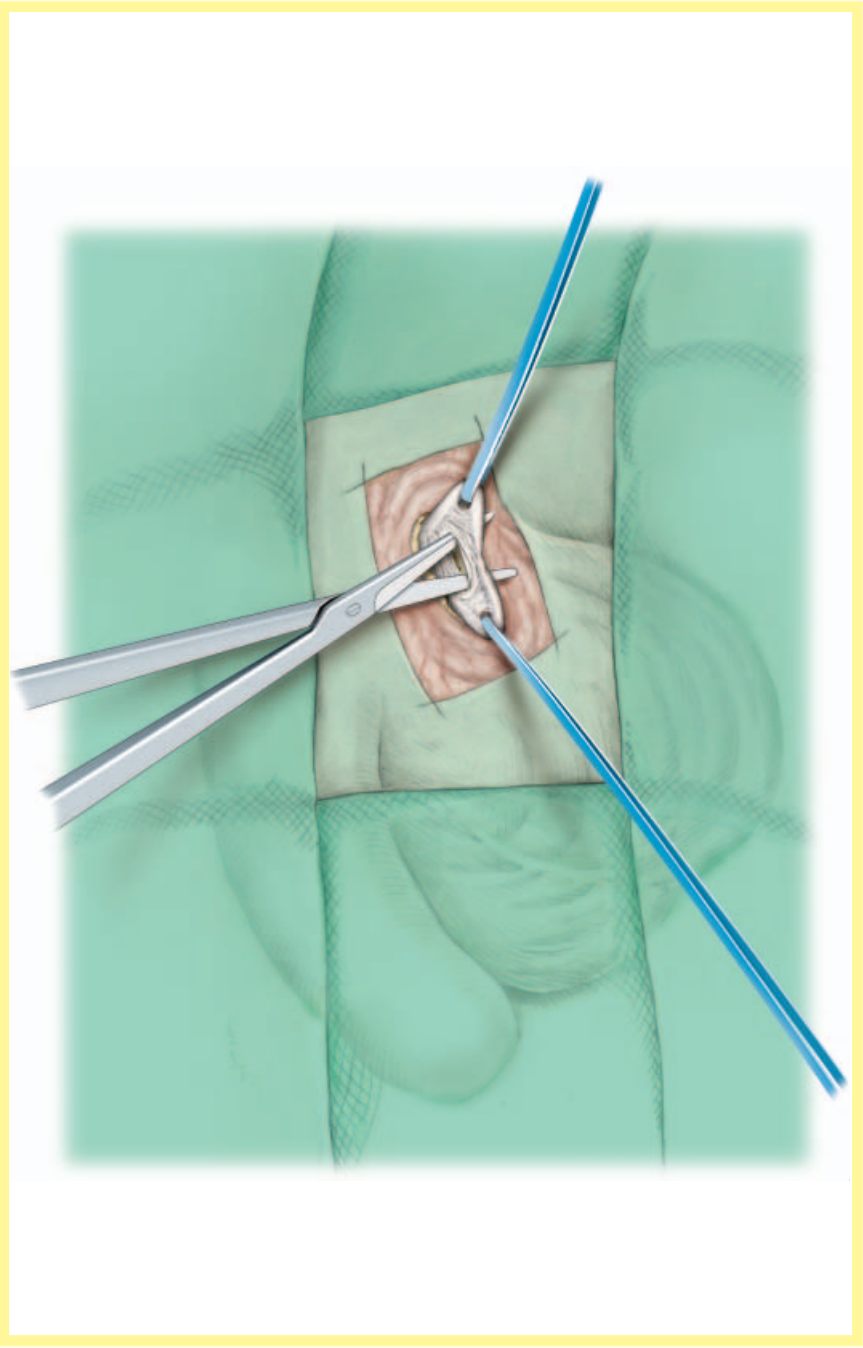
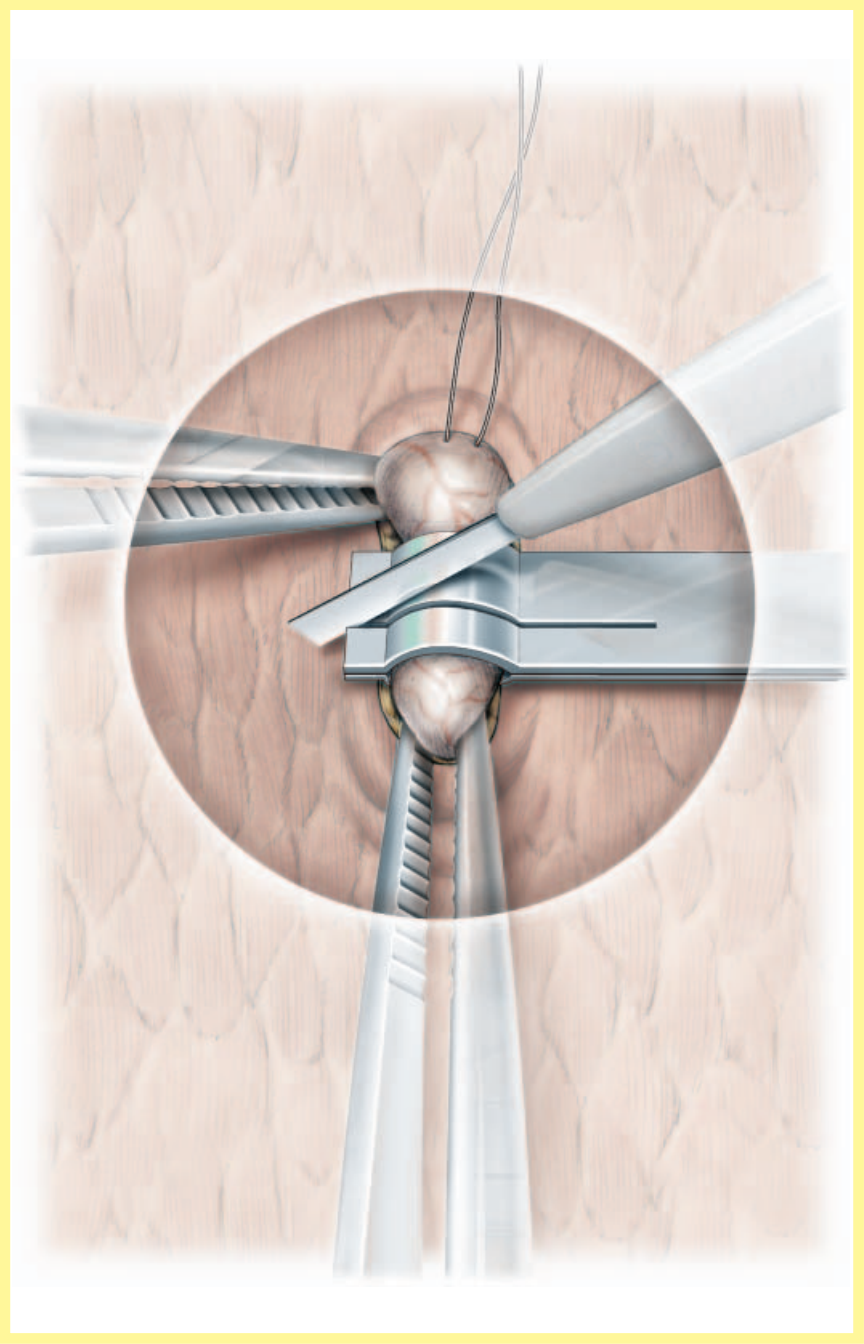


Figure 2

An incision is made in the first hemiscrotum, and the vas identified and isolated distal to the level of obstruction.

Figure 3

A 5/0 chromic suture is placed in the serosa of the testicular vas, and the vas transected using a nerve holder and 'super' blade. The upside vas is then tied off with a 3/0 chromic freehand tie. Vasal fluid is aspirated from the testicular vas and examined under × 400 magnification. The image is projected on the monitor for the operating surgeon to verify the presence of sperm parts. The vas is then identified and isolated proximal to the level of obstruction. It is transected in the same manner described above.



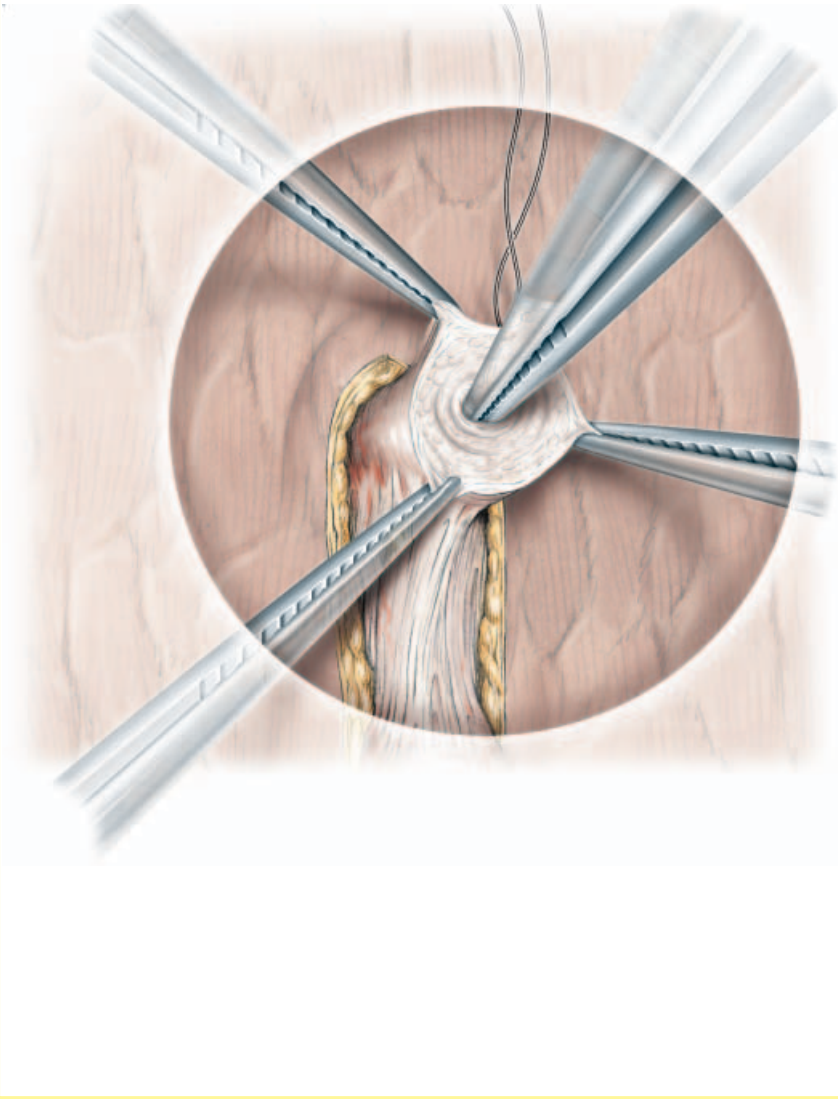
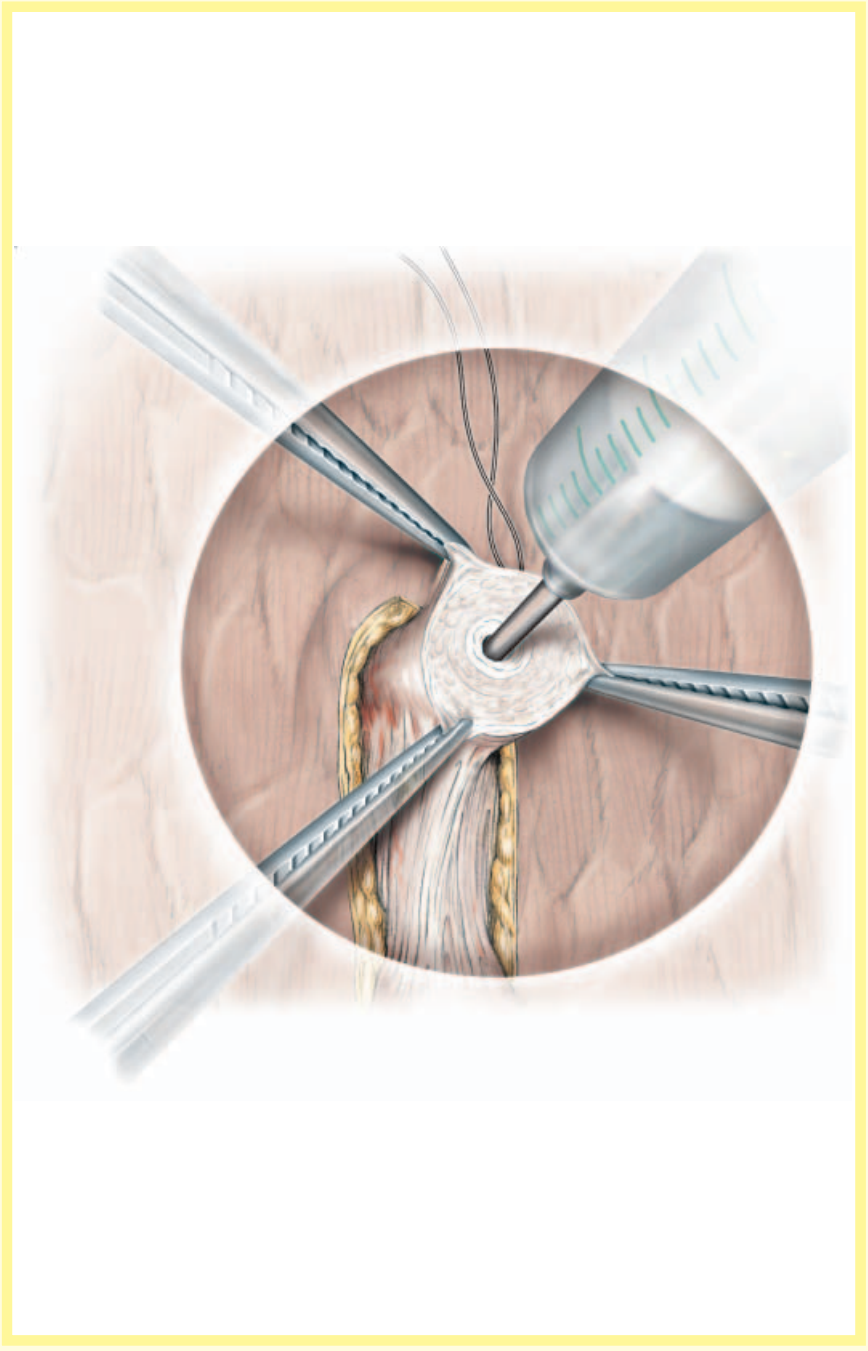


Figure 4

The abdominal vas is gently dilated with fine forceps.

Figure 5

The abdominal vas is irrigated with a 24 F angiocath to verify patency.



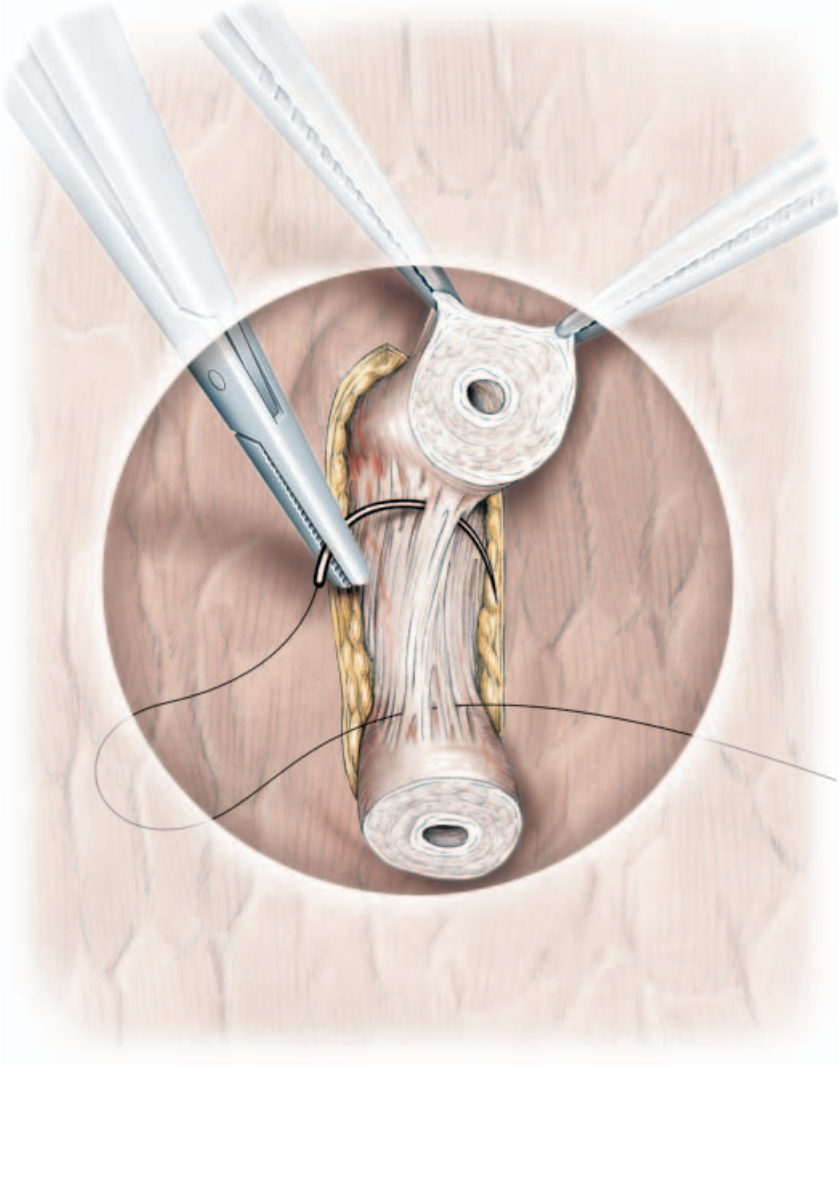


Figure 6

The testicular and abdominal vas ends are brought in close proximity with 5/0 polydioxanone in the perivasal tissue.

Figure 7

A fine-tip marking pen is used to mark the 6 o'clock position.

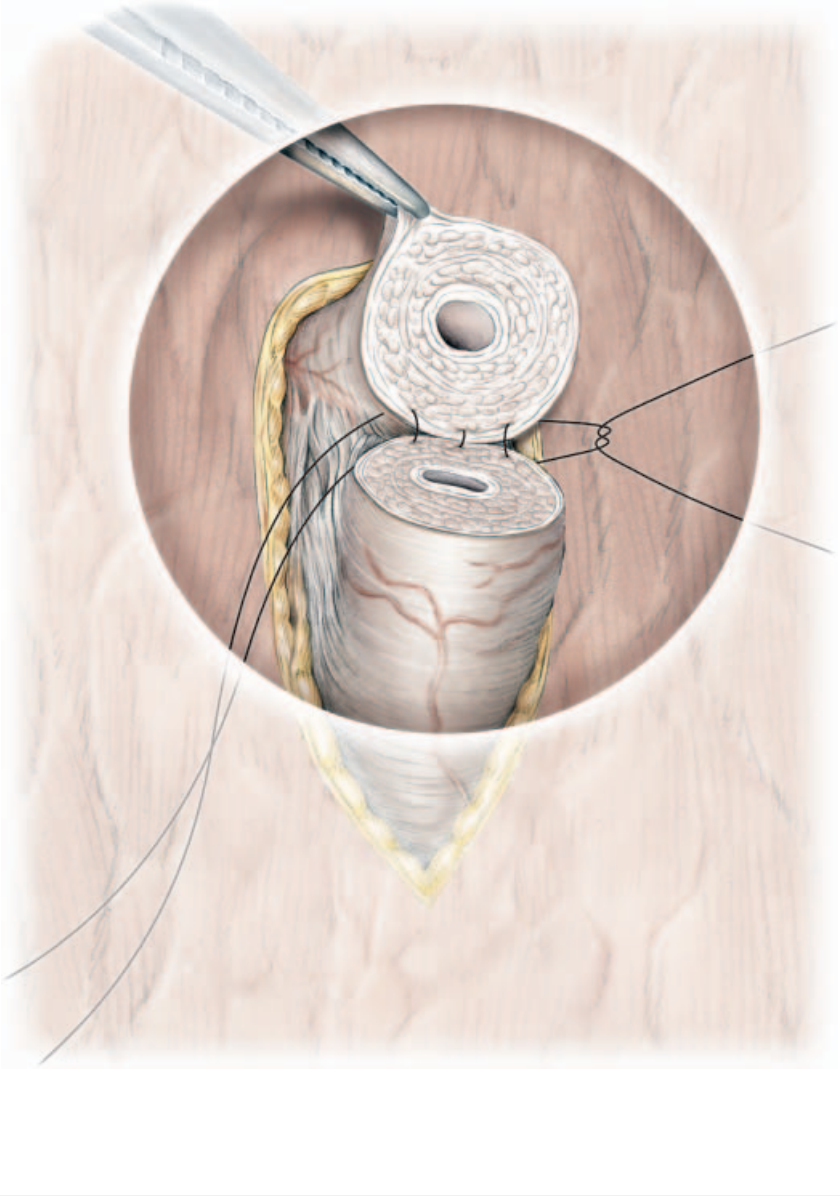
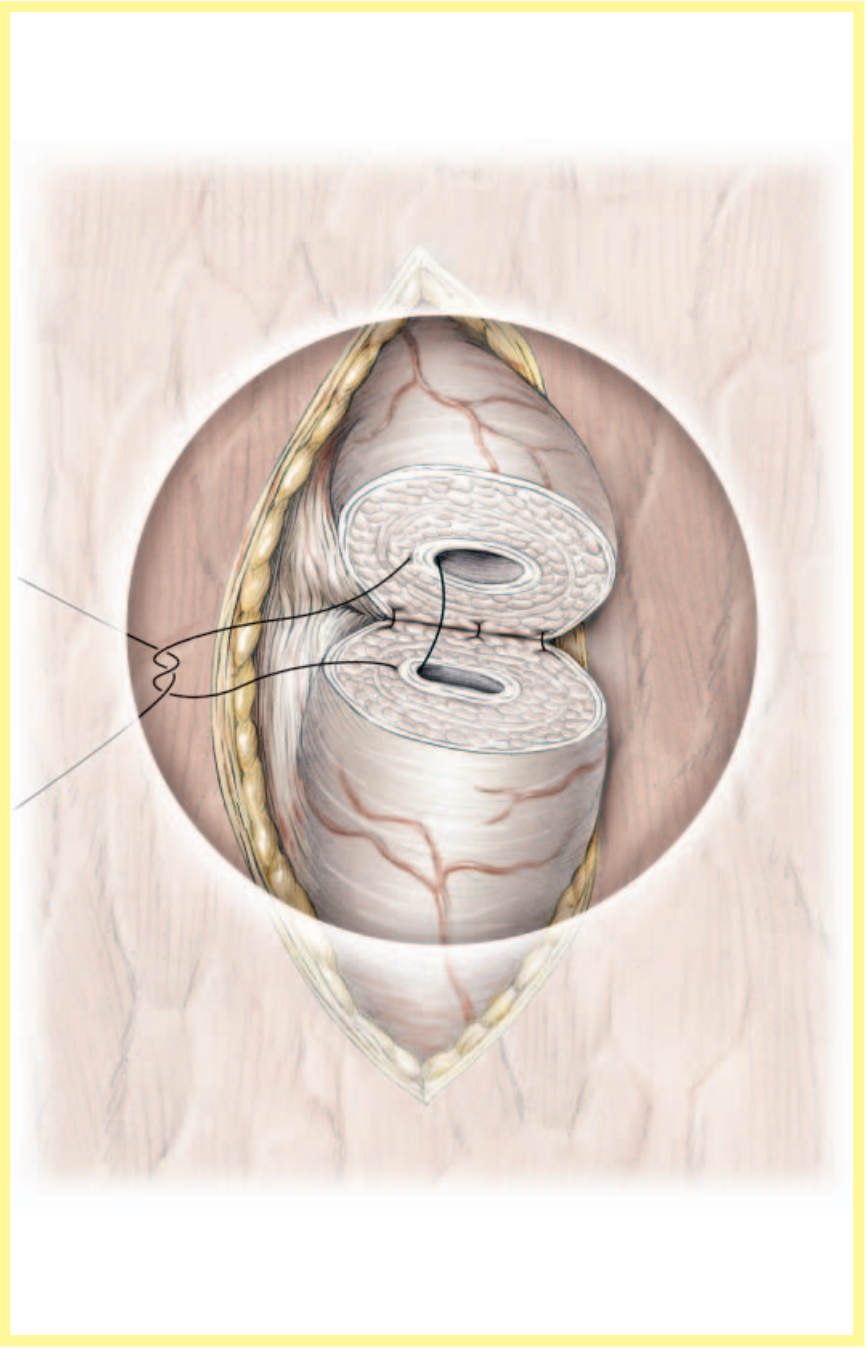


Figure 8

A 9/0 nylon suture on a HSV needle (Sharpoint) is used to re-appose the serosa layer. Sutures are placed in the serosa at the 5, 6 and 7 o'clock position.

Figure 9

10/0 nylon on 2 × BRM5 needle is used to place sutures in the vasal mucosa.



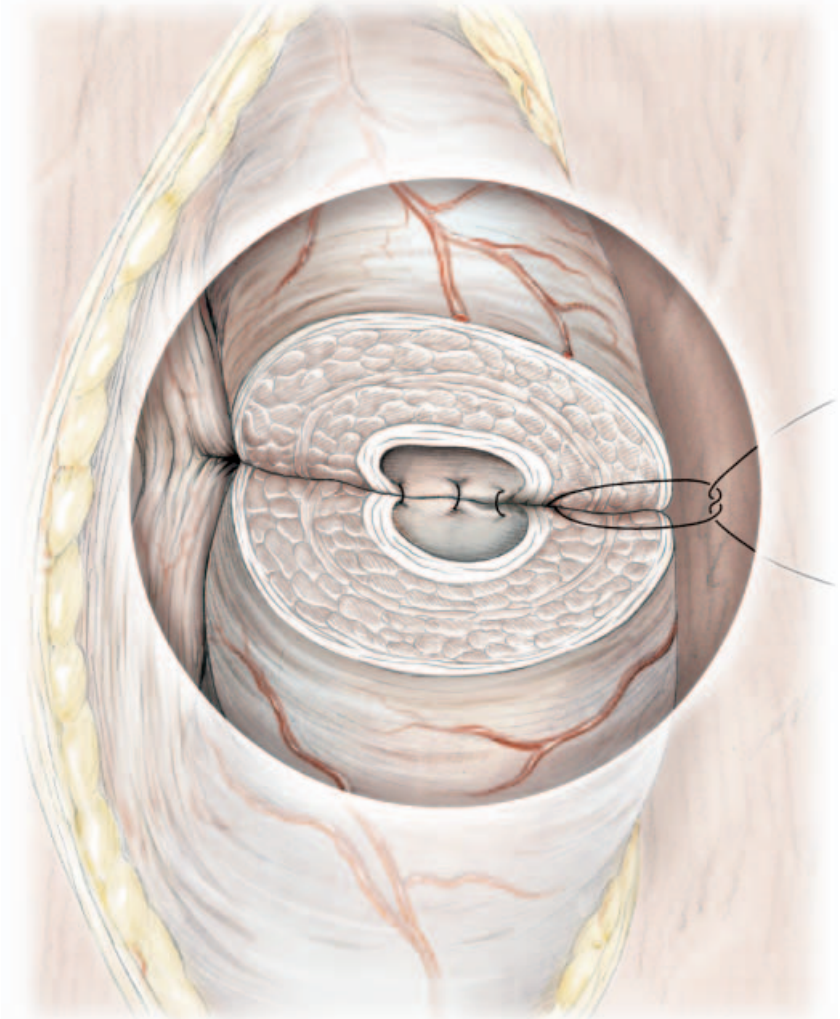
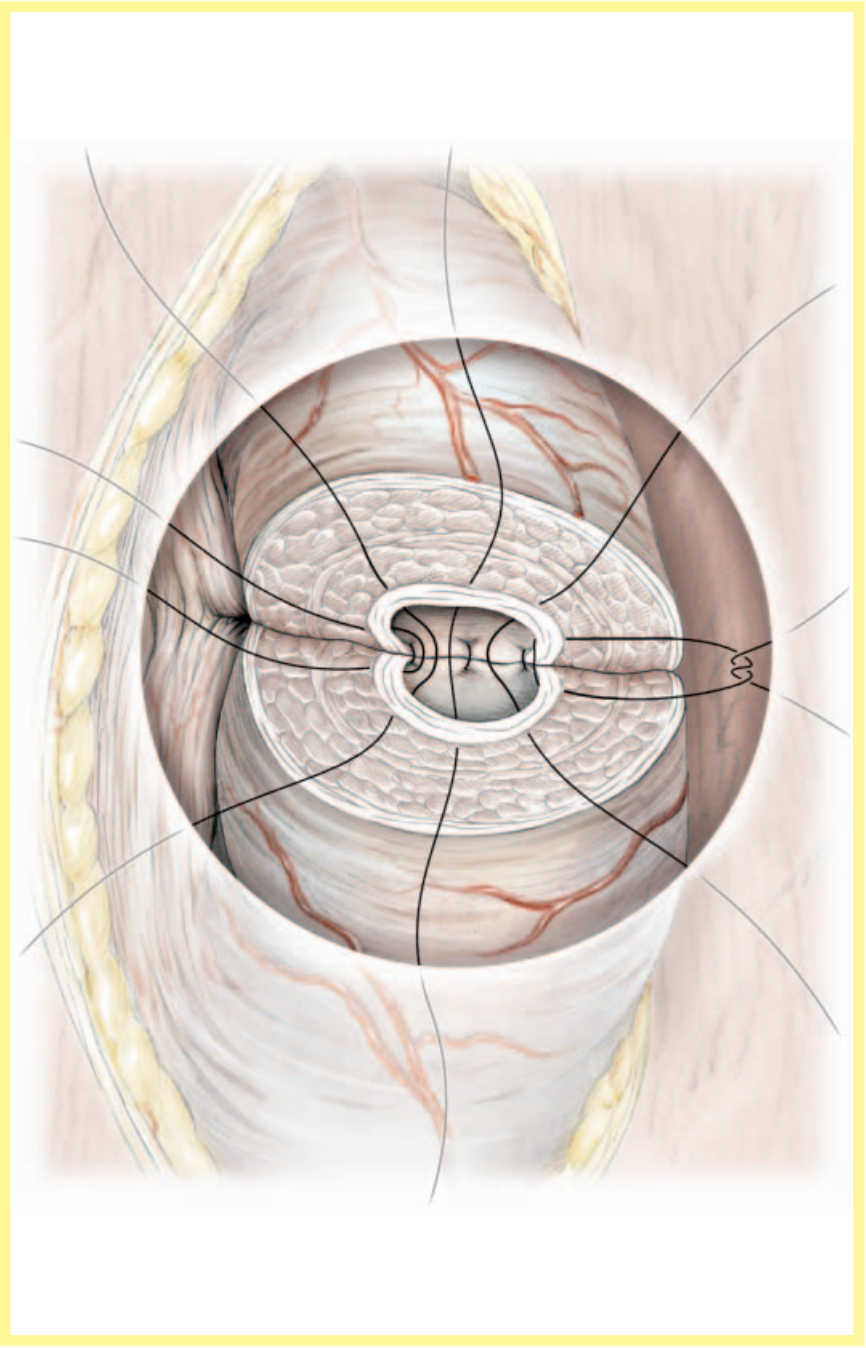


Figure 10

Sutures are placed at the 4, 6, 8 o'clock positions within the mucosa.

Figure 11

Five additional stitches are then placed at the 1, 3, 9, 11 and 12 o'clock position.



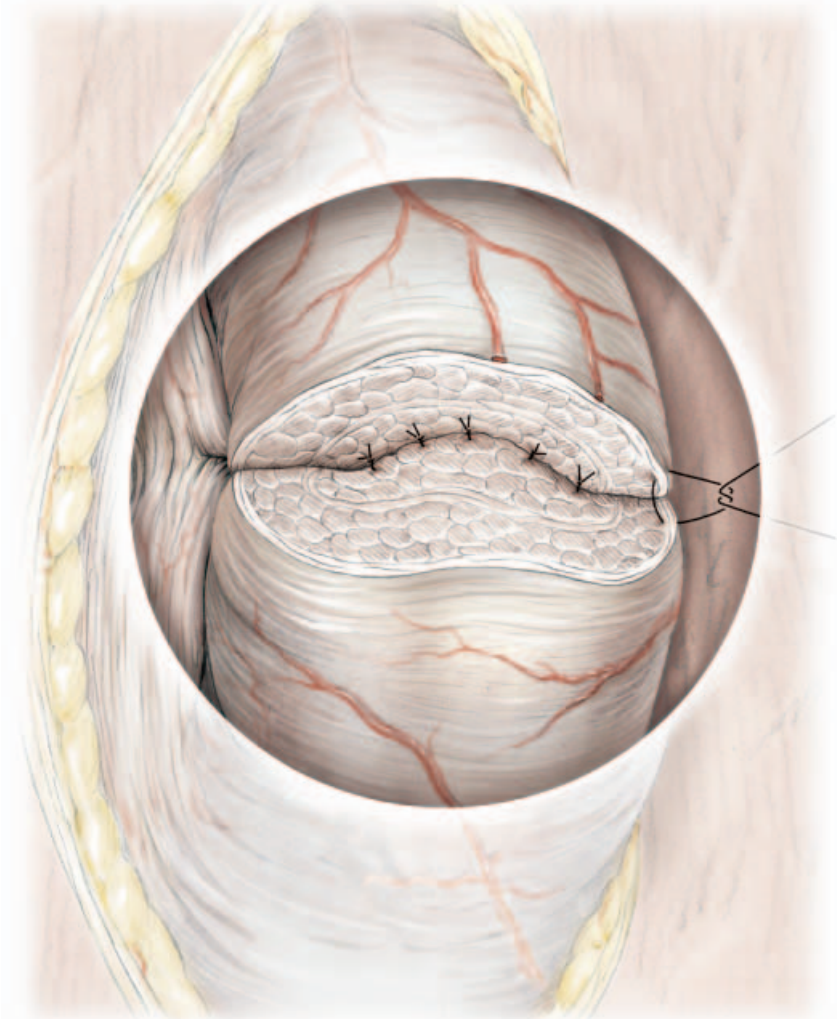
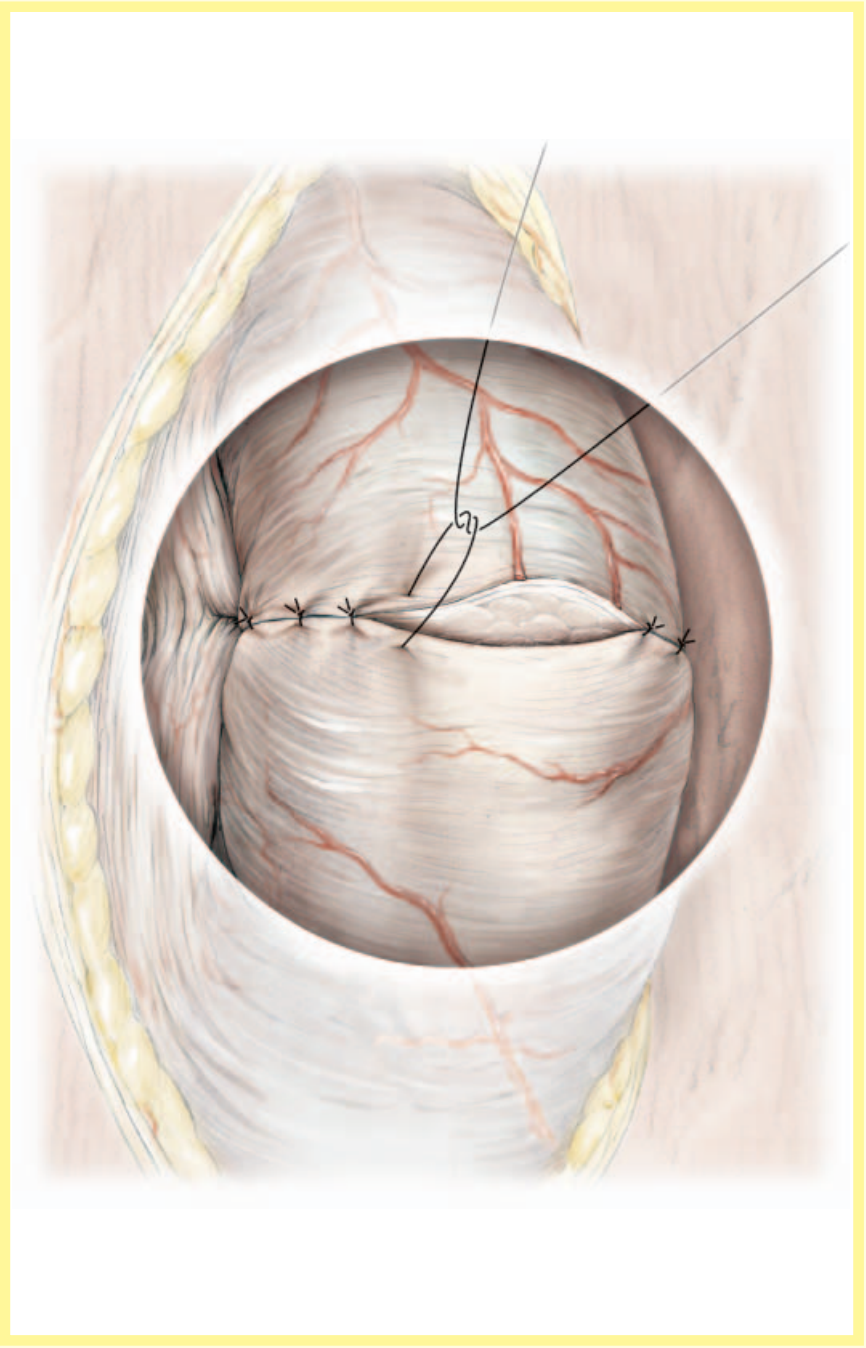


Figure 12

The mucosal sutures are then tied.

Figure 13

9/0 nylon suture is used to place sutures in the vasal serosa to complete the outer anastomosis.



POSTOPERATIVE CARE

All patients enter the recovery room with an athletic supporter filled with dressing to keep the scrotum elevated. After 24 h, all dressings from inside the athletic supporter are removed except for one or two gauze pads. A special cellophane-coated gauze (Telfa™) remains on the suture line for 48 h. The supporter should remain in place for 2 weeks or as long as it helps to avoid any discomfort. It is very important to apply ice packs to the scrotum the night after surgery and the following day to prevent haematoma formation. Pain medications and antibiotics are routinely prescribed to reduce pain and prevent infection. Physical exertion should be avoided for at least 2 weeks after surgery; patients may resume normal activity 48 h after surgery, and sexual intercourse may resume 10 days after surgery. The first semen sample is analysed 6 weeks after surgery.

FROM SURGEON TO SURGEON

POTENTIAL PROBLEMS

The most common cause of failure is stenosis or obstruction at the site of the previous vasovasostomy. The delayed closure rate of initially patent anastomoses is 3–6% per year for vasovasostomies [6]. Excellent results can be obtained by repeat vasovasostomy.

An aggressive vasectomy resulting in a long segment of vas removal may necessitate more vigorous mobilization of the vas. Consequently, there is a greater potential for devascularization, fibrosis and tension on the anastomosis. Careful preparation and dissection is recommended to minimize the higher risk for failure.

Vasectomy at a lower site, e.g. in the convoluted vas, presents a greater technical challenge for vasovasostomy. The wall of the convoluted vas is more delicate than the wall of the straight vas, and can be easily ruptured if not handled gently. Successful division of the convoluted vas requires that the tubule be straightened, because the convoluted vas not only bends backwards on itself but also rotates on its longitudinal axis. The convoluted vas can be divided by initially dissecting the larger convolutions and then carefully dividing the intravasal attachments. This technique unwinds the convoluted vas and provides a straight segment which is ideal for transection.

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