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THE PATIENT'S GUIDE TO VASECTOMY REVERSAL

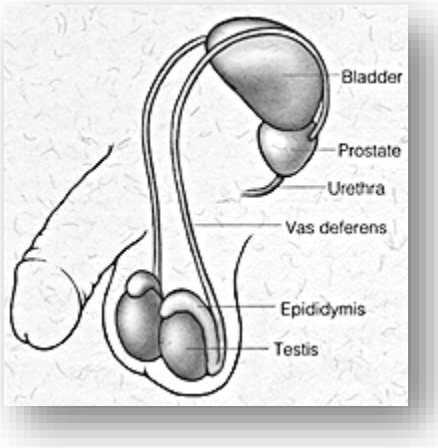
The Basics of Vasectomy Reversal

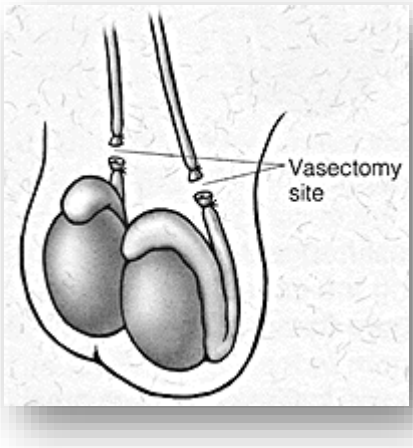
What is a Vasectomy?

A vasectomy is a safe, simple, quick and effective method of contraception.

As shown in Figure 1a, the testicles are continually producing sperm even after a vasectomy. The sperm is stored in the epididymis, located directly above the testicles. Sperm moves from the epididymis through each vas deferens to the prostate, located in front of the bladder. When ejaculation occurs, sperm is expelled from the penis.

Figure 1a and 1b





A vasectomy is a surgical procedure that disrupts the flow of sperm through the vas deferens as illustrated in Figure 1b. The surgeon cuts through the vas deferens and then cauterizes the ends.

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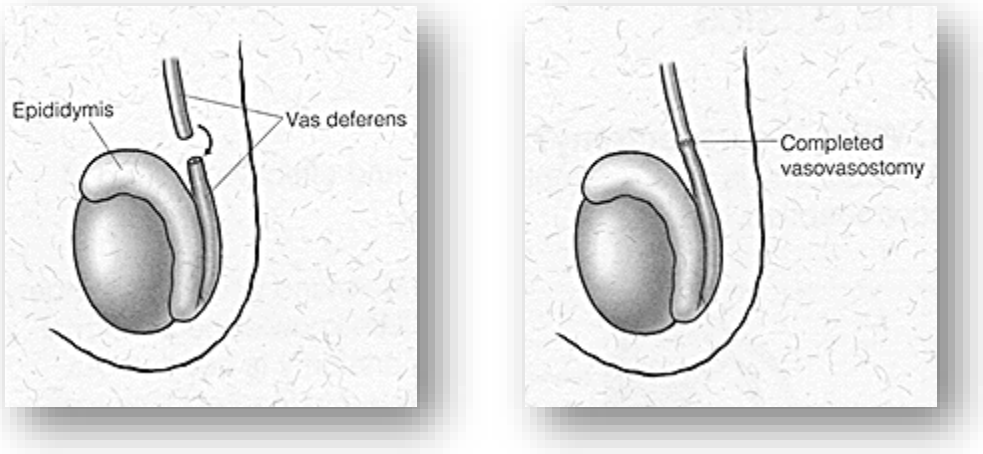
What is a Vasectomy Reversal?

A vasectomy reversal is a surgical procedure that restores the flow of sperm through the vas deferens. It is usually performed by an experienced microsurgeon using specialized instruments, including an operating microscope. The sutures used in vasectomy reversal are finer than human hair.

There are two types of vasectomy reversals: Vasovasostomy and Vasoepididymostomy.

Vasovasostomy is the operation most frequently performed for vasectomy reversal. It entails stitching the cut ends of the vas deferens together as illustrated in Figure 2a and 2b. A vasovasostomy is the surgery of choice for vasectomy reversal.

Figure 2a and 2b



If excessive inflammation or scarring has occurred in the epididymis, sperm may be blocked from getting to the vas deferens. If a blockage has occurred in the epididymis, merely connecting the two cut ends of the vas deferens (as is done in a vasovasostomy) will not solve

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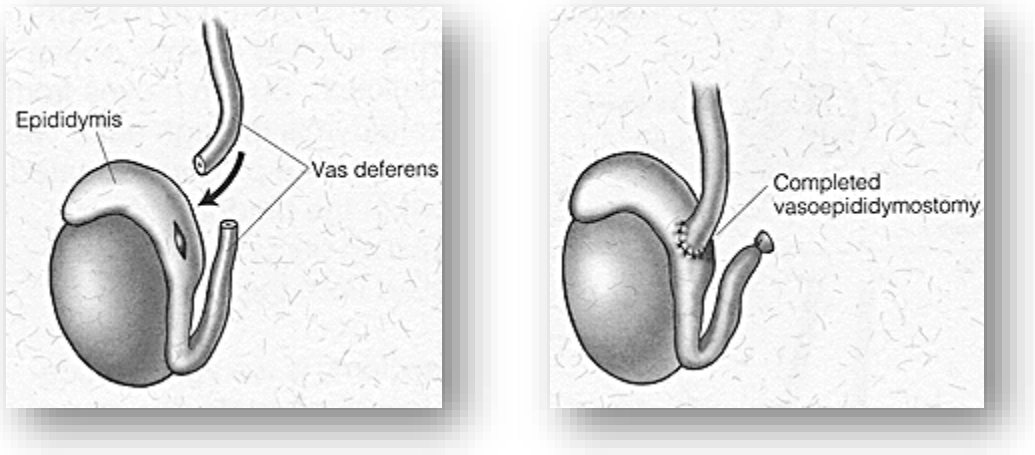
the problem. To bypass the blockage in the epididymis, a vasoepididymostomy must be performed.

A vasoepididymostomy is performed by connecting the vas deferens directly to the epididymis as illustrated in Figure 3a and 3b. One end of the vas deferens is stitched directly to the epididymis.

Figure 3a and 3b



What are the success rates associated with vasectomy reversal?

Before the advent of microsurgical techniques, vasectomy reversal procedures were only occasionally successful. With the relatively recent advances in microsurgical techniques, instruments and suture materials, success rates have greatly increased.

Results of recent studies indicate that following microsurgical vasovasostomy sperm appears in the semen in approximately 85 to 97% of men. Approximately 50 percent of couples subsequently achieve a pregnancy.

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Following microsurgical vasoepididymostomy, sperm appears in the semen in approximately 65% of men. Approximately 20 percent of couples subsequently achieve a pregnancy.

Is vasectomy reversal a common procedure?

Current estimates are that about five percent of men who have undergone a vasectomy will eventually want reversal surgery.

About 500,000 men have vasectomies each year in the United States. While the number of men requesting vasectomy has remained approximately the same, the number of men requesting vasectomy reversal has increased.

Why do men want a vasectomy reversal?

The leading reason that men elect to have vasectomy reversal is because they have a wish to father one or more children. Some men seek vasectomy reversal because of a change in the status of their relationship, and some just change their mind about having children.

A small percentage of men seek reversal for relief of scrotal pain attributed to a past vasectomy.

Can all vasectomies be reversed?

From a surgical standpoint, it is rare that a vasectomy cannot be reversed. In the past, if the epididymis was blocked or a large segment of the vas deferens was removed during the vasectomy, a vasectomy reversal procedure was considered to be too complicated and was unlikely to be successful. Today, however, the development of new microsurgical techniques has provided a way to bypass an epididymal blockage and correct a shortened vas deferens.

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These new techniques have led to improved pregnancy rates following vasectomy reversal even in the most extreme cases.

Does health insurance cover vasectomy reversal?

It is important to check with your health insurance plan to identify what costs of vasectomy reversal may be covered. With the expanding role of IVF and ICSI, which are both expensive treatments which may require several rounds for a successful pregnancy, some insurance companies are considering the lesser cost of a vasectomy reversal.

The Specifics of Vasectomy Reversal

How have microsurgical techniques improved results of vasectomy reversal?

Most surgeons attribute the increased success following vasectomy reversal to the advent and skilled use of the operating microscope (microsurgery). The advantage of using an operating microscope is that the ends vas deferens can be rejoined more accurately. The diameter of the vas deferens is barely perceptible to the human eye (.3 to .5 mm in diameter). As a result, the placement of sutures with the aid of optical magnification (10 to 40 times) is far more accurate.

Microsurgical techniques for the correction of epididymal obstruction (vasoepididymostomy) have also led to improved pregnancy rates following vasectomy reversal. A surgeon who has microsurgical expertise can move from a vasovasostomy to a more complicated vasoepididymostomy when the need arises.

There are two microsurgical techniques available for vasovasostomy: A single layer approximation and a multi-layer approximation. In the single layer technique (as illustrated in

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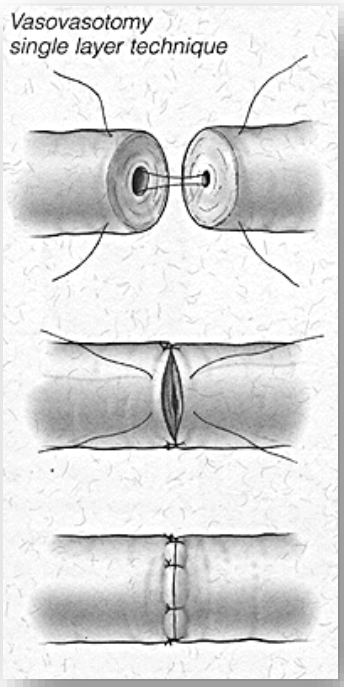
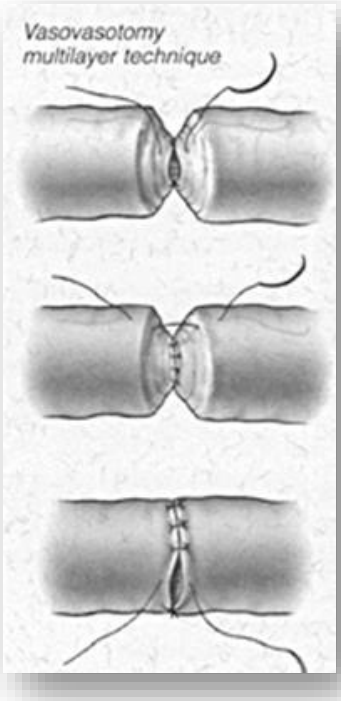
Figure 4a), the inner and outer layers of the vas deferens are joined with the same suture. Six to eight sutures are generally used. Gaps in the outer layer of the vas deferens may be present after the initial sutures are tied. In this case, additional sutures may be used to close these gaps. This is called a modified single layer approximation.

Figure 4a and 4b





In the multi-layer technique (as illustrated in Figure 4b), the inner and outer layers of the vas deferens are each connected separately. Microsurgery for vasoepididymostomy has made it possible to connect the vas deferens precisely to a single epididymal tubule with greater accuracy.

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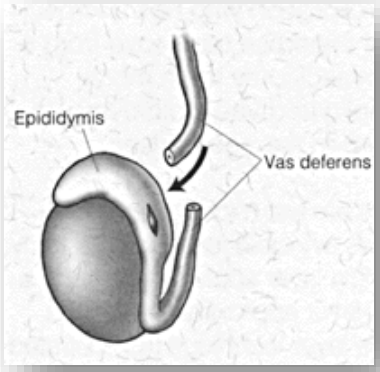
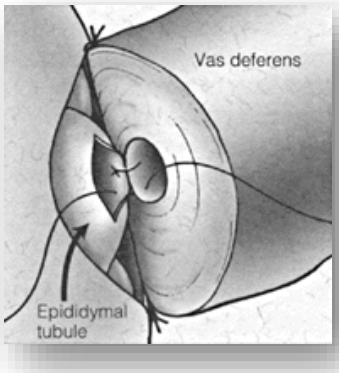
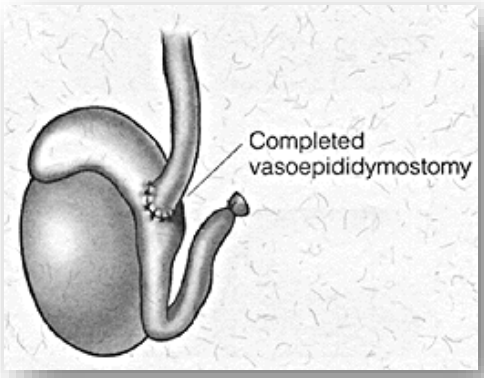
As illustrated in Figures 5a and 5b, the inner layer of the vas deferens is precisely connected with sutures to a small opening in a single epididymal tubule. The outer layer of both the vas deferens and the epididymis are then connected as in Figure 5c.

Figures 5a,5b, 5c







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Are the success rates for a multi-layer vasovasostomy different from a single-layer?

Success rates for both single- and multi-layer vasovasostomy are similar as long as microsurgical techniques are employed by an experienced microsurgeon. In fact, according to a recent report, success rates after a modified single-layer closure was slightly better than a multi-layer closure (57% vs 51% pregnancy rates respectively). Many experienced physicians believe that potential drawbacks to the multi-layer vasovasostomy technique are the increased cost to the patient (more sutures are needed), increased operative time and longer anesthesia time.

When would a surgeon perform a vasoepididymostomy rather than a vasovasostomy?

While a vasovasostomy is the first choice of treatment for vasectomy reversal, vasoepididymostomy, the more complex procedure, is required in approximately one third of cases.

At the beginning of the reversal surgery, the surgeon isolates and excises the scarred ends of the vas deferens. As soon as this is done, the cut ends of the vas deferens closest to the testicles are examined for sperm content and vas fluid quality. Fluid is extracted from the vas deferens by syringe (as illustrated in Figure 6) and Dr. Fisch personally analyzes the fluid using a laboratory microscope.

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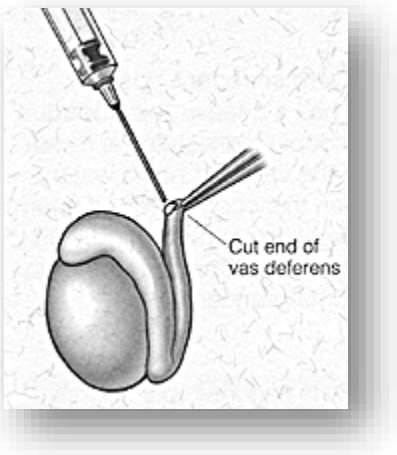
Figure 6



In general, if sperm is present in the vas fluid, a vasovasostomy is performed. If sperm is not present in the vas fluid, a vasoepididymostomy is performed. Lack of sperm in the vas fluid usually indicates rupture and blockage of the epididymal tubules induced by the back pressure which forms after vasectomy. A vasoepididymostomy merely connects the vas deferens to the epididymis at a site which will allow sperm to flow from the epididymis directly into the vas deferens thereby bypassing the site of the blockage.

Vas fluid quality, particularly clarity, is also important. Usually, when sperm are absent, the vas fluid has a cheesy, thick opaque appearance. When this occurs, a vasoepididymostomy is needed. In some rare instances, however, the vas fluid has a watery consistency and is clear in color. When this occurs, even if sperm is absent from the vas fluid, a vasovasostomy is performed. On average, two thirds of these surgeries result in sperm in the ejaculate and one third of couples will become pregnant.

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Am I a Good Candidate for a Vasectomy Reversal?

My vasectomy was done years ago. How does that affect my chances for a successful reversal?

While the length of time from vasectomy to reversal surgery correlates with success, no interval is considered too long to perform reversal surgery.

Data from the largest research study on vasectomy reversal reveals progressively less favorable results as the time from vasectomy to reversal increases. These are the rates for 1,247 men studied who underwent vasovasostomy.

Years between vasectomy and reversal	Chance that sperm will return	Pregnancy Rate
< 3 years	97%	76%
3 - 8 years	88%	53%
9 - 14 years	79%	44%
> 15 years	71%	30%

These data nevertheless indicate that despite long periods of time from vasectomy to reversal surgery (even greater than 15 years), vasectomy reversal can result in successful pregnancies.

One reason for lower success rates with longer intervals between vasectomy and reversal surgery is the increased rate of epididymal blockage as the time interval lengthens. Rupture and obstruction of the epididymal tubule is caused by increased pressure in the vas deferens and epididymis below the level of the vasectomy site. If the epididymis is blocked, vasoepididymostomy needs to be performed to accomplish the reversal.

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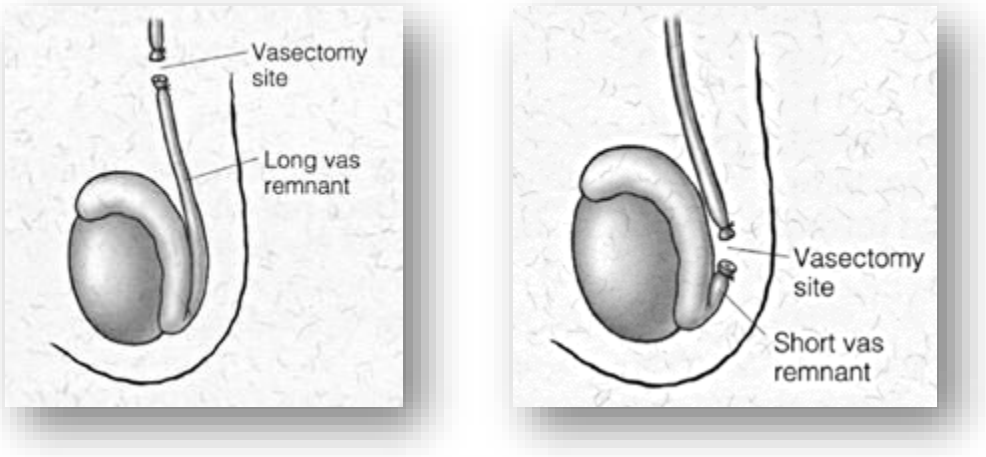
Does the way my vasectomy was performed affect my chances for a successful reversal?

The site of the vasectomy is a factor in the outcome of reversal surgery. A vasectomy can be performed close to the testicle and epididymis or farther away as illustrated in Figure 7a.

Figure 7a and 7b



A disruption of the vas deferens farther away from the testicle will leave a long length of vas deferens (vas remnant) and increase the chance of a successful reversal. The shorter the vas remnant, as illustrated in Figure 7b, the greater the chance of scarring and obstruction in the epididymis necessitating a more difficult vasoepididymostomy.

Can the outcome of my vasectomy reversal be predicted by examining me before surgery?

Dr. Fisch will examine you before surgery by physically palpating your scrotum to determine the firmness and size of the testicles. If you have one or more shrunken testicles, this may indicate irreversible testicular failure; therefore, surgery may not be able to restore fertility.

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If Dr. Fisch encounters an engorged and perhaps firm epididymis, this indicates that an epididymal blockage may be present. While not definitive, these findings may suggest that a vasoepididymostomy will need to be performed. On the other hand, if the epididymis is not engorged, a vasovasostomy is still not guaranteed.

Dr. Fisch will also attempt to determine the length of the vas deferens that has remained after vasectomy (vas remnant) during the same scrotal examination. The longer the vas remnant as illustrated in Figure 7a above, the better the chance for vasovasostomy and future success. The shorter the vas remnant as illustrated in Figure 7b above, the greater the chance that the epididymis will have developed a blockage, necessitating a vasoepididymostomy.

In the rare event that a very long segment of the vas deferens is missing, it is more likely that extensive surgery will be necessary. On occasion, prior surgery such as hernia repair can cause damage to the vas deferens, resulting in a missing segment.

Lastly, disorders of the testicles such as varicoceles (an engorgement of the veins surrounding the testicles which cause damage) can be detected by examining scrotal contents. These disorders may need to be corrected at a later date if vasectomy reversal surgery alone does not lead to pregnancy.

I've already had a vasectomy reversal with no success. Does it make sense to try it again?

A frequent cause of reversal surgery failure is that a vasovasostomy was performed when, on the basis of intraoperative findings, a vasoepididymostomy was indicated. Some other reasons for vasovasostomy failure are inaccurate approximation of the vas due to poor surgical technique, and blockage from scarring as a result of disruption of the blood supply. Success

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rates after repeat reversal surgery are slightly lower than success rates after first reversals, mainly because the duration of vas obstruction is longer for repeat reversal surgery.

Comparison of Overall Results in First and Repeat Reversals

.	First Reversal	Second Reversal
Number of men with sperm in semen	865 out of 1026 (86%)	150 out of 199 (75%)
Number of couples that achieved a pregnancy	421 out of 808 (52%)	52 out of 120 (43%)

The large case study described above compared the results of first and repeat vasectomy reversals. This study reported that, following repeat reversals, sperm were present in the semen of three-fourths (150 out of 199) of men postoperatively and that pregnancy was reported in 52 out of 120 couples (43%) who were evaluated for pregnancy. These results are very similar to those of first reversals and many men feel that these results are high enough to try reoperation.

Chances of a successful repeat reversal procedure may be predicted by the sperm content of the intraoperative vas fluid sampled at the time of the first reversal. If sperm was present in the vas fluid during the initial vasovasostomy and the individual fails to produce sperm in the ejaculate, obstruction at the site of vas reapproximation may exist and the patient may need to repeat the vasovasostomy. If, on the other hand, sperm were absent in the vas fluid, the patient likely required a vasoepididymostomy during the first procedure and will likely require a vasoepididymostomy if the reversal surgery is repeated.

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Is in-vitro fertilization (IVF) a better option for me than vasectomy reversal?

Recent medical and surgical advances have created many options for infertile couples. Choice of infertility treatments usually depends on weighing the likelihood of conceiving with a specific treatment versus other more complex and costly treatments. IVF is a technique that can help couples initiate a pregnancy who might not otherwise be able to conceive through natural methods. IVF involves incubation of human eggs and sperm in a culture dish. For fertilization to occur, the egg must have optimal maturity and the sperm must function normally. Once a fertilized egg develops into an embryo it is transferred back into the female.

Assisted fertilization techniques like IVF are appropriate for men with severe sperm function defects or for men in whom no cause of infertility can be found. Pregnancy rates, however, are very low with routine IVF and are usually coupled with gamete micromanipulation which requires special preparation of the egg and sperm. Intracytoplasmic sperm injection (ICSI) is the most useful micromanipulation technique developed so far to enhance IVF fertilization rates in patients with severe male factor infertility This procedure involves the direct injection of a single sperm into an egg.

For men who have undergone a vasectomy, sperm is obviously absent from the ejaculate. Therefore, since the IVF/ICSI procedure requires sperm, sperm must be retrieved from the testicle or epididymis through a minor surgical procedure. The procedure for obtaining sperm is less complicated than reversal surgery, but entails local anesthesia, and insertion of a needle into the scrotum (into the testicle or epididymis) to obtain sperm.

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The cost of one cycle of IVF can range from $10,000 to $15,000 depending on the array of infertility factors involved and whether sperm retrieval procedures for the man is necessary. Currently, the national birth rate for IVF, as reported by The Society for Assisted Reproductive Technology, and its parent organization, the American Society for Reproductive Medicine, is only 26.9 percent per cycle.

Because of the expense, lower pregnancy rates, and potential side effects from hormonal therapy for the female partner, reversal surgery, and in most cases, repeat reversal surgery are options of first choice for vasectomized men. IVF is an option to consider if vasectomy reversal is unsuccessful, rather than as an alternative to surgery.

We don't plan on trying to conceive right away. When would be the best time for me to have a vasectomy reversal?

Even if you plan to postpone attempts to conceive, for most couples, it is probably best not to delay the reversal procedure.

Keep in mind that the average time interval from a vasectomy reversal until pregnancy is 12 months, and it takes 24 months postoperatively until the highest percentage of pregnancies is achieved.

Also, the longer the interval between vasectomy and reversal, the less the chance that pregnancy after reversal would occur. This should be understood in context. In other words, although many successful reversals are done several years after vasectomy, when you have the option, sooner is better.

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Testing Prior to Vasectomy Reversal Surgery

Do I need any tests before surgery?

No special preoperative tests are needed before a vasectomy reversal other than the standard lab tests required by some hospitals, ambulatory surgery facilities or anesthesiologists. For men more than 40 years old, an EKG is usually required.

Do tests for anti-sperm antibodies or follicle stimulating hormone levels help predict the success of my surgery?

Measurement of serum anti-sperm antibodies appears to be of little prognostic value with regard to male fertility potential.

Anti-sperm antibodies are proteins that can inhibit the movement and function of sperm. Some research indicates that anti-sperm antibodies may decrease the chances for pregnancy after reversal surgery, however, studies have found little correlation between preoperative testing for anti-sperm antibodies and pregnancy

The difficulty in testing for anti-sperm antibodies before reversal surgery is that only serum (blood) antibodies can be tested, which do not accurately predict the antibodies that may be found in the semen after the operation. Because of these difficulties, most surgeons do not find anti-sperm antibody testing to be useful.

Follicle-stimulating hormone (FSH) is not routinely assayed in men requesting vasectomy reversal.

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FSH is a hormone produced in the pituitary gland that stimulates the testes to produce sperm. An elevated FSH level suggests reduced sperm production and testicular failure, and can indicate that there is less possibility of obtaining a good sperm count after surgery. Men who have a history of fertility prior to vasectomy rarely have an elevated FSH level. On the other hand, if serum FSH is low or normal, it does not necessarily mean sperm production is normal.

It is not unreasonable to measure serum FSH preoperatively in men who have never fathered a child, in men who have abnormally small testicles, or in men whose vasectomies were performed many years prior to reversal surgery.

Should my female partner undergo any tests before I have my vasectomy reversal?

Your wife or other female partner should undergo a gynecological exam to ensure adequate fertility potential. For older couples or those whose family history indicates, genetic counseling may also be helpful.

Your Vasectomy Reversal Surgery

What happens on the day of surgery?

On the night before surgery, patients will need to eat nothing after midnight. Upon arriving at the Manhattan Surgery Center, Dr. Fisch will provide a full discussion and explanation of the procedure, and will obtain consent. Consent will be obtained only with Dr. Fisch. The patient will also speak with the anesthesiologist. After all of the preparation is complete, an intravenous drip will be started and you will be taken into the surgical suite.

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How long will the surgery take?

There are two types of procedures used in vasectomy reversal surgery: vasovasostomy and vasoepididymostomy. While a vasovasostomy is the first choice of treatment for vasectomy reversal, vasoepididymostomy (a more complex procedure) is required in approximately one-third of cases. The decision of which procedure to conduct is made by the surgeon during the surgery.

The surgery takes an average of 2 to 2.5 hours. Microsurgical vasovasostomy takes a little less time, while vasoepididymostomy takes a little more time. The length of surgery also depends on the amount of scarring present from prior surgery, the presence of and degree of inflammation, and the ease with which sperm can be identified in the vas deferens or epididymal tubule.

The length of surgery depends on the type of procedure, the amount of scarring present from prior surgery, the presence of and degree of inflammation, and the ease with which sperm can be identified in the vas deferens or epididymal tubule.

What happens during the surgery?

A vasectomy reversal is usually performed through incisions in the front of each side of the scrotum.

The incision is vertical (up and down) so that it can be extended if more length is needed. If there is difficulty in locating the site of the vasectomy, if the vasectomy was performed at a very high scrotal level, or if a long segment of the vas deferens was removed, it may be necessary to extend the scrotal incisions up to the lower inguinal (abdominal) region.

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If a prior hernia procedure was performed, inadvertent blockage of the vas deferens may have occurred. If this is the case, an incision into the site of the prior hernia repair may be necessary.

At this point, Dr. Fisch will evaluate the vas deferens and the sperm quality and perform either a vasovasostomy or a vasoepididymostomy.

What happens after the vasectomy reversal surgery?

Normal signs and symptoms after surgery include: slight swelling, bruising or discoloration of the scrotal area. These generally do not require a doctor's attention. A sore throat, headache, nausea, constipation and general "body ache" due to the anesthesia and surgery may also be present. These symptoms usually resolve within a few days.

Severe complications that require additional surgery are rare. Postoperative complications that require prompt attention are wound infections and severe scrotal hematoma (black and blue bruised scrotum). A wound infection is present if you develop a fever or if your incision becomes warm, swollen, red, or painful. A hematoma is present if excessive bleeding under the skin occurs and is accompanied by a throbbing pain and a bulging of the incision site.

Will I be able to go home the day of the surgery?

The surgery will be performed in an ambulatory surgery center, generally on a day-surgery basis. The patient will arrive in the morning and leave the same day.

How much discomfort can I expect after surgery?

Discomfort after vasectomy reversal varies from patient to patient. In general, pain may be similar or slightly more severe than the pain experienced after the original vasectomy. Pain

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medication such as codeine is prescribed and is usually only necessary for one to two days after the surgery, after which acetominephin (such as Tylenol) or ibuprofen (such as Motrin or Advil) is all that is needed. To decrease the pain and swelling after surgery, ice packs are recommended, which are placed on the scrotum for approximately ten minutes every half hour for the first post-operative day. A scrotal support is worn for four weeks after the surgery to decrease discomfort and lessen swelling. Normal strenuous activity can be resumed four weeks after the surgery if indicated by your physician.

What Happens After My Reverse Vasectomy Surgery?

How soon can I have sex after surgery?

It is generally best to wait three weeks after the surgery before resuming any type of sexual activity.

How long after the surgery will it take for sperm to re-appear?

The first semen analysis is obtained one or two months after the surgery and again at two to three month intervals, either until sperm counts and motility are normal, or pregnancy occurs.

Three months after a vasovasostomy the semen analysis often reveals a good sperm count with poor motility. After 6 months the count is usually stable or slightly improved and the motility is significantly improved. After a vasoepididymostomy, sperm usually takes longer to appear in the ejaculate, and in most cases takes at least 4 to 6 months to appear.

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Is there any chance that my sperm count will decline after an initially successful vasectomy reversal?

Studies have shown that, following initially successful reversal surgery, where good sperm counts and motility have been obtained, a significant number of men subsequently experience significant deterioration in sperm counts. Approximately 10 percent of men following successful vasovasostomy and approximately 20 percent of men following successful vasoepididymostomy will experience deterioration in sperm counts when followed for at least two years after surgery.

A decline in sperm counts after successful surgery can be caused by the formation of scar tissue which can occur from sperm leakage at the reversal site or from a disruption of the blood supply at the site of the surgery.

In light of the 10 to 20 percent of patients that deteriorate after successful surgery, sperm banking should be a consideration, particularly after a vasoepididymostomy.

How soon can I expect a pregnancy to occur after my vasectomy reversal?

The average time from reversal surgery to conception is 12 months. Studies indicate that pregnancies after reversal surgery can occur from one month to 82 months after reversal surgery. Most pregnancies occur within 24 months of reversal surgery.

What are my options if the surgery is unsuccessful?

About 14 percent of men with vasovasostomies and 40 percent with vasoepididymostomies have no sperm in their semen after surgery. After vasovasostomy, sperm is usually present in

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the semen after two months and should certainly be present within six months. After vasoepididymostomy, sperm usually appear in the semen during the first six months, although they may not appear for as long as 12 to 15 months. If sperm are not present in the semen by six months after vasovasostomy or by 12 to 18 months after vasoepididymostomy, then the reversal surgery is considered a failure.

If surgery is unsuccessful you can consider reoperation or assisted reproductive techniques such as in-vitro fertilization (IVF) with intracytomplasmic sperm injection (ICSI). For a man who has no sperm in the ejaculate after reversal surgery, sperm for IVF/ICSI can be obtained through a minor surgical procedure (sperm retrieval) which extracts sperm directly from the testicles and/or epididymis.

How can I contact Dr. Harry Fisch?

Please contact Dr. Fisch by phone at (212) 879-0800 or visit his website: www.harryfisch.com/contact/ and request a consultation through his online form.

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