

How to Treat

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VASECTOMY and VASECTOMY REVERSAL

Introduction

VASECTOMY is an elective surgical sterilisation procedure that involves division and occlusion of both vasa deferentia to prevent the passage of sperm from the testes to the penis in order to prevent conception. While the intent of the procedure is to achieve permanent contraception, vasectomy can be reversed in most men who wish to restore their fertility as a result of a change of mind or personal circumstance. In Australia vasectomies are performed in a range of settings including general

practices, family planning centres, hospital outpatient clinics, day surgeries and general hospitals.

Vasectomy is the only method of male contraception that is both highly effective and well accepted by patients. Compared with tubal occlusion methods (ligation, clips, rings, resection) vasectomy is as effective in preventing pregnancy; however, vasectomy is regarded as simpler, faster, safer and less expensive.

Vasectomy reversal is one of two effective treatment options for men

who have had a vasectomy seeking to restore their fertility. The other option is sperm extraction followed by IVF. Undertaking vasectomy reversal as initial management provides a wider range of future therapeutic options and a higher cumulative chance of pregnancy than sperm extraction with IVF. Sperm extraction may reduce the prospect of a future successful vasectomy reversal because it may damage either the epididymis or the rete testis where sperm collects. A vasectomy reversal simplifies and optimises future

IVF procedures because it removes the need for repeated sperm extraction if pregnancy is not achieved in the first round of IVF.

Vasectomy reversal via vasovasostomy and vasoepididymostomy requires advanced microsurgical methods and is usually performed as inpatient procedures in a day surgery facility. This article discusses the indications and clinical considerations for the procedures of vasectomy and its reversal.

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Demography

BETWEEN 15,000 and 16,000 vasectomies are performed annually in Australia.

Australia is one of fewer than 10 nations in which vasectomy is more common than fallopian tube occlusion for female sterilisation. It is currently six times more popular than tubal ligation as a method of contraception. This ratio has changed remarkably over the past 30 years, as tubal occlusion was more frequent than vasectomy in 1980.

Fewer than 1% of the vasectomies performed annually are for men aged younger than 25 years of age and 90% are for men aged



30-49. The age of men undergoing vasectomy has been increasing consistently.

Over the past decade the incidence of vasectomy has decreased by about one-third (about 24,000 vasectomies were undertaken in 2004/05). Meanwhile, the Australian Institute of Health and Welfare reports that one-quarter of men aged 40 and over have undergone a vasectomy.

The steady increase in the use of progestin-laden IUDs and subcutaneous implants for female contraception, which can have the combined benefit of a reduction of menstrual symptoms as

well as contraceptive efficacy, is one factor contributing to the reduction in the frequency of vasectomy.

Men who undergo vasectomy are typically well educated, married with higher incomes and more likely to have a tertiary education.

About 70% of such men are by definition in the middle to high socioeconomic group. They tend to have greater contact with the medical system and are more likely to undergo regular medical check-ups by comparison with those who do not have vasectomy.

Vasectomy

Preoperative considerations

Effectiveness

VASECTOMY is one of the most effective methods of birth control. It is about 33 times more effective than oral contraception and about 90 times more effective than condoms. Pregnancy occurs in about 15 out of 10,000 couples after vasectomy. Almost all pregnancies following vasectomy occur within the first year after the procedure.

Preoperative counselling

As with any surgical procedure, a discussion with the patient about the risks, benefits and alternatives to vasectomy is required. The box, right, outlines the information that should be discussed before proceeding with a vasectomy.

While most vasectomies can be reversed, preoperative counselling should be based on the surgery being considered as a permanent method of contraception. A thoughtful exploration of the patient's motives and understanding is important in order to minimise the prospect of regret.

Preoperative assessment

A general medical history should be obtained on bleeding diatheses and other possible contraindications to surgery.

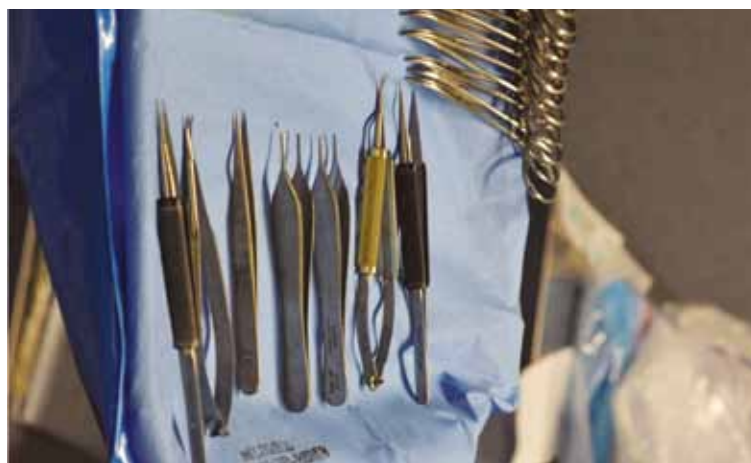
A physical examination of the genitalia should be performed before vasectomy. This may be undertaken immediately before the operation. Abnormality of the testis or epididymis should be noted.

Unilateral congenital absence of the vas occurs in about 1 in 400 men; as this condition is associated with cystic fibrosis gene mutations, a full family history should be taken and the patient and his relatives should undergo genetic testing for this mutation.

Patients who have a history of other significant medical conditions will require the appropriate preoperative investigations. No other specific tests are necessary.

Surgical methods

Vasectomy can be performed in almost all patients with local anaesthesia alone using a fine bore needle for infiltration (25-32 gauge). Sedation and general anaesthesia are alternative options if the preoperative examination indicates that isolation of the vas will be particularly difficult or painful, or if they are preferred by the patient or surgeon.



Essential information to discuss with the patient prior to vasectomy

- Vasectomy is intended to be a permanent form of contraception
- Vasectomy does not lead to immediate sterility
- Another form of contraception is necessary until azoospermia is confirmed by post-vasectomy semen analysis
- The risk of pregnancy after vasectomy is about 1 in 2000 for men who have post-vasectomy azoospermia
- Repeat vasectomy is necessary in $\leq 1\%$ of men
- Patients should refrain from ejaculation for about one week after vasectomy
- Complications such as symptomatic haematoma and infection occur following 1-2% of vasectomies. Post-vasectomy pain syndrome occurs after vasectomy in about 1-2% of men and may require additional surgery

The two key surgical steps in performing vasectomy are:

- Isolation of the vas, by either the conventional or the minimally invasive technique; and
- Occlusion of the vas.

Conventional vasectomy

Either one midline or bilateral scrotal incisions are made with a scalpel (figure 1). Incisions are usually 1.5-3.0cm long. No special instruments are used. The vas is usually grasped with a towel clip or Allis forceps (figure 2). The area of dissection around the vas is usually larger with this technique than occurs with no-scalpel or minimally invasive techniques.

There are several different methods of vasal occlusion including cautery with or without fascial interposition, ligatures and clips (figure 3). The method of occlusion should be one of personal preference as there is no significant difference in their failure rates.

Open-ended vasectomy, where the testicular end of the vas is not occluded, is associated with less postoperative pain but higher failure rates. Excision of a segment of vas deferens for histological exam-

ination is superfluous and not recommended.

Minimally invasive vasectomy

Minimally invasive vasectomy uses specific instruments such as the vas ring clamp and vas dissector to isolate the vas and then pull it through a small scrotal hole. The incision is usually smaller than 1cm. The ends are either cauterised or tied off and then put back in place. The area of dissection around the vas is kept to a minimum.

No-scalpel vasectomy

A common variant of the minimally invasive technique is known as the 'no-scalpel vasectomy'. With this method a vas ring clamp is applied around the vas, peri-vasal tissue and overlying skin before making the skin opening. Then the skin is pierced to create an opening of $\leq 10\text{mm}$. The tissue overlying the vas is then spread with the vas dissector to expose the bare anterior wall of the vas, which is then pierced with one tip of the vas dissector. A supination manoeuvre is then used to elevate the vas above the skin opening. Part of the vas is then regrasped and the posterior dissection is com-



Figure 1: A 1.5-3.0cm long midline scrotal incision in conventional vasectomy. This allows for good surgical exposure to the vas deferens.



Figure 2: Use of Allis forceps to grasp the vas when isolating it and dissecting it from surrounding tissue.



Figure 3: Ligation of the vas to achieve vasal occlusion.

pleted with the vas dissector to isolate the vas from surrounding peri-vasal tissue and vessels. The vas is divided with or without excision of a vas segment, and then occlusion

of the vas is performed in a manner and with a preference similar to conventional vasectomy. Usually the skin opening can be left unsutured.

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Post-vasectomy considerations

Post-vasectomy semen analysis

VASECTOMY is not immediately effective. Another method of contraception should be used until the remaining sperm are cleared out of the semen. This takes 15-20 ejaculations. Even then, some men will still have sperm in the semen and will need to have further semen analyses.

A semen analysis to assess the success of vasectomy should be undertaken three months post-vasectomy. Patients may cease using other methods of contraception when azoospermia has been achieved.

Vasectomy failure occurs in fewer than 1% of vasectomies and is determined by the presence of any motile sperm six months after vasectomy. The recanalisation rate following initial documentation of azoospermia is 0.51% for vasal ligation and 0.28% where diathermy is used to ablate the vasal lumen. Where azoospermia is not achieved or if recanalisation occurs, repeat vasectomy should be offered.

Recovery

After a vasectomy, most men go home the same day and, in the absence of complications, can be normally active within a week. Sexual activity can resume after one week, when it is comfortable to do so.

Risks and complications

Vasectomy is generally uncomplicated. The discomfort that occurs after surgery usually settles promptly with no sequelae. Haematoma, infection, chronic pain, sperm granulomas, vasectomy failure, and patient 'regret' are all documented risks and complications.

Haematoma, infection and chronic scrotal pain sufficient to disrupt quality of life occur following 1-2% of procedures. Sperm granuloma is rarely symptomatic. There has been one report of death



Just as many men (5%) report an increase in sexual satisfaction after vasectomy as those who report a decrease.

after vasectomy due to Fournier's gangrene, a necrotising mixed aerobic and anaerobic bacterial infection of the perineum.

The risks of intraoperative and early postoperative pain, bleeding and infection are related mainly to the method of vas isolation. The available evidence indicates that minimally invasive vas isolation procedures result in less discomfort during the procedure and in fewer postoperative complications.

Prophylactic antibiotics are not indicated unless the patient has a high risk of infection, especially if he has multiple comorbidities. The failure rates of vasectomy are related to the method of vas occlusion.

Regret

Rates of dissatisfaction with vasectomy and/or regret at having undergone the procedure are about 1-2%. Men who had vasectomy before the age of 30 are more likely to feel regret and request vasectomy reversal.

Prostate cancer

While initial epidemiological

studies suggested an association between vasectomy and prostate cancer, more recent studies demonstrate that vasectomy and prostate cancer do not have an overall causal link.

Sociodemographics play a part — men from middle to high socioeconomic backgrounds are more likely to opt for vasectomy and are consequently more likely to be screened for prostate cancer during vasectomy-related consultations with a urologist or a GP with an interest in male health. As prostatic cancer is usually asymptomatic and slowly progressing, it is not generally detected in men that do not undergo regular screening.

This also means that prostate cancer in men who have had vasectomies are more likely to be diagnosed at an earlier stage and lower grade, consistent with more regular screening for the disease. There is no increase in the risk of testicular cancer.

Sexual function

While many men are concerned that vasectomy may affect sexual function, there is little evidence that this occurs. Just as many men (5%) report an increase in sexual satisfaction after vasectomy as those who report a decrease. Patients may be assured that there is currently no good evidence of any negative effect on sexual function.

Other conditions

There is no increase in the risk of coronary or vascular disease, hypertension or dementia following vasectomy. Vasectomy does not change the risk for sexually transmitted diseases.

Management of complications

While the common complications are potentially serious, conservative management mostly leads to spontaneous resolution. To alleviate significant chronic scrotal pain

the patient may need to undergo a vasovasostomy or epididymectomy, and in rare instances, orchidectomy.

Sperm antibodies

Between 50% and 70% of men develop circulating anti-sperm antibodies following vasectomy. The precise cause of the development of sperm antibodies is uncertain. The so-called 'testis-blood barrier' usually minimises exposure of sperm. Leakage of sperm at the time of vasectomy is likely to contribute to the development of sperm antibodies. The presence of circulating anti-sperm antibodies correlates poorly with the probability of conception post-vasectomy reversal.

Testicular changes after vasectomy

Pathological changes in testicular histology commonly occur following vasectomy. Electron microscopy has shown that interstitial fibrosis was present in the testis of 23% of men following vasectomy and that some evidence of adverse impact on spermatogenic cells within the seminiferous tubules is almost universal. There is no correlation between these testicular changes and the presence or absence of anti-sperm antibodies.

Medicolegal aspects

Vasectomy has been the subject of a considerable amount of litigation. Cases most commonly reflect limited patient understanding of the risk of pregnancy while some sperm are still in the semen post-vasectomy, and chronic post-vasectomy pain, among other factors. Injury to or loss of a testis, while rare, is highly likely to lead to legal action. While the various techniques of vasectomy may result in minor variations in the frequency of complications, if both vasa deferentia are divided, technique-related complications are seldom a cause for litigation.

Vasectomy reversal

BETWEEN 4% and 5% of Australian men who have had vasectomy later seek reversal. The Australian Institute of Health and Welfare data indicate that 500-600 vasectomy reversal operations are performed annually. Nationally, both vasectomy and vasectomy reversal are now substantially more common than fallopian tube occlusion for sterilisation and microsurgical fallopian tube reanastomosis for sterilisation reversal.

Indications

By far the most common reason for vasectomy reversal surgery is a desire to achieve pregnancy with a new partner following a change of relationship. Fewer than one in 30 men who undergo vasectomy reversal are in the same relationship that produced any children conceived pre-vasectomy.

About 1% of men develop post-vasectomy pain of sufficient severity to interfere with quality of

Vasectomy reversal — key points

- Vasectomy reversal is a technically feasible means to restore fertility in men who previously have had a vasectomy
- Experienced surgeons using microsurgical techniques achieve the highest technical success rates
- For the average man undergoing vasectomy reversal, pregnancy rates range between 50% and 70%
- Postoperative patency rates (return of sperm to the semen) and pregnancy rates after vasectomy reversal procedures decrease as the interval between vasectomy and its reversal increases
- Female age is the single most important predictor of pregnancy following vasectomy reversal
- The choice between vasovasostomy and vasoepididymostomy is made at the time of surgery, after determining the extent and level of obstruction
- Prior sperm extraction for IVF reduces the prospect of future successful vasectomy reversal, whereas vasectomy reversal increases the chance of future successful IVF
- Although harvesting sperm for cryopreservation at the time of vasectomy reversal is possible, it may not be useful or cost-effective

life. Although the pathogenesis of post-vasectomy pain syndrome is unknown, vasectomy reversal provides effective relief in up to two-

thirds of cases, with some benefit in about half of the remaining men. Rarely a man may seek reversal for psychological, psychosexual

or religious reasons. The box, left, outlines the key points that should be discussed with the patient considering vasectomy reversal.

Preoperative assessment

Clinical history

When taking the patient's history, the GP should enquire about the patient's age, reproductive history (ie, history of having fathered children or achieved pregnancy previously in the same or other relationships). The duration of time since the vasectomy and whether there were any postoperative complications from the vasectomy should be ascertained. A general medical history should be taken with specific questioning about hereditary or acquired bleeding diatheses or anticoagulant therapy.

Physical examination

Physical examination is generally uninformative and not usu-

ally predictive of outcome. It may reveal that large segments of the vas deferens were removed and help to identify those in whom the standard incision may need to be modified. Examination also may reveal testicular abnormalities or epididymal induration. Epididymal fullness suggests obstruction at that level but does not predict accurately which patients will require vasoepididymostomy. Obesity may increase technical difficulty and increase the risk of haematoma.

Investigations

Preoperative testing of men contemplating vasectomy reversal is unnecessary except for routine preoperative tests that may be required or preferred as a result of the patient's general medical state. The presence of circulating sperm agglutinins is not sufficiently sensitive or specific to predict the out-

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come of vasectomy reversal and has largely been abandoned by reproductive microsurgeons as a preoperative test.

Female fertility

Female age is the single most important factor in determining the prospect of pregnancy after vasectomy reversal. Before vasectomy reversal is performed for restoration of fertility, evaluation of the female partner's reproductive potential is prudent. A reproductive history and, where indicated, assessment of ovarian function and pelvic anatomy may be necessary to properly advise the patient about his chances of achieving pregnancy or fathering further children with the woman in question following vasectomy reversal.

Surgical methods

Placement of incision

Vasectomy reversal is usually performed through oblique incisions on either side of the anterior aspect of the scrotum. When the vasectomy was performed high in the scrotum or removed a large segment of the vas deferens, it may be necessary to extend the scrotal incisions upward into the lower inguinal region to provide ready access to the vasectomy site.

Mobilisation of vas deferens

The vas should be mobilised sufficiently to avoid any tension on the site of the anastomosis. After division of the vas deferens on either side of the vasectomy site, the prepared ends are approximated. A specialised clamp designed to facilitate approximation and anastomosis is extremely useful in this process (figure 4).

The entire scarred portions of the vas above and below the vasectomy site should be avoided to ensure anastomosis of healthy tissue. In most instances the site of the vasectomy does not require excision and may be left in situ. If it is removed, then care must be taken to ensure the completed anastomosis does not come in contact with an area that has been subject to diathermy, which is used to eliminate bleeding in the process of excision. Diathermy should not be used on the opposing transected ends of the vas. To prevent damage to the vas, only precise microscopically directed diathermy is used to cauterise blood vessels located in the surrounding adventitia.

Examining the sperm

Some authors recommend assessment of the presence, concentration and motility of sperm at the testicular end of the vas deferens to see whether vasoepididymostomy rather than vasovasostomy should be performed. However, current evidence indicates that motile sperm are present in only 35% of men undergoing vasovasostomy despite a higher than 90% postoperative patency rate; hence it is now rarely necessary to perform this assessment.

Suturing technique

Most surgeons perform anastomoses using fine monofilament nylon sutures (figure 5). The actual anas-

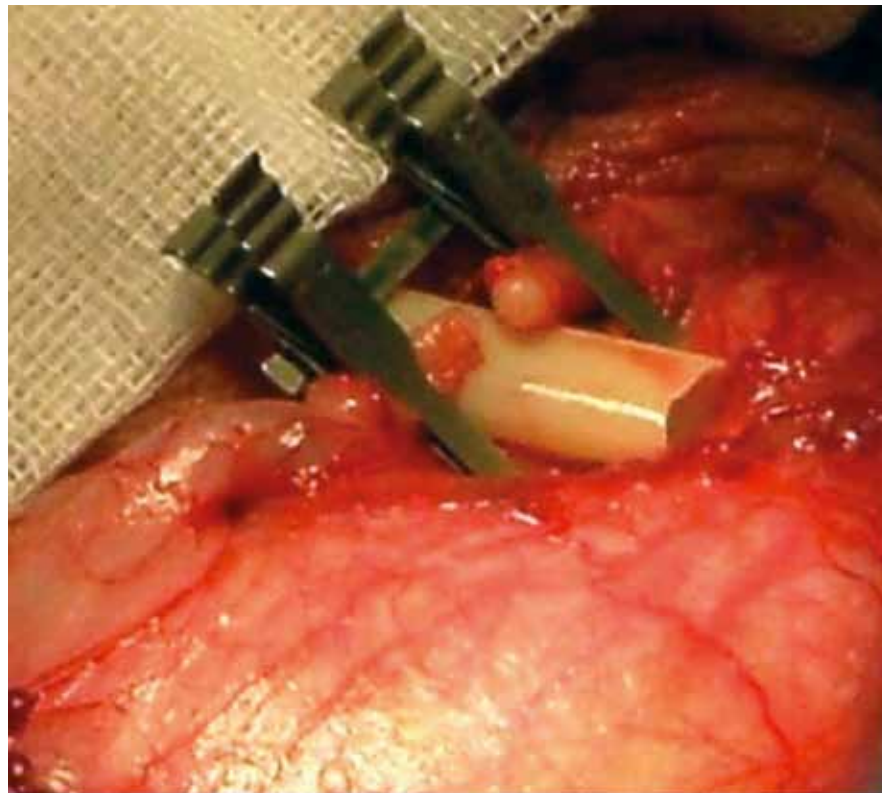
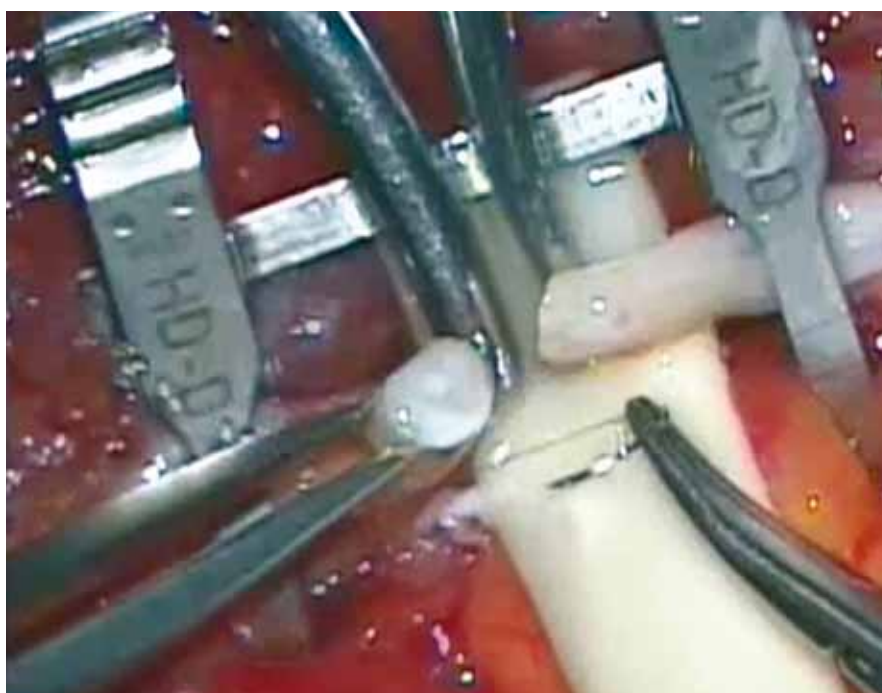


Figure 4: The ends of the divided vas are mobilised so that they can be approximated to avoid any tension on the site of the anastomosis after vasectomy reversal.

Current evidence indicates that motile sperm are present in only 35% of men undergoing vasovasostomy despite a higher than 90% postoperative patency rate.



Figure 5: Fine monofilament nylon sutures are used to join the anastomosis between the ends of the divided vas.



tomosis is generally performed with a multi-layered anastomosis placing five to seven interrupted 8-0 or 9-0 nylon sutures through the full-thickness of each end of the vas, with additional interrupted sutures in the outer muscular and adventitial layers, placed between the full-thickness sutures (figure 6). Some surgeons prefer to perform vasovasostomy using a two- or three-layered microsurgical anastomosis by first placing 5-8 interrupted 10-0 nylon sutures in the inner mucosal edges of the ends of the vas, incorporating a small portion of the inner muscular layer, and then 7-10 additional interrupted 9-0 nylon sutures in the outer muscular and adventitial layers.

Vasoepididymostomy

The decision to undertake microsurgical vasoepididymostomy is based on the surgical anatomy, the extent of collateral damage from the prior vasectomy and positioning of the vasectomy site. Vasography is not required. Some authors have recommended that the presence, motility and morphology or absence of sperm at the testicular end of the transected vas should be used to decide intraoperatively to proceed to vasoepididymostomy. Patency rates from microsurgical vasovasostomy in the absence of any visible sperm are higher than those for vasoepididymostomy and so the latter is most commonly performed for redo vasectomy reversal after an initial failed procedure.

When vasoepididymostomy is required, the scrotal contents must be extruded to incise the tunica vaginalis. The procedure is performed using an end-to-side anastomosis with a single epididymal tubule pulled up into the lumen of the vas deferens. Four to six interrupted 10-0 nylon sutures are used to oppose the mucosa of each and the outer muscular layer of the vas is approximated to the incised edges of the epididymis tunic with a series of interrupted 9-0 nylon sutures.

Intraoperative sperm retrieval

Intraoperative sperm harvesting for the intended purpose of possible future attempts to conceive using IVF with intracytoplasmic sperm injection (ICSI) is both controversial and problematic. The local laboratory needs to have the capacity for cryopreservation of any harvested sperm in a manner suitable for use in ICSI. Prior to the introduction of ICSI, sperm obtained during the operation could not be used for either intrauterine insemination or conventional IVF because their numbers and motility were too low to be useful.

The nature and quality of sperm collected from the cut testicular end of the vas deferens is universally suboptimal. It is cytoplasmically degraded and has high levels of DNA fragmentation as a result of a combination of factors:

- Vasectomy-related obstruction of flow along the epididymis and vas deferens.
- The physical distance from testis to vasectomy site.
- The release of autosomal

enzymes upon lysis of sperm in situ.

- The delay from production of sperm in the testis to its availability for retrieval.

Motile sperm obtained from the epididymis (by comparison to the vas deferens) is of higher functional capacity. In all cases, the technical aspects of vasovasostomy or vasoepididymostomy should have priority over attempts to harvest sperm for cryopreservation.

Many authors have concluded that sperm harvesting during vasectomy reversal is neither useful nor cost-effective. When it is considered, both the patient and his partner should be provided detailed information on the nature, practicality, risks and cost both of IVF and of long-term sperm storage.

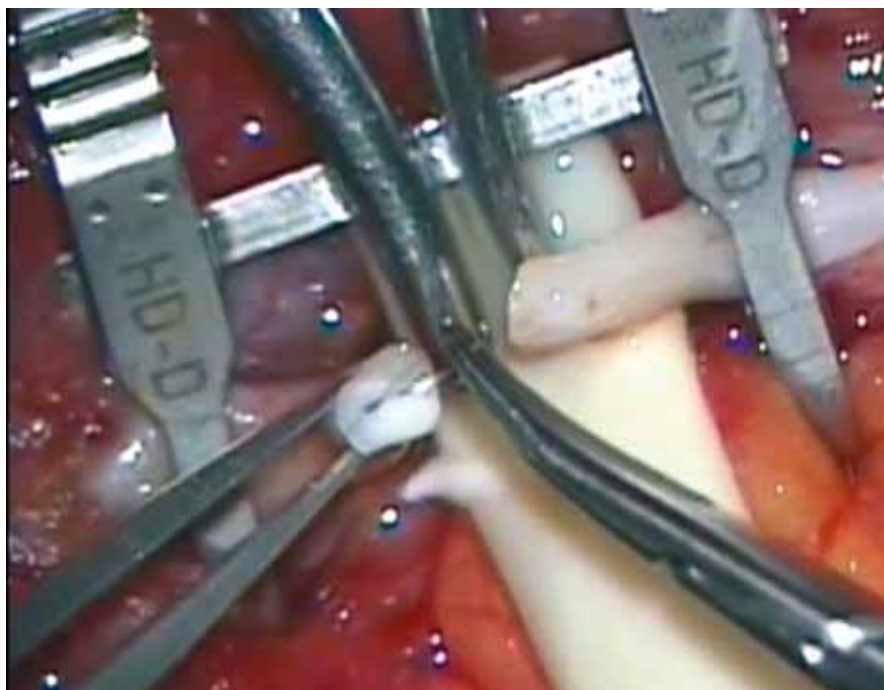


Figure 6: The anastomosis to reverse a divided vas is usually multilayered with interrupted 8-0 or 9-0 nylon sutures.

Post-reversal considerations

Postoperative care

POSTOPERATIVELY, the use of scrotal drains and perioperative antibiotics depends on the individual surgeon. There should be a low threshold for the short-term (four hours) use of scrotal drains because they do decrease both haematoma and postoperative infection rates.

Patients should be advised to use a scrotal supporter and to avoid sexual intercourse and strenuous physical activity for four weeks after surgery. Postoperative pain generally can be controlled adequately with oral analgesics.

Postoperative monitoring

A semen analysis should be obtained about three months post-operatively. Should the initial semen analysis not reveal sperm or have 'virtual azoospermia' (sperm only visible following centrifugation of the sample) then repeat analysis should be undertaken three months later.

In men who do not achieve a pregnancy, further monitoring of semen quality may identify the small number who develop late obstruction due to scar formation at the anastomotic site. The incidence of postoperative reobstruction ranges from 1% to 3% after microsurgical vasovasostomy and as high as 35% following vasoepididymostomy.

If sperm do not return to the semen by six months after vasovasostomy or by 18 months after vasoepididymostomy, the procedure should be considered to have failed. Most pregnancies that are achieved without further intervention occur within 24 months of surgery.

Return of sperm

Fertility after successful vasectomy reversal (as defined by both sperm in the ejaculate and conception) has a strong inverse correlation with pathological changes in the testes post-vasectomy.

Technical success for the average man undergoing microsurgical vasovasostomy is high with patency rates (ie, return of sperm) of 90-95%. Sperm usually returns gradually in a progressive manner. About 50% of men will have sperm present by six weeks after the reversal surgery; by 10 weeks this rises to



80%, then 90% by 12 weeks and 95% by six months.

Effect of time since vasectomy

The outcome is better for those with a shorter time from vasectomy to reversal. As the interval between vasectomy and the reversal surgery increases, the patency rate declines from 95% at less than 10 years to about 90% at 15 years, about 80% at 20 years and 70% at 25 years after vasectomy. Rather than being directly related to anastomotic patency, this decline in patency rates over time is more likely to be the result of either vasal or epididymal obstruction by inspissated cellular debris accumulating on the testicular side of the vasectomy site. This accumulation of cellular debris may form concretions within the vas or epididymis, thereby leading to additional sites of occlusion. Early publications that hypothesise epididymal blowout as a primary mechanism of surgical failure remain controversial and need to be validated.

Effect of prior IVF procedures

Importantly, if epididymal sperm aspiration and testicular needle aspiration have been performed to obtain sperm for IVF before vasectomy reversal, patency rates are significantly reduced.

When the patient had previously undergone bilateral percutaneous epididymal sperm aspiration

(PESA), patency rates after vasectomy reversal surgery are lower than 30%; if the aspiration was unilateral this figure is higher at about 70-80%. The lower patency rate is because the diameter of an epididymal tubule is considerably smaller than that of a 25-27 gauge needle used for PESA, so damage to and subsequent obstruction of the epididymis is almost inevitable.

For testicular sperm extraction (TESE) the negative effect is somewhat less with patency rates between 80% and 90%. The pathophysiological mechanism is most likely outflow obstruction as consequence of inadvertent collateral damage to the intratesticular collecting system (rete testis), post-procedure fibrosis consequent upon both multiple passes of the aspirating needle through the testis and resolution of intratesticular haematoma. A small incisional biopsy of the testis is unlikely to have a similar effect.

Microsurgery vs macrosurgery

Microsurgical methods generally lead to higher patency rates compared with macrosurgical techniques. There is a direct correlation between the number of cases of microsurgical vasectomy reversal previously performed by the surgeon and patency rates. Therefore, in order to provide optimal patency and pregnancy rates, surgeons who perform vasectomy reversal should undertake formal microsurgical training.

Patency rates following macrosurgical vasovasostomy are about 70% and for microsurgical vasoepididymostomy performed by experienced microsurgeons about 65%.^{1,2} It should be noted, however, that vasoepididymostomy is usually only carried out in the most surgically challenging of cases.

Pregnancy rates

Depending on the interval between vasectomy and reversal and on the age of the patient's partner, the overall postoperative pregnancy rate after microsurgical vasectomy reversal is between 50% and 80%. Following microsurgical vasoepididymostomy it is 30% to 50%. The pregnancy rates following macrosurgical vasovasostomy are lower, with 20-40%

of partners conceiving.^{1,2}

Anti-sperm antibodies

Some investigators have suggested that anti-sperm antibodies may decrease the chance of successful pregnancy after vasectomy reversal. Studies into pregnancy rates following vasectomy reversal demonstrate a mean postoperative conception rate of between 60% and 85% for patients who undergo microsurgical vasovasostomy within 15 years of their vasectomy.

Management of operative failures

Repeat operation may be offered if the primary vasectomy reversal fails. Repeat procedures may be more difficult technically because the remaining viable segments of the vas will be shorter. In the largest published study on the topic, sperm returned to the semen after repeat surgery in 75% of men, and 43% of their partners subsequently conceived.³ Repeat attempts at vasectomy reversal should be considered, particularly when the prior operation had been performed macrosurgically or by a surgeon performing small numbers of microsurgical procedures.

After a failed vasoepididymostomy, a repeat procedure may or may not be possible, depending on the amount of scar tissue that forms around the epididymis after the first operation.

Risks and complications

Complications following microsurgical vasectomy reversal are uncommon. Haematoma is by far the most frequent, varying between 0.5% and 3%, which is markedly reduced by drainage of the operation site. Infection either of the wound or underlying haematoma occurs in fewer than 1% of operations. Rarer still are wound problems and chronic postoperative pain.

Occasionally patients may develop short-term urinary retention following surgery. Fournier's gangrene has not been reported following vasectomy reversal. Medico-legal action is rare provided that patients are well informed about the nature of the procedure and the potential postoperative complications, along with its success and failure rate.

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Further reading

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Declaration of interest statement

Dr Robert Woolcott is a non-executive director of Genea, which provides assisted reproductive treatments including IVF.

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Conclusion

VASECTOMY is an effective method of male contraception. It is a straightforward procedure and has few risks and complications.

Preoperative counselling and detailed discussions exploring the patient's understanding of the procedure and expectations helps prevent patient regret after the procedure. Close adherence to postoperative instructions and follow-up is important to ensure its success and minimise potential risks of failure, pain and haematoma. Microsurgical techniques help reduce these risks further. Vasectomy is not associated with a higher risk of prostate or testicular cancer, sexual dysfunction, coronary or vascular disease, hypertension or dementia. The patient should be reminded that vasectomy does not change their risk for sexually transmitted diseases.

Vasectomy reversal is more successful if it were performed earlier rather than later. However, even at 25 years post-vasectomy, the patency rate following reversal surgery is still a high 70%. Past IVF-associated percutane-

Even at 25 years post-vasectomy, the patency rate following reversal surgery is still a high 70%.



ous epididymal sperm aspiration and testicular sperm extraction can both negatively affect the success rate of vasectomy reversal. This should be discussed with the patient who has had a vasectomy and is considering IVF with his partner. The risks of reversal sur-

gery are similar to the initial vasectomy.

It is important to address the factors that affect the fertility of the patient's partner and discuss how this can lessen the rate of successful pregnancies post-reversal surgery despite a high patency rate.

Online resources

Vasectomy Reversal Australia
[author's own website]
www.vasectomyreversalaustralia.com.au

Urology Care Foundation
Vasectomy reversal
<http://bit.ly/1jN3MEh>

Andrology Australia
Expert video: Vasectomy, What is It, and How Does It Work?
<http://bit.ly/1mmAbWQ>

Fact Sheet: Understanding Vasectomy
<http://bit.ly/1jN3MEh>

Wikipedia – Vasectomy Reversal [a seriously good review]
en.wikipedia.org/wiki/Vasectomy_reversal



How to Treat Quiz

Vasectomy and vasectomy reversal
— 4 July 2014

INSTRUCTIONS

Complete this quiz online and fill in the GP evaluation form to earn 2 CPD or PDP points. We no longer accept quizzes by post or fax.

The mark required to obtain points is 80%. Please note that some questions have more than one correct answer.

GO ONLINE TO COMPLETE THE QUIZ

www.australiandoctor.com.au/education/how-to-treat

1. Which TWO statements are correct regarding preoperative counselling for vasectomy?

- a) Patients should be advised that vasectomy, while reversible, is intended to be a permanent form of contraception
- b) Patients should be warned that vasectomy is not as effective as condoms or oral contraceptives
- c) Patients should be reassured that vasectomy provides sterility straightaway
- d) GPs should discuss expectations with the patient and advise that repeat vasectomy is necessary in $\leq 1\%$ of men

2. Which TWO statements are correct regarding the preoperative assessment for vasectomy?

- a) The preoperative assessment should include a general medical history that identifies any bleeding diatheses
- b) A physical examination of the genitalia may be undertaken immediately prior to the vasectomy
- c) Patients found to have unilateral congenital absence of the vas in the preoperative assessment should have full chromosomal analysis prior to the operation
- d) Patients with no significant medical conditions will still require an urogram in the preoperative assessment

3. Which TWO statements are correct regarding the surgical methods when performing a vasectomy?

- a) Vasectomy almost always needs to be performed under sedation
- b) Conventional vasectomy requires a surgical incision of 1.5-3.0cm long
- c) Excision of a segment of vas deferens for histological examination is not recommended
- d) Cautery as a method for vasal occlusion has a much higher failure rate than using ligature

4. Which TWO statements are correct regarding postoperative care after a vasectomy?

- a) Most men go home the same day as the vasectomy
- b) A semen analysis is usually undertaken three months post-vasectomy
- c) Patients should abstain from sexual activity for three months after vasectomy
- d) Patients are encouraged to ejaculate 15-20 times in the first week after vasectomy

5. Which TWO statements are correct regarding the risks and complications of vasectomy?

- a) Complications such as symptomatic haematoma and infection occur following 1-2% of vasectomies
- b) Vasectomy failure occurs in about 7% of vasectomies
- c) Evidence shows that vasectomy significantly reduces sexual function
- d) Testicular interstitial fibrosis occurs in 23% of men following vasectomy

6. Which TWO statements are correct

regarding preoperative counselling for vasectomy reversal surgery?

- a) The patient should be advised that the pregnancy success rate for vasectomy reversal is about 30%
- b) Patient expectations should be tempered with the advice that female age is the single most important predictor of pregnancy success following vasectomy reversal
- c) Patients should be advised to have sperm extraction prior to the reversal procedure to increase their chances of achieving pregnancy with their partner
- d) For men with post-vasectomy pain requesting reversal surgery, advice should be given that the procedure provides effective relief in up to two-thirds of cases

7. Which THREE preoperative assessments should be obtained before vasectomy reversal surgery?

- a) The patient's reproductive history
- b) The length of time since the vasectomy
- c) The female partner's ovarian function
- d) The level of circulating sperm agglutinins

8. Which TWO statements are correct regarding postoperative care after vasectomy reversal surgery?

- a) Short-term use of scrotal drains lowers the rate of postoperative haematoma and infection
- b) No further semen analysis is needed if sperm is visible after centrifugation
- c) Patients should be advised to avoid sexual

- intercourse for four weeks after vasectomy reversal surgery
- d) Any postoperative pain is significant and should prompt immediate review by the surgeon

9. Which TWO statements are correct regarding the risks and complications of vasectomy reversal?

- a) Haematoma complicates 0.5-3% of microsurgical vasectomy reversal surgery
- b) Wound infection occurs in about 5% of vasectomy reversal surgery
- c) Urinary flow is not affected by vasectomy reversal surgery
- d) Postoperative reobstruction occurs in 1-3% of patients after microsurgical vasovasostomy

10. Which THREE statements are correct regarding the successful outcome and return of sperm following vasectomy reversal surgery?

- a) Most pregnancies that are achieved without further intervention after vasectomy reversal occur within three months of surgery
- b) Return of sperm following microscopic vasovasostomy occurs in about 90-95% of men
- c) The success rate of vasectomy reversal decreases with the length of time since the vasectomy
- d) Vasectomy reversal is considered to have failed if sperm do not return to the semen by six months after vasovasostomy

CPD QUIZ UPDATE

The RACGP requires that a brief GP evaluation form be completed with every quiz to obtain category 2 CPD or PDP points for the 2014-16 triennium. You can complete this online along with the quiz at www.australiandoctor.com.au. Because this is a requirement, we are no longer able to accept the quiz by post or fax. However, we have included the quiz questions here for those who like to prepare the answers before completing the quiz online.

NEXT WEEK Brain tumours are a life-changing disease that can vary from benign meningiomas to aggressive glioblastoma multiforme. The next How to Treat looks at the epidemiology and risk factors of brain tumours, with a focus on primary CNS tumours, which account for a disproportionate share of cancer-related morbidity. The article also gives an overview of the GP's role in the management of the different types of brain tumours. The author is **Dr Robert Hitchins**, medical oncologist, Bond University, Robina, Queensland.