

Vasectomy

by *K. B. Kuah*

**M.B., B.S.(S'pore), M.R.C.O.G.(U.K.),
A.M.(Malaysia), F.I.C.S.**
The Clinic for Women
15, Jalan 14/20,
Petaling Jaya,
Malaysia.

Summary

A SERIES OF vasectomy carried out in private practice is recorded. After two unintentional pregnancies in the early months of this series the technique of managing the cut ends of the vasa is modified. There has been no unwanted pregnancy since.

The complication rate in this series is low.

The majority of the operations is carried out through a single mid-line incision.

Introduction

It is becoming very obvious that population control, and in particular the permanent methods of population control is the answer to this ever growing population and ever decreasing food supply. The argument for and against the above statement can be carried on ad infinitum. However two facts have to be borne in mind. One, based on the present 2% growth rate in population, the projections indicate that there will be 8 billion people on this earth by the year 2005. It has also been estimated that the earth will support no more than 10 billion people. At the present rate of population growth this will be attained just 50 years from now. There is yet another way to look at this. The average time for the world population to double itself is 35 years. At this rate there will be one billion billion people on earth in 1,000 years. This amounts to 2,030 people per square meter (1,700 people per square yard.) (Wallace & Riddle 1971.) Secondly, inflation and stagflation apart, the pundits tell us that the world today has a food reserve of 7 days.

Temporary methods of birth control have been used for many decades all the world over. In many countries legal abortion has been allowed to help curb population growth. As yet, the countries that need population control most, countries that are termed under-developed or developing, are the

countries that still show a population growth of more than 2 percent.

Legal abortion is unlikely to be introduced in Malaysia for some years. Sterilization seems the best answer for population control for the time being. Female sterilization has been practised and is widely practised today. Vasectomy, male sterilization has been practised for a decade or so, but is less well-known. A statement from a certain organisation recently gave the impression that only doctors from that particular organisation are qualified to perform vasectomy. In fact, general surgeons, gynaecologists and general practitioners with appropriate training should be able to perform this simple operation and contribute to the population control program.

The primary objectives of voluntary vasectomy is to block the vas completely with minimal morbidity, immediate and long term, while at the same time avoiding any procedure which will make subsequent reanastomosis technically impossible.

History of Vasectomy

Vasectomy has a long and interesting history. The first recorded reference to the occluded vas was made by John Hunter during his dissections in 1775. He observed a case in which a vas deference was obstructed and replaced by a fibrous cord while the corresponding testicle was of normal size and appearance. Sir Astley Cooper, in 1830 noted that

ligation of the vas in dogs had no effect on spermatogenesis and the epididymis became enlarged to accommodate the sperms. (Quoted by: Hackett & Waterhouse 1973.) There was considerable controversy as to the clinical effects of vas ligation in the latter part of the 19th century. Vasectomy was also advocated in the treatment for benign prostatic enlargement during this time. In the early part of this century, vasectomy was used for eugenic purposes.

The popularity of vasectomy as a mode of population control is of shorter history. India and the Peoples Republic of China are reputed to be the leading countries to carry out vasectomies on a large scale.

Preoperative Interview

Obviously, the surgeon has his indications before a man is considered for vasectomy. As a general rule, if the couple are absolutely sure they no longer want any additional children they should be considered for vasectomy. Some surgeons may insist on a minimum age in addition to the minimum number of live children. Once a couple has been ear-marked for vasectomy, the surgeon should have a full discussion with the patient as well as his wife. It is essential that the couple understand that the operation will not affect their pattern of sexual behaviour in any way. The commonest misunderstanding in this part of the world is that vasectomy is equated with castration, by the public. They should be made to understand that the hormones which play some part in controlling sexual behaviour are released and carried by the blood stream and this is not affected by the operation. It should also be made clear that the testes contribute only a small proportion of the volume of the ejaculate. One of the more convincing proof of this, is that even with his trained eyes, the surgeon is unable to differentiate an ejaculate specimen from a vasectomised patient and one from a non-vasectomised patient.

The question most commonly asked by patients is, 'what happens to the spermatozoa that continue to be produced?'. Physiologically, the normal process of reabsorption are accelerated. The other important question is that of reanastomosis. As a basic rule if the patient is truly concerned about this, I discourage him from the operation as I feel that he is not ready for such an operation. Technically, vasovasectomy is possible. The results depend entirely on the person performing the operation. It must be remembered that anatomical success does not go hand in hand with physiological success. The effects of antibodies formation has to be borne in mind also; Kleinman 1972 and Phadke and Pudukone 1964.

Anaesthesia

There may be some differences of opinion but the majority of surgeons carrying out vasectomy are satisfied with local infiltration analgesia. This seems adequate for most patients and has two big advantages

1. It is safer than general anaesthesia.
2. It is cheaper than general anaesthesia.

In the present series, all operations were done under local infiltration analgesia. The agent used is 2 percent lignocaine without adrenalin. Usually 2 to 4 mls of this agent is used.

Principles of Technique

Figure 1 shows the male reproductive system. Spermatogenesis takes place in the testes and the spermatozoa are then transferred to the seminal vesicles. They are stored here until ejaculation when they are transferred into the urethral passage. Here, prostatic discharge is secreted and this forms the bulk of the ejaculate. Vasectomy aims at interrupting the transfer of formed spermatozoa from the testes to the seminal vesicles. Hence, a man is not immediately sterile following vasectomy as there will be a store of spermatozoa already in the seminal vesicles. These have to be discharged before the man can be proclaimed sterile. The ligation of any rigid tube like the vas is almost impossible. Ligation with cat-gut or any other surgical suture will only hold this temporarily. Non-absorbable materials tend to cut through the thick wall of the vas if tied too tightly. Diathermy fulguration has been found reasonably effective. However, it sometimes produces pain along the cord. Furthermore, the vas is notorious for spontaneous reanastomosis. To this end the best technique is to divide the vas and then somehow prevent the mucosa of the two free ends from coming into contact with each other. There are various ways to achieve this. In this present series, the free ends are turned away from each other and secured upon itself.

Preparation: The anterior aspect of the scrotum is shaven of any hair that may be present. The whole pubic area is then thoroughly cleansed with an antiseptic solution, Salvon. The operation area having been draped, the vas on each side is palpated between the thumb and the index finger as shown in figure 2. Thereafter the local anaesthetic agent is injected as shown in figure 3. The vas of the selected side is then localised using a fine towel clip or a 21G injection needle. (See figure 4)

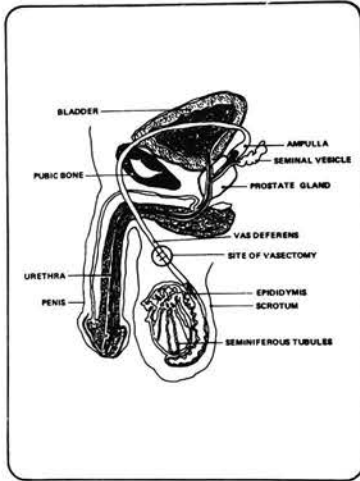


Fig. 1 Male Reproductive System showing the area of Vasectomy.

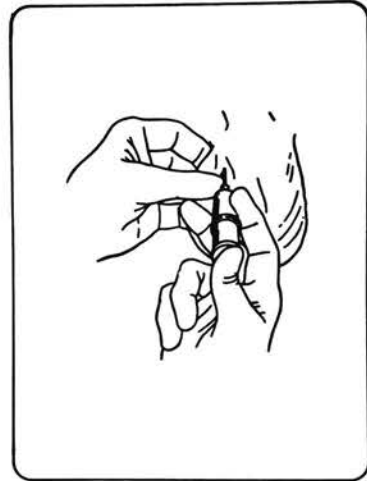


Fig. 3 Injecting Local Anaesthetic.

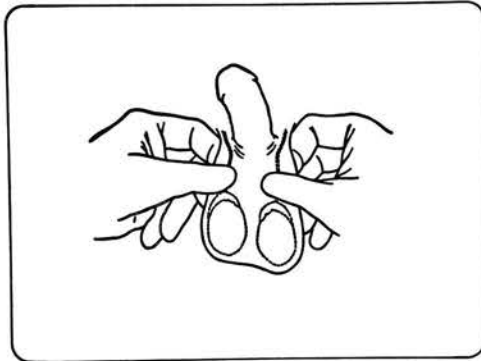


Fig. 2 Feeling to locate vasa deferentia.

Incision: In this series a single incision technique is employed. This incision is made transversely in the midline of the scrotum. It needs be only 1 centimeter in length and no more. This is shown in figure 5. Some surgeons prefer to carry out the operation through two incisions. This seems unnecessary, as both the right and the left vas are accessible through a midline incision.

Ligation: Having made the incision across the localised vas, the vas is easily isolated. The vas is separated from the leach of blood vessels (testicular artery, (see fig. 6) spermatic artery, artery to the vas and the Pampiniform plexus) that accompanies it.

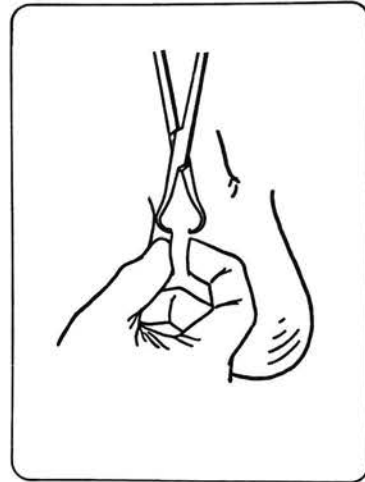


Fig. 4 Vas deferens localised with towel clip.

Thereafter the vas is sectioned and the free ends are ligated and each is turned upon itself away from the other (figures 8, 8 & 9). The small incision is then closed with continuous subcuticular stitches or through and through stitches. (figure 10.)

Materials and Methods

A total of 450 vasectomies was carried out in the 6 years period between 1970 and 1975. All the patients were aged between 30 and 45 years old. There were 403 Chinese, 30 Indians, Pakistanis and Ceylonese, 15 Malays and 3 Caucasians. The patients have all had a minimum of two children each. In the first 35 patients a two incision technique was employed. One centimeter of the vas was

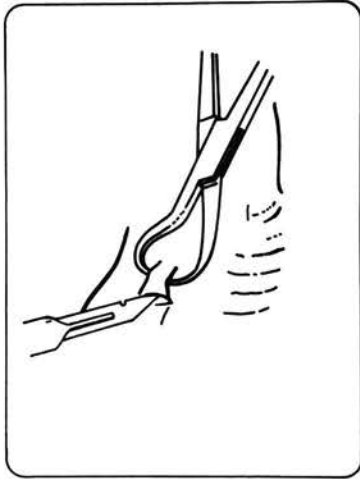


Fig. 5 Transverse incision (1 cm) made.

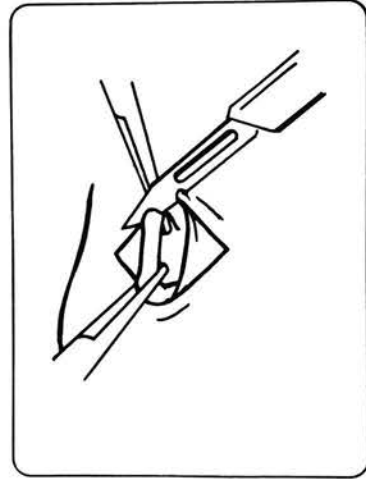


Fig. 7 Vas clamped and cut.

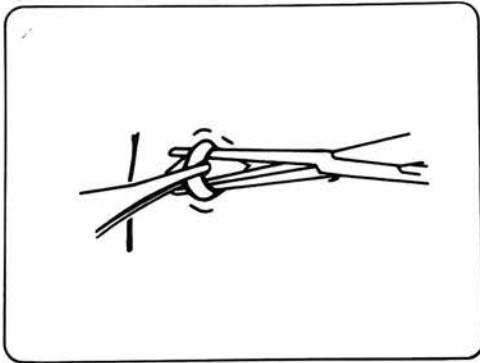


Fig. 6 Vas isolated.

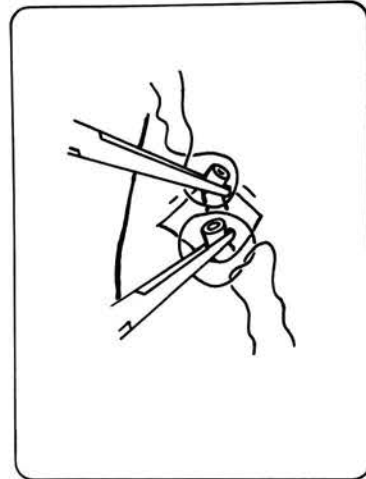


Fig. 8 Cut ends of vas ligatured and turned upon itself.

removed, and the free ends of the vas were left in situ. Thereafter the operative technique as outlined above was followed.

In the follow-up patients were advised to have a minimum of 10 ejaculations before they submit a specimen of ejaculate for microscopic examination. If any evidence of spermatozoa is found the examination is repeated after another 5 ejaculations.

Results:

There were 2 failures in this series. Both these occurred following techniques in which the free ends of the vas was not treated. In the first instance, the patient never had a negative semen following

vasectomy. In the second instance, the patient failed to turn up for semen examination. Four months following vasectomy, he presented himself and informed that his wife was pregnant. This was confirmed when an examination of his semen showed the presence of active spermatozoa. A repeat vasectomy was carried out.

The follow-up rate is very poor indeed. Only about 10% of vasectomised patients turned up for follow-up examination. However, it could be safely presumed that had there been any other failure, the patient would have reported the same complication. Following vasectomy the patient is given

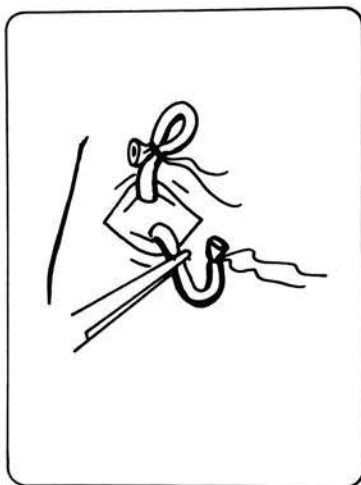


Fig. 9 Ligation of free ends of vas completed.

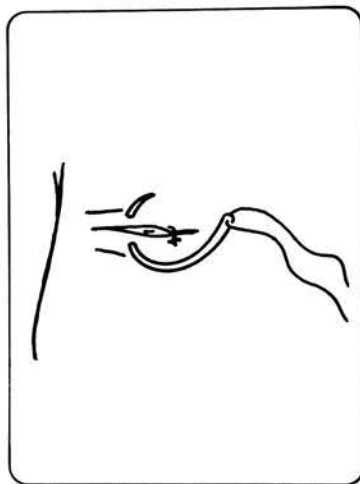


Fig. 10 Skin closure.

instructions that he should report back to the clinic should there be any pain, swelling, bleeding and/or fever. Only 2 patients reported with complications. One reported the day following the operation complaining of pain. Examination did not reveal any significant degree of swelling or any evidence of infection. He was given analgesics in the form of paracetamol and a day's medical leave. The second patient reported at the end of a week following the operation. He had a poor healing of the wound which soon responded to the usual treatment.

One patient presented 17 months following the operation complaining of a lump on each side where the operation had taken place. This was found to

be a fibrous nodule which formed over the cut-end of the vas. The patient was reassured and no treatment was given.

Discussion

Vasectomy is a relatively simple procedure which could be carried out as an office procedure. It is associated with minor complications such as bruising, swelling, pain, wound infection, non-specific epididymitis, pain on ejaculation, haematoma sperm granuloma and post-operative psychological effects. Recanalization is certainly a factor to be considered but with careful treatment of the free ends of the divided vasa, this could be reduced to a minimum. In this series there was no incidence of recanalization after the technique of folding the free ends of each vas upon itself was adopted. Recanalization is a failure of technique. The other failure that has to be borne in mind is one where the patient resumes intercourse without any any protection before a negative sperm count has been attained. Whilst this may be said to be a failure due to the patient it is also the duty of the surgeon to give careful and precise instructions to the patients before the operation. This is where the question of the pre-operative interview becomes very important. This is even more so in Malaysia where the procedure is relatively unknown and often misunderstood. Many males and some females still imagine that following vasectomy, the man would become feminised.

In the present series the complication rate is certainly very low. This is in agreement with results published by Livingstone 1971, Schmidt 1966 and Leader et al 1974. The long term complication rate is also minimal. The first patient in the series was done in 1970 and those done in that year have now had the operation performed for a period of 5 years. Whilst haematoma is a problem in many series it is found that careful attention to control bleeding at the site of operation can reduce, or prevent haematoma formation. In this series, there is one case of sperm granuloma. This is thought to be the result of an inflammatory reaction due to extravasated spermatozoa. The first description of such a complication was by Grunberg 1925. Thereafter Steinberg and Strauss 1947 collected three such cases from the literature.

Recanalization is the commonest cause of the failure of vasectomy to render a man sterile. Other causes include the ligation and section of a structure other than the vas e.g. a thrombosed testicular artery. However this is not common in the hands of trained surgeons. Studies started in late 1960 reported

failure rate of up to 4 percent (Pressar 1973). However the more recent studies show that the failure rate is less than 1 percent; Davis 1972, Gould 1974, Klapproth and Young 1973, Muangman 1974. The decline is probably due to improvement in the technique of vasectomy as is the case in this series. However it is essential that a candidate for vasectomy should know of this small percentage of failure before he submits himself to the operation. Marshall and Lyon 1953, reported an illustrative case, "... recanalization took place after a section of vas had been removed, the lumina had been coagulated with diathermy, and the ends ligated with silk after being turned back." The surgeon just cannot win in all the cases he operates on.

The possibility of the existence of a third vas, though not common must be considered in cases where the sperm count does not get to negative. Cases have been reported by Getze (1959) and Tuffill (1970) as mentioned by Wallace & Riddle (1971).

In all his enthusiasm to prevent recanalization, the surgeon must bear in mind a resolution passed at the second International Conference on Sterilization, Geneva, February 1973. "The operation must always be done bearing in mind the possible necessity for future reanastomosis should the patient re-marry, and it thus follows that a minimal amount of vas must be destroyed compatible with an effective operation"

Infection at the site of operation is a complication seen in less than 1 percent of vasectomy. In this series one patient had the operation site infected. This did not present any problem in management. Infection could also affect the vas itself, the epididymis and the testis. In this instance it is noted that the case of total gangrene following vasectomy was reported by Pryor et al (1971). The use of non-absorbable material to ligate the free ends of the vas can promote chronic and troublesome infection. Five deaths due to tetanus infection of the vasectomy site were reported amongst 62,000 men who had vasectomies done at the family welfare festival in India during 1971. This was published in the National Herald, Lucknow, India on April 3rd, 1972. Although the cause of the tetanus infection was not established there were circumstances which give rise to suspicion with regards to sterility when these procedures were carried out. However no record of death from tetanus has been reported in connection with vasectomies done under proper aseptic conditions. In many of these no routine antibiotic was given to the patients.

Other infections such as epididymitis and orchitis are not commonly seen. One of the most important factors that is worrying the Malaysian males as well as females, and for that matter other Asians, is whether the operation is going to lead the man into a state of femininity and sexual impotence. Basically this fear stems from the misconception that vasectomy is the same operation as castration. In controlled series as well as in animal experiments it has been shown that no significant side effects follow vasectomy. Where changes occur these were usually within normal limits and were not harmful. For example a 1973 study of 32 men one year after vasectomy reported no changes in the blood levels of sodium, potassium, chloride, carbon-dioxide, albumin, calcium, cholesterol, alkaline phosphatase, glucose, creatinine and bilirubin and no significant change in uric acid. This study was conducted at the Battelle Memorial Institute. Gregoire and Moran (1972 and 1973) found no significant change in either protein, fructose, lactic dehydrogenase or glucose-phosphate isomerase, in the seminal plasma of post-vasectomised patients. Studies conducted at the George Washington University Medical Centre by Derrick et al (1974) showed that there is a temporary suppression of spermatogenesis and an arrest of sperm maturation immediately following vasectomy. However, normal spermatogenesis soon resumes. There is also evidence to show that there is no change in the level of pituitary gonadotropins (F.S.H. - L.H.) or testosterone. (Smith et al 1974 and Speidel et al 1973).

Conclusion:

It is generally accepted that family planning is necessary in Malaysia as in many countries in the world. The backbone of family limitation is built around the condoms, the oral contraceptive pills and the intrauterine contraceptive devices. The condoms still carries a high rate of failure as experienced by the local population. Male and female sterilizations are essential for more reliable and permanent family limitation.

The experiences elsewhere and locally have shown that male sterilization is cheap and suitable for family limitation. It can be implemented in large campaigns such as the vasectomy camps in India. The complication rate is very low.

There is also an urgent need for the training of more doctors to provide this service to patients who need it. Studies should be intensified to develop a vas valve. If this reversibility can be assured the popularity of this simple procedure will increase.

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