

SHOULD ALL UROLOGISTS PERFORMING VASECTOMY REVERSALS BE ABLE TO PERFORM VASOEPIDIDYMOSTOMIES IF REQUIRED?

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ABSTRACT

Purpose: While vasectomy reversal is a highly successful procedure 10% to 30% of reversals may fail. Despite the general consensus that an epididymal obstruction may occur following a vasectomy and that some men should undergo vasoepididymostomy (VE) rather than vasovasostomy (VV), the practice of many urologists in our region has been to offer only VV for vasectomy reversal. We examined the potential causes for vasectomy reversal failure in patients who had undergone VV without an attempt at VE.

Materials and Methods: We conducted a retrospective review of patients who had undergone redo vasectomy reversal from January 1999 to September 2001. A total of 22 patients underwent redo reversal with a minimum followup of 2 years. The medical records of all patients were then reviewed. Patients and partners seen postoperatively in the clinic were questioned regarding any pregnancy or deliveries.

Results: We examined 22 patients who had undergone redo vasectomy reversal. Of 22 patients 9 (40.9%) underwent repeat VV, 8 (36.3%) underwent bilateral VE for a presumed unrecognized epididymal obstruction and 5 (22.7%) had a combination of VE and VV. Of the 44 reproductive units studied 23 (52.3%) had a failed vasal anastomosis while 21 (47.7%) had an unrecognized epididymal obstruction. Based on semen analysis patency was observed in 75% of patients who had undergone vasovasostomy as a redo procedure. A patency rate of 60% was found in patients who underwent vasoepididymostomy and vasovasostomy unilaterally, and patency rates for bilateral VE were 63%.

Conclusions: Our study indicates that a large proportion of men (48%) have an epididymal obstruction as the etiology for vasectomy reversal failure. We recommend that all surgeons offering vasectomy reversals be able to offer VE if required based on intraoperative findings to serve the patient adequately as well as his partner and their future fertility.

KEY WORDS: vasectomy, infertility, vasovasostomy

In the United States almost half a million men undergo vasectomy each year. Approximately 2% to 6% of these men will request a vasectomy reversal.¹ While vasectomy reversal is a highly successful procedure, the potential for technical failure as well as an unrecognized epididymal obstruction exists and may account for the approximately 10% to 30% of reversals that fail.^{2–6} Large series of primary vasectomy reversals by experienced surgeons demonstrate a patency rate of 84% to 90% and a pregnancy rate of 48% to 63%.^{3–6} The largest study of vasectomy reversals conducted by the Vasovasostomy Study Group demonstrated that the success of vasovasostomy (VV) varied depending on the presence of sperm and the consistency of the vasal fluid. If sperm is present in the fluid from the vas deferens patency rates are reported to be as high as 90% to 98%.³ With "vasospermia" bilaterally, patency rates were 80% for watery fluid, 75% for opalescent fluid and 26% for creamy fluid.³ Other large series of vasovasostomy for primary repair demonstrated a patency rate of 84% to 90% and a pregnancy rate of 48% to 63%.^{3–6}

These findings make it clear that a successful VV depends on factors beyond the technical success of the operation. Proximal (ie testicular) to the vasectomy there is often distension of the epididymis which may result in epididymal fluid extravasation and epididymal obstruction.² Some authors estimate that approximately 30% of failed vasectomy reversals could be attributed to an unrecognized epididymal obstruction.² Clearly many of the men with vasospermia

have an epididymal obstruction which would be best treated with vasoepididymostomy (VE). The literature has shown that primary VE repair can be highly effective with patency rates as high as 85%.⁷ It has also been established that the rate of vasospermia increases with the length of time from vasectomy.²

While there is general agreement that an epididymal obstruction may occur in men following a vasectomy, the described indications to proceed with VE for a primary vasectomy reversal have varied among researchers. Some authors advise that VE be performed in the absence of sperm in the vasal fluid.⁸ Conversely, others suggest that a VV be performed regardless of whether sperm is detected in the intravasal fluid.⁹ Others have suggested that a VE be considered in men with vasospermia and nonwatery vasal fluid.^{3,7} Some researchers have also described proceeding with VE only if the surgeon was experienced with microsurgery.³ The patency rate of primary VV in men with vasospermia was found to be poor (46%) and was not influenced by the obstructive interval.¹⁰

Regardless of the controversy regarding when VE is indicated in vasectomy reversal, the general literature does suggest that some men will require VE for their repair. Despite the general consensus that an epididymal obstruction may occur following a vasectomy and that some men should undergo VE rather than VV, based on our patient referral experience the practice of many urologists in our region has been to offer only VV for vasectomy reversal.

To our knowledge no study has examined whether patients who have had an unsuccessful vasovasostomy would have

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benefited from vasoepididymostomy at initial repair. To address this question we examined the potential causes for vasectomy reversal failure in patients who had undergone vasovasostomy without an attempt at vasoepididymostomy.

METHODS

We conducted a retrospective review of patients who had undergone redo vasectomy reversal from January 1999 to September 2001. A total of 22 patients underwent redo reversal with a minimum followup of 2 years. The date of vasectomy, date of first vasectomy reversal, history of conception with current partner, history of female factor infertility problems and smoking history were all documented. Patients were seen after surgery with semen analyses every 3 months for a minimum of 2 years after surgery. Patency was defined as the presence of sperm in the ejaculate. Patients and partners seen postoperatively in the clinic were questioned regarding any pregnancy or deliveries. All additional information was obtained by telephone interview to complete the database.

At surgery scrotal exploration was conducted, and the vas was incised above and below the site of previous vasectomy reversal. Fluid on the testicular end of the vas was aspirated and examined microscopically for the presence of sperm. If sperm was present we proceeded with vasovasostomy. If no sperm was found the end of the vas was irrigated with normal saline solution and aspirated again to examine further for the presence of sperm.² After this careful examination if no sperm was found we considered the epididymis to be obstructed and proceeded with VE. The epididymis was incised and tubules were opened more proximally until sperm was identified, and a vasoepididymostomy was performed. This algorithm for the management of vasospermia was the same decision process used when managing primary vasectomy reversals.

Vasovasostomy was performed with a modified 4-layer technique with 1 layer incorporating the mucosa and 2/3 seromuscularis, then the remaining seromuscular layer, a superficial layer incorporating the serosa and then finally an adventitial layer. Vasoepididymostomy was performed using a standard end-to-side longitudinal intussusception technique as described in the literature.^{2, 11, 12}

RESULTS

We examined 22 patients (44 reproductive units) who had undergone redo vasectomy reversal. Of the 22, 9 (40.9%) underwent repeat VV and 8 (36.3%) underwent bilateral VE for a presumed unrecognized epididymal obstruction while 5 (22.7%) had a combination of VE and VV. Mean patient age and testicular size did not vary significantly among the VV, VV/VE and bilateral VE groups. There was no significant difference in mean age, physical findings, duration from vasectomy to primary vasectomy reversal (11.7 versus 11.4 years) or time to redo vasectomy reversal in men undergoing either VV, VE/VV or VE alone (3.4 versus 2.6 years). Interestingly, even some men with a short interval between vasectomy and vasectomy reversal (as short as 2 years) had epididymal obstruction.

A vasal obstruction at the site of the primary VV was found in 23 of 44 (52.3%) reproductive units. Unrecognized epididymal obstruction was the basis of failure of the primary repair in 21 of 44 (47.7%) reproductive units examined. Of 22 patients 5 (22.7%) had a combination of unrecognized epididymal obstruction on 1 side and failed vasal anastomosis on the contralateral side.

Based on semen analyses completed 3, 6 and 12 months after surgery, patency was observed in 75% of patients who had undergone vasovasostomy as a redo procedure (see table). These patients had a mean sperm count of $27.1 \times$

Surgery performed and patency rates

Procedure	No. Pts/Total No. (%)	No. Patent (of those submitting semen analysis)/ Total No. (%)
Bilat VV	9/22 (41)	6/8 (75)
Bilat VE	8/22 (36)	5/8 (62.5)
VV + VE	5/22 (23)	3/5 (60)

$10^6/\text{ml} \pm 8.2 \times 10^6$. A patency rate of 60% was found in patients undergoing unilateral vasoepididymostomy and unilateral vasovasostomy as part of repair, and the patency rate for bilateral VE was 63%. Mean sperm count for unilateral vasoepididymostomy and bilateral vasoepididymostomy cases was $24.2 \times 10^6/\text{ml} \pm 12.6 \times 10^6$ and $29.8 \times 10^6/\text{ml} \pm 22.1 \times 10^6$, respectively.

DISCUSSION

Although vasectomy should be considered a permanent form of contraception, a man may subsequently consider reestablishing his fertility. Vasectomy reversal operations can be technically demanding, requiring significant microsurgical expertise.

Several large series have demonstrated a success rate for primary reversal between 84% and 90% with a pregnancy rate of 48% to 63%.^{3-6, 8, 9} Several factors which may influence the success of a VV have been described. A longer duration of obstructive interval has been shown to be associated with a lower success rate.^{1, 2} The absence of sperm in the vas deferens during VV has also been shown to be a negative prognostic indicator for VV success and is often used as an indication to proceed with VE.^{1, 2} Matthews et al demonstrated that complete treatment failures following vasectomy reversals were due to unrecognized epididymal obstruction in 74% of their patients.¹³ Similarly Hernandez and Sabanegh found that 73% of their patients required VE on at least 1 side after initial vasectomy reversal.⁸

In our series we found that failure was secondary to epididymal obstruction in 47.7% and failed anastomosis in 52.3%. To our knowledge this series is the largest studying the causes of vas reversal failure. How confident are we that the initial cause of the failure was epididymal obstruction? It is possible that in some cases the epididymis was open and the sperm was simply not present in the vas deferens at the site of the original vasectomy (due to loss or breakdown of sperm in transit). However, this scenario is unlikely because in all cases there was no sperm in the ejaculate after the initial repair and the epididymis appeared abnormally distended. All of these factors would tend to indicate a secondary epididymal obstruction as the cause of VV failure.

We cannot say with certainty that an epididymal obstruction did not develop in the ensuing 2.5 years since the first operation. However, in reports of men undergoing VV less than 3 years after vasectomy, the patency rates are high and the incidence of vasospermia is low.³ This and other studies would indicate that this epididymal obstruction is of longer duration. Epididymal obstruction may develop in some men 2.5 years after primary repair but we do not think this would be a significant proportion of the total population.

It is not the general practice in our community for urologists to offer VE as an option for a man undergoing vasectomy reversal. VV is performed as the initial repair and then patients are referred to more specialized centers in the event of failure. In our study we have shown that up to 48% of these cases of failure may have benefited from VE for vasospermia, which may have been conducted at the initial surgery. Previous studies have reported patency rates for vasectomy reversals to be 84% to 96% for vasovasostomy repairs and up to 85% for vasoepididymostomy repairs.^{7, 11}

REFERENCES

- How many of these men with a failed VV could have avoided a second operation if a VE had been performed at the initial repair? In our patient group undergoing redo vasectomy reversal, assuming a patency of 85% on initial VE repair, 40% could have avoided a second operation if VE had been performed for vasospermia at the initial repair.¹³⁻¹⁶ This delay or repeat surgery may result in an eventual decrease in patency rate even if a second surgery is performed. The patency rate for a primary VE repair for vasectomy reversal ranges from 50% to 85% with a pregnancy rate of 17% to 44%.^{3,12} For redo vasectomy reversals which require a bilateral VE the reported patency rates are lower (40.7% to 69%) and pregnancy rates range from 14.8% to 40%.^{9,10,17} Our study demonstrates a 63% patency rate for men undergoing VE (unilateral and bilateral) as a redo VV procedure. In comparison our institutional patency rate for a VE performed for a primary vas reversal is 83%, which compares well to the literature (unpublished observation).
- In addition to a second operation and a possibly decreased patency rate with redo reversals, the waiting time needed for 2 surgeries rather than 1 will decrease fertility rates. The additional 1 to 3 years of waiting inherent in the redo vasectomy reversal process may have a significant impact on the female partner's fertility rates. It has been demonstrated that pregnancy rates decrease after age 30 years.^{18,19} As the female partner ages and fertility decreases, the need for assisted reproductive technologies may increase. Kolettis and Thomas et al have shown that VE is a more cost-effective and successful procedure than the combination of sperm aspiration and intracytoplasmic sperm injection.²⁰
- The most likely reason that VE is not offered at VV is lack of exposure and inexperience with the procedure. All of our patients underwent the primary vasovasostomy elsewhere and were then referred to our center for further care. We cannot say with certainty whether this practice is typical throughout North America but it is an issue we plan to investigate.

CONCLUSIONS

Our study indicates that up to 48% of men have a primary epididymal obstruction as the etiology for vasectomy reversal failure. While previous reports have shown that the frequency of epididymal obstruction increases with the length of time after vasectomy, in our series even men with a short time between vasectomy and reversal had epididymal obstruction. Based on our institutional experience and a review of the literature we recommend that all surgeons offering vasectomy reversals be able to offer VE if required based on intraoperative findings to serve the patient adequately as well as his partner and their future fertility.

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