Sterilisation (Vasectomy and Female Sterilisation)

Sterilisation is a surgical means of obtaining permanent contraception by occluding the Fallopian tubes in women and the vas deferens in men. Compared to many surgical procedures, sterilisation is fraught with cultural, religious, psychosocial, psychosexual and psychological issues despite being an effective method of contraception for those in stable relationships who are certain they have completed their child-bearing.

The history of sterilisation is controversial and infringements of reproductive rights continue around the world today. It is essential therefore that we ensure that decisions regarding sterilisation should be freely made and that there should be no coercion by any partner, family, health or social welfare professional.

Epidemiology

The popularity of tubal occlusion appears to be on the decline in the UK, possibly because of the availability of equally effective alternatives. Since 2000, there has been a significant reduction in numbers of both male and female sterilisation.

In England, for example:

- There were 8,904 female sterilisations in 2012/2013 compared to 35,300 in 2000/2001.
- There were 14,142 vasectomies in 2012/13 compared to 41,100 in 2000/2001.

Worldwide, female sterilisation has a higher prevalence but in developed countries vasectomy is more common.

Consent

Sterilisation is an operation and hence requires informed consent. The nature and extent of informed consent is discussed in the separate article Medical Ethics. If there is any question of a person not having the mental capacity to consent to a procedure that will permanently remove their fertility, legal advice should be sought. From a legal perspective, only the patient who submits to operation needs to give consent and the operation can be performed without knowledge of the partner. Good practice, however, is that both partners should be involved in the counselling prior to the procedure.

A consent form should be signed and there should be clear documentation about the discussion which was held, the information which was given and any requests made by the individual.

As well as the usual topics to be covered in informed consent, there are specific matters that must be made clear in counselling both in primary and secondary care:

- Failure rate - no operation is perfect and there is a small but finite failure rate for sterilisation. The rate varies between procedures and surgeons and failure of an operation does not necessarily indicate poor surgical technique or clinical negligence.
- Irreversibility - sterilisation must be seen as an irreversible procedure. Reversal operations are performed: best results are achieved with microsurgery but success rate as defined by successful pregnancy is very limited and the operation is not available on the NHS.
- Time constraints - a woman is sterile immediately after the operation although she can conceive in the pre-operative menstrual cycle and thus must be counselled to avoid sex or use effective contraception until the menstrual period following the operation, as very early pregnancy may be undetectable. A man must not consider himself to be sterile until semen samples with no spermatozoa have been confirmed. This is usually 12-16 weeks after the operation and may require one or two tests.
- Choice of procedure - couples should be informed that vasectomy carries fewer risks as a procedure and has a lower failure rate in terms of unwanted pregnancies.
- Alternative options - information should be given about all alternative methods of contraception including long-acting reversible methods of contraception (LARC).
- Limitations - couples should be aware sterilisation does not protect them against sexually transmitted infections.

These points must be documented in the records, as they may be crucial if, for example, subsequent pregnancy occurs and litigation follows.

Counselling

Ideally, the couple should be seen and counselled together but in reality this may not be possible. They must understand that sterilisation is irreversible and be sure that, even if tragedy were to befall their family, neither would wish to have more children. Provide clear written guidance to accompany any discussion.

To reduce regret:
Technique

Vasectomy is a less invasive surgical procedure than female sterilisation, as it does not require access to the abdomen. Vasectomy is usually performed under local anaesthesia, although the less robust may prefer to be unconscious at the time. This allows it to be done as a day case, outpatient procedure or even in a GP surgery. Female sterilisation can be performed laparoscopically (under general anaesthetic) or hysteroscopically (under local anaesthetic). Attendant risks of the laparoscopic procedure should not be underestimated. Female laparoscopic sterilisation can be performed under local anaesthesia. Some men, and also some women, may feel that irreversible curtailment of their fertility is an affront to their manhood or womanhood. If this is so, it must not be ignored or psychosexual problems may ensue. It should be mentioned that the man will perform and ejaculate in exactly the same way except that he will be "firing blanks". Where a woman has an indication for hysterectomy (eg, fibroids, menorrhagia, prolapse, ovarian mass), this will provide definitive sterilisation. The use of the intrauterine system (IUS) and endometrial laser ablation have reduced the use of hysterectomy for menorrhagia, however. A particular problem is where sterilisation is required for the health of the woman. Primary pulmonary hypertension is an example where pregnancy will cause deterioration and can even be fatal, and oral contraceptives are contra-indicated. With the risk to the woman posed by general anaesthetic, it may be tempting to opt for vasectomy instead but the disease has such a poor prognosis that, potentially, the male partner may be widowed and infertile at an age when the prospect of remarriage and further children is not unreasonable.

Alternatives to sterilisation

Whilst sterilisation was once considered the only solution to the long-term risks of hormonal contraception or repeated pregnancies, the increasing options, particularly of LARC, make this concern less problematic.

- Combined oral contraception (COC) can be used with older women provided they do not have significant or multiple risk factors for cardiovascular disease or other contra-indications.
- Progestogen-only methods include progestogen-only contraceptive pills (POCPs), depot injections, implants (Nexplanon®) and the IUS. There are generally fewer contra-indications to use of progestogen-only methods as compared to combined hormonal contraception. [4]
- Barrier methods used most commonly are male condoms and caps but their reliability and acceptability can be poor.
- Colls - copper intrauterine contraceptive devices (IUCDs) can be used at any age but women identified as being at higher risk for sexually transmitted infection should be screened prior to insertion. The IUS is increasingly chosen for reliable, long-term and reversible contraception combined with its ability to reduce menstrual bleeding, making it particularly suitable in women prone to menorrhagia. Its increasing use may be reducing the incidence of female sterilisation.

Vasectomy

- The aim is interruption of the vas deferens.
- Local anaesthesia should be used where possible. To reduce the pain of this injection, a fine-gauge needle should be used and the local anaesthetic agent warmed to approximately 37°.
- A minimally invasive approach is advised. This is also referred to as a no-scalpel approach; however, the Faculty of Sexual and Reproductive Healthcare (FSRH) guidelines take this to mean a procedure where the opening in the scrotal skin is less than 10 mm in diameter, and any surgical instrument may be used (including a scalpel). Cochrane reviews have shown this method results in fewer early complications and a shorter operation time. [5]
- The vas deferens is exposed and isolated. The lumen is occluded and the vas deferens is then divided. There may or may not be a part of the vas deferens excised. Various methods are used for occlusion such as:
  - Coagulation/cauterisation - thermal or electrical cautery.
• Ligation with sutures or clips.
• Insertion of intra-vas devices.
• Fascial interposition - should be considered additionally to reduce the risk of early recanalisation. Spermatic fascia is attached to the end of the occluded lumen.
• Irrigation of the vas (with the theoretical advantage of flushing out stored sperm more quickly).

• A 2014 Cochrane review did not find enough evidence to firmly support the use of one technique over another; however, it did find using fascial interposition reduces the risk of early recanalisation and therefore vasectomy failure.[6] FSRH guidelines recommend cauterisation followed by division, with or without removal of a segment of vas deferens, and advise against the use of clips.
• Confirmation of success requires postoperative semen analysis to confirm azoospermia. There is inconsistency about optimal timing and frequency for this testing; however, FSRH guidelines advise testing at 12 weeks post-vasectomy and that no further tests are needed if the first confirms azoospermia. Furthermore, they state that irrigation has not been found to reduce the time it takes to this result.
• The couple should be advised to continue with alternative methods of contraception during this time.
Vasectomy complications

- Bleeding into the scrotum and haematoma formation.
- Infection. (Incidence of bleeding and infection is reduced by the use of minimally invasive techniques.)
- Epididymitis.
- Sperm granuloma, a tender scrotal swelling near the proximal end of the vas - requires further excision.
- Persistent pain. This may occur in the testicles, scrotum, penis or lower abdomen. The frequency of this has been estimated to be between 1-14%. In some men this may be severe.
- Contraceptive failure. Statistics vary but failure rates should be less than 1%. For counselling pre-operatively, failure rate should be quoted as 0.05% (1 in 2,000) after clearance has been given following a negative sperm count.

There is no evidence that vasectomy increases the risk of:

- Testicular cancer.
- Immune complex disease.[3]
- Coronary heart disease.
- Libido problems or changes to sexual function or pleasure.

FSRH guidance advises that there is no evidence of a causal relationship between vasectomy and cancer of the prostate, although a number of studies have shown an association.[7]

Despite being considered a more "minor" operation than female sterilisation, postoperative discomfort must not be underestimated and the man should arrange to take a few days off work if it is sedentary and probably a week if manual. A firm scrotal support should be worn after the operation and the degree of pain is highly variable. Failure to rest increases the risk of haematoma.

Female sterilisation[1]

This can be performed hysteroscopically, laparoscopically or as an open procedure.

Hysteroscopic tubal occlusion

Hysteroscopic sterilisation is accomplished by tubal cannulation and placing intrafallopian implants (Essure®) into the Fallopian tubes.[8] The procedure is performed by passing the hysteroscope through the vagina and cervix and passing a very small implant (the micro-insert) into each Fallopian tube through the hysteroscope. The presence of the micro-inserts causes scar tissue to form in the Fallopian tubes, which eventually blocks them, preventing the eggs from reaching the uterus and becoming fertilised. This fibrosis formation takes about three months to block the tubes effectively.

Contraception should be used until imaging (X-ray or ultrasound) has confirmed that the micro-inserts are correctly positioned. Hysterosalpingogram (HSG) may also be required in some patients to ensure tubal occlusion. Imaging should be performed three months after the procedure and additional contraception used until the microstents have been shown to be in the correct place. This method has been found to be safe with low rates of adverse effects and high rates of patient acceptability.[9] Failure rates are low, with a five-year failure rate of 1 in 500.

Laparoscopic tubal occlusion

Laparoscopic tubal occlusion involves inserting a needle into the abdomen to insufflate and then the laparoscope is inserted. Using Filshie® clips to mechanically occlude the Fallopian tubes is the laparoscopic method of choice. Other options of occlusion are a modified Pomeroy technique, which involves ligation of the tubes and excision of a section, or diathermy.

Laparoscopic tubal occlusion can be performed at any time during the menstrual cycle provided that the clinician is confident that the woman has used effective contraception up until the day of the operation. Otherwise, defer until the follicular phase of a subsequent cycle. A pregnancy test should always be done prior to the procedure. Women should be advised to continue their previous method of contraception until seven days after the procedure.

There is a risk of damage to bowel or blood vessels, which is increased by obesity, an inexperienced operator and abdominal adhesions. Women should be warned about the risk of proceeding to a laparotomy in the event of complications. The cosmetic results of laparoscopy are excellent. Lifetime failure rate is estimated to be 1 in 200. When tubal occlusion fails, there is an increased risk of ectopic pregnancy.

Mini-laparotomy

Mini-laparotomy is rarely used in the UK other than when laparoscopy fails or is contra-indicated. It takes slightly longer and is associated with more minor morbidity.

A small incision is made just above the pubis at the level of the pubic hairline. Forceps can be used to pull up the tubes that are identified, divided and tied. It is usual to remove a small piece for histology to prove that the Fallopian tube was identified correctly. The cut ends are tied back to assure separation. Reversibility is no worse than with other techniques and the resulting scar is small, neat and scarcely visible.

Complications
If technical difficulties arise during a laparoscopy, the operation may need to be converted to an open procedure. The risk of laparotomy is increased if the patient is obese or has had previous abdominal surgery. The risk of having to proceed to a laparotomy during laparoscopy due to major complications has been reported as 1.9 in 1,000 procedures; however, there are no large recent studies.

The risk of death associated with laparoscopy has been reported as 1 in 12,000 procedures. Again, this figure is not based on recent studies.

After tubal occlusion, women should be advised to seek medical advice if they have abdominal pain or vaginal bleeding or if they think they might be pregnant, due to risk of ectopic pregnancy.

Sterilisation is associated with an increased rate of hysterectomy, although the reasons for this are unknown. There is no evidence to suggest sterilisation causes significant hormonal change or a worsening of menstrual problems, although women may report this.

There is no evidence that sterilisation is associated with an increased risk of ovarian, endometrial, cervical or breast cancer.

Further reading & references
- Contraception - sterilization; NICE CKS, June 2012 (UK access only)

1. Male and female sterilisation; Faculty of Sexual and Reproductive Healthcare (September 2014)
2. NHS contraceptive services: England Community Contraceptive Clinics 2013-14; Health and Social Care Information Centre (HSCIC), 30 October 2014
4. UK Medical Eligibility Criteria for Contraceptive Use; Faculty of Sexual and Reproductive Healthcare (2009 - Revised May 2010)

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