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Simply modified no-scalpel vasectomy (percutaneous vasectomy) — a comparative study against the standard no-scalpel vasectomy

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Abstract

Background and Purpose: The simply modified no-scalpel vasectomy (SMNSV; percutaneous vasectomy) technique was reported to simplify the standard no-scalpel vasectomy (SNSV) procedure. In this report, we introduce our experiences with SMNSV in comparison with the SNSV.

Materials and Methods: Between July 1999 and June 2002, 417 men were prospectively randomized to be vasectomized at the Taipei Medical University Hospital: 215 acceptors underwent the SNSV and the remaining 202 received the SMNSV. Using the no-scalpel vasectomy instruments in a percutaneous fashion, the sharp no-scalpel hemostat punctures the skin directly instead of fixating the vas to the skin with the use of a ring clamp, as done in SNSV. The vas is then grasped with the ringed instrument instead of piercing the vas and performing the supination maneuver, as described for SNSV. The intraoperative conditions of each group were recorded. The postoperative pain and life conditions were self-reported. The pain level was assessed using a 10-cm visual analogue scale under various situations.

Results: The time required for the SMNSV technique was less than that for the SNSV technique ($p<.05$). There were no significant differences between the two groups with respect to incision length, postoperative pain, pain at coitus, time of return to work, time of resuming intercourse, self-reported satisfaction in sexual life, postoperative psychological status, postoperative body weight change and postoperative complications ($p>.05$ for all items).

Conclusions: The simply modified vasectomy technique simplifies the SNSV technique. It combines the minimally invasive nature of SNSV with the simplicity of classical vasectomy while conserving many comparable advantages.

Keywords: Standard no-scalpel vasectomy (SNSV); Simply modified no-scalpel vasectomy (SMNSV); Percutaneous vasectomy

1. Introduction

Vasectomy has been used for more than a century to ensure permanent male contraception. Much of the literature [1–5] indicates that many techniques have been used, and modifications are still being investigated with an aim of both simplifying the procedure and reducing complications.

Two procedures are commonly used to gain access to the vas: the conventional incision vasectomy (CIV) method and the more recent standard no-scalpel vasectomy (SNSV) technique [6]. Standard no-scalpel vasectomy involves no cutting of the skin of the scrotum, nor does it involve suturing. In additional, the time required to perform this procedure is much shorter than that for CIV. Hematomas, infections and complaints of mild to moderate scrotal pain were much less frequently reported by SNSV acceptors when compared with those who underwent the CIV procedure [7]. The SNSV acceptors reported having resumed intercourse earlier than those following CIV [8]. Some surgeons have complained that the SNSV technique is, in fact, more difficult to perform than the CIV technique [9].

In 2003, Jones [9] described a vasectomy method called the simply modified no-scalpel vasectomy (SMNSV; percutaneous vasectomy). During this same period, since 1999, we also started studies on SMNSV. In this report, we introduce our experience with SMNSV, which avoids the most difficult step of SNSV and has so far yielded comparatively satisfactory results.

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2. Materials and methods

2.1. Subjects

Between July 1999 and June 2002, 417 men were prospectively randomized to be vasectomized at the Taipei Medical University Hospital: 215 acceptors underwent the SNSV and the remaining 202 received the SMNSV (percutaneous vasectomy). There was no stratification before the randomization process. The acceptors had fathered at least one child and had consent from their spouse to receive the sterilization method. The comparative data for acceptors are listed in Table 1. All acceptors were told to return to the outpatient clinic if any problem occurred.

2.2. Intraoperation conditions

The intraoperative conditions of each group are shown in Table 2.

2.3. Definition and level for pain scale

The pain scale is shown in Table 3.

2.4. Questionnaire

In December 2002 (6–41 months after surgery; median, 23 months), a follow-up questionnaire that was approved by an institutional committee for human studies was mailed to all 417 acceptors after previously being contacted by a research secretary when they accepted the semen analysis results to confirm sterilization. Completed responses were received from 183 men (85%) in the SNSV group and 172 men (85.2%) in the SMNSV group. Postoperative pain, short-term life conditions, psychological or physical changes and complications, which were recorded by the research secretary, were confirmed by the follow-up questionnaires. The long-term life conditions (including frequency of sexual relations and the degree of satisfaction in postvasectomy sexual life) were self-reported in the follow-up questionnaires. The pain level was assessed using a 10-cm visual analogue scale under various situations.

2.5. A brief introductory review of the surgical techniques

2.5.1. Standard no-scalpel vasectomy

For the SNSV, two specialized instruments are required: an extracutaneous fixation-ring clamp and a dissecting clamp. Each vas deferens is digitally manipulated to a superficial position under the raphe. Lidocaine is injected into the skin and along the vas deferens, and the vas grasped with the fixation-ring clamp. With the dissecting clamp, the scrotal skin is pierced and the wound is dilated. The vas is then separated from surrounding structures and delivered through the puncture hole. A 1-cm segment of the vas is removed and both ends of the vas are ligated with the testicular end sealed in its sheath. The opposite vas deferens is fixed through the same puncture and treated similarly. The wound is not closed.

2.5.2. Simply modified no-scalpel vasectomy (percutaneous vasectomy)

For the SMNSV, the same two specialized instruments for SNSV are required: a fixation-ring clamp and a dissecting clamp. Each vas deferens is digitally manipulated to a superficial position under the raphe. Lidocaine is injected into the skin just along the target vas deferens. Instead of grasping the vas and scrotal skin with the fixation-ring clamp, the scrotal skin is pierced and the wound is directly dilated with the dissecting clamp. The vas is then separated from surrounding structures and the vas grasped with the fixation-ring clamp, then delivered through the puncture hole. A 1-cm segment of the vas is removed, both ends of the vas are ligated and the testicular end is sealed in its sheath. The opposite vas deferens is delivered through the same puncture and treated similarly. The wound is not closed.

2.6. Confirmation of sterilization

Sterilization was confirmed by quantitative semen analysis showing absence of sperm after 15 ejaculations postvasectomy.

2.7. Statistical analysis

All results were analyzed using the Mann–Whitney rank-sum test and the chi-square test. The confidence level with $p<.05$ was assigned to indicate significant differences.

Table 1
Comparative data of acceptors

	SNSV	SMNSV
Acceptors (*n*)	215	202
Mean age of acceptors [years (range)]	38.3 (26–57)	37.4 (28–55)
Mean children [*n* (range)]	2.5(1–4)	2.7(1–5)
Previous contraceptive methods (%)		
Oral pills	22	20
Condom	35	39
IUD	30	33
Withdrawal	13	8

Table 2
Intraoperative conditions

	SNSV	SMNSV	p
Average operation time (min)	15.2±3.5	11.7±2.0	<.05
Average incisional length (mm)	7.8±2.5	8.0±2.1	>.05
Wound closed with sutures (%)	1.2	1	>.05

Table 3
The definition and level for pain scale

Pain level	Scale status/Description
10	Disabling: acceptors always aware of the pain
8	Severe: acceptors unable to concentrate on their daily work
6	Moderate: acceptors able to continue some physical activity
4	Tolerable: pain somewhat ignored by the acceptors
2	Mild: acceptors always aware of mild pain
0	Pain-free: without any sensation of pain

3. Results

Significantly reduced average operation time is seen in Table 2; less time was required to perform SMNSV as compared with SNSV ($p<.05$). However, there were no significant differences between the two techniques with respect to average incisional length (Table 2). Only 1.2% of wounds in SNSV acceptors and 1% in SMNSV were closed with sutures; there was no significant difference (Table 2).

In addition, no significant differences were found between the two techniques from the self-reported results (Table 4), which included the postoperative pain conditions, pain at rest, pain at activity and pain at coitus ($p>.05$). Only 6% of acceptors experienced pain at activity after undergoing SMNSV, and no acceptors experienced pain at coitus after operation by either of the two techniques.

Most of the acceptors (86%) who underwent SMNSV resumed work on the day of operation, and nearly all acceptors (99%) resumed work within a week (Table 4).

Comparing the preoperative and postoperative satisfaction in sexual life, 96% of the acceptors in each group were satisfied with these techniques. In reality, no significant difference was noted between the two techniques (Table 4).

About 8% and 6% of acceptors in the SNSV and the SMNSV groups, respectively, experienced temporary irritable mood postoperatively, while 14% and 10% of acceptors experienced postoperative body weight changes, respectively, in each group (Table 4).

In addition, various postoperative complications, including hematomas, infections and granulomas, were experienced by a few acceptors in each group; there was no statistically significant difference for complications ($p>.05$; Table 4). The results indicate that the complication rate in the SMNSV group is similar to that of the SNSV group.

It is noteworthy that only one patient in each group experienced recanalization of vas after vasectomy; immediate salvage operations were performed successfully.

Table 4
Self-reported results after SNSV or SMNSV

	SNSV (%)	SMNSV (%)	p
Pain at rest	3	2	>.05
Pain at activity	7	6	>.05
Pain at coitus	0	0	–
Resumed work on day of operation	85	86	>.05
Resumed work within a week after operation	96	99	>.05
Resumed intercourse within a week after operation	64	68	>.05
Frequency of sexual relations same as before operation	84	87	>.05
Satisfaction in sexual life such as before operation	69	70	>.05
More satisfied in sexual life than before operation	27	26	>.05
Postoperative irritable mood	8	6	>.05
Postoperative body weight gain	5	5	–
Postoperative body weight loss	9	5	>.05
Hematoma	6	4	>.05
Infection	1	1	–
Granuloma	4	2	>.05

4. Discussion

Technically, the time required to do the procedure was shorter in the SMNSV group than in the SNSV group ($p<.05$). The percutaneous approach of the SMNSV method indeed seemed to make isolation of the vas much easier than that in the SNSV procedure. After injection of 1% plain lidocaine along the bilateral margins of the target vas, the paravasal spaces were more easily dissected because of pressure from the lidocaine infiltration. Hence, the paravasal spaces could be identified more clearly when proceeding with skin puncture and subcutaneous tissue dissection.

Since preoperative lidocaine infiltration can cause some pain and therefore affect descriptions of intraoperative pain when designing the questionnaires, the intraoperative pain scales were excluded from the pain level assessment to prevent possible confusion.

Data in Table 2 show that there was no significant difference in the incision lengths between the SMNSV and SNSV groups. This implies that the wound length resulting from SMNSV is as small as that from SNSV; meanwhile, the SMNSV is, in fact, a no-scalpel procedure.

Postoperative complications were self-reported by the patients, and no patient returned to the outpatient clinic with severe complications. In a report by Nirapathpongporn et al. [10], hemorrhage was the most common complication, with "2 patients requiring admission to the hospital for surgical drainage of large scrotal haematomas". In contrast, in this report, the list of complications included some minor or even ambiguous discomforts such as small subcutaneous hematomas that could be absorbed spontaneously without surgical drainage and temporary infections over the wound that could be easily treated with oral antibiotics. The complication rate of no-scalpel vasectomy in the above report appears to be surprisingly low (0.4/1000) [10], possibly because only severe complications that needed admission for further management were reported. In the present study, the complication rates of both no-scalpel vasectomy procedures were actually far lower than those obtained from a similar study by Skriver et al. [8].

Many failures from vasectomy have been attributed to recanalizations, most of which are caused by failure of the vas occlusion technique. Labrecque et al. [11] reported that thermal cautery, when combined with fascial interposition on the abdominal end, is much more occlusive than ligation with clips and excision of a small vas segment. Hence, the authors have successfully combined the two procedures. Only a single failure in each vasectomy group was observed.

The SNSV technique results in smaller wounds and fewer hematomas [12] compared with the CIV procedure [10]. However, surgeons are handicapped by the difficulty in skillfully learning the procedure. In contrast, the SMNSV technique [9] requires much simpler steps and skills compared with the SNSV technique.

Statistically, the SMNSV procedure is similar to the SNSV procedure in many respects such as a shortened duration before returning to daily work, greater satisfaction with postoperative sexual life and no significant postoperative body weight changes ($p > .05$). Data show that 86% of patients resume work the same day, with an average time of 0.8 days for returning to work. This is significantly shorter than the 2.5 days reported by Jones ($p < .05$) [9]. This difference may arise from the fact that almost all patients in Jones's group intentionally underwent the procedure immediately before a weekend or during vacation, resulting in a probable overestimation of the time required before return to work.

Moreover, as many as 96% of patients showed great satisfaction with their postoperative sexual life, indicating that sexual function is unaffected by the SMNSV treatment. By comparison, 8% and 6% of patients in the SNSV and SMNSV groups, respectively, experienced a temporary irritable mood due to anxiety about postvasectomy pain. This abnormal psychological status disappeared gradually after cessation of pain.

It was also found that 86% and 90% of patients in the SNSV and SMNSV groups, respectively, showed no evidence of body weight changes. Only about 5% reported weight gain. This finding strongly contradicts the traditional misunderstanding that a vasectomy may cause body weight gain.

5. Conclusion

In conclusion, the simply modified vasectomy technique eliminates a step in the SNSV. It combines the minimally invasive nature of no-scalpel vasectomy with the simplicity of classical vasectomy while conserving many comparable advantages.

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