Percutaneous No-Scalpel Vasectomy via One Puncture in China

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Purpose: To evaluate the efficacy and postoperative morbidity of percutaneous no-scalpel vasectomy (NSV) via one puncture in China.

Materials and Methods: A total of 150 men visiting outpatient clinic of the surgery department of urology, Huashan Hospital and its Baoshan branch of Fudan University, opted for percutaneous NSV with local anesthesia. The clinical data of 150 who underwent modified NSV (MNSV) were retrospectively compared with those of 120 patients who underwent standard NSV (SNSV). The results and follow-up were recorded.

Results: The reviewed average operative time was 9.8 min (range 8 to 20 min). Average incisional length was 5 mm (range 4 to 8 mm). Patients reported complete recovery in an average of 8.5 days (range 4 to 14 days). The complication rates were extremely low with this modified technique. Only one case of late healed incision was observed (0.67%).

Conclusion: Percutaneous NSV via one puncture was proved to be a painless and effective form of permanent contraception with an extremely low complication rate.

Keywords: vasectomy; adverse effects; methods; prospective studies; follow-up studies; surgical procedures; minimally invasive.

INTRODUCTION

Vasectomy is a simple and reliable method of male permanent contraception that has achieved widespread acceptance in the world. Various surgical approaches to occlude the vas have been recommended over the years, including the conventional incision vasectomy (CIV) through a 2 to 3 cm incision and the standard no-scalpel vasectomy (SNSV) made through a 2 to 3 mm puncture wound on the scrotum, both of which were first introduced from China and used in other countries.[1,2] NSV has been proved to be a minimally invasive approach, which reduces the incision size, procedure time, pain, bleeding and postoperative complications compared with CIV.[3-8] Yearly 16 million Chinese men undergo this procedure, which is traditionally performed through 1 or 2 standard scrotal incisions.[9] Some surgeons have complained that the SNSV technique is, in fact, more difficult to perform than the CIV technique.[10] Therefore, in this study, we reported a MNSV with only one tiny puncture in scrotum.

MATERIALS AND METHODS

A total of 150 men who have been undergone MNSV in our center were analyzed retrospectively compared with those 120 men who have had SNSV. There were no significant differences between these 2 groups in terms of age and mean number of children ($P > .05$). The characteristics of subjects are shown in Table. Those who agreed for vasectomy must sign an informed consent form and ensure the following: should have had at least one or more children, should have realized the risk of the possible complications and should have obtained the consent of their spouses to undergo the sterilization method. The exclusion criteria were subjects with testicular cancer, active scrotal skin infections, epididymitis, orchitis, balanitis and some other surgical contraindication. All vasectomies were performed by the responsible author and his assistant. Main outcome measures were the patients' characteristics, hospital stay, incisional length, recurrence rate, complication rate, operating duration and complication rate.

The surgical procedure was similar to percutaneous SNSV as reported by Li and colleagues.[1] The method for SNSV is illustrated in Figures 1-5. A few modifications were made as the following: the point of puncture was single to complete bilateral vasectomy and located on the scrotal surface at the median raphe approaching the root segment of penis; after puncturing through the scrotal skin, a dissecting forceps and two no-scalpel hemostats were used to isolate the vas scrupulously and the wound was closed by medical adhesive.

RESULTS

In the group of MNSV, the average operative time was 9.2 min from sterilizing the skin to closing the skin. Average incisional length was 5 mm. Patients reported complete recovery

Figure 1. Fixing one vas to the scrotal surface at the median raphe using the three-finger technique to stabilize the vas. Performing a local vasal nerve block using a needle injection with 1-2% lidocaine without epinephrine.

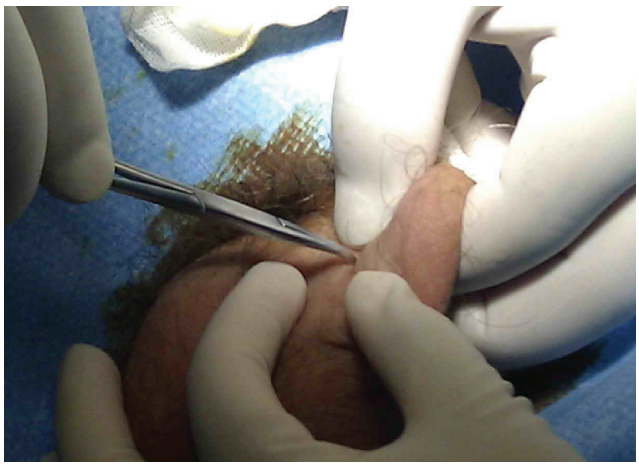

Figure 2. Sharpened no-scalpel hemostat pierces skin.

Figure 3. Spreading scrotal wall to expose vas.

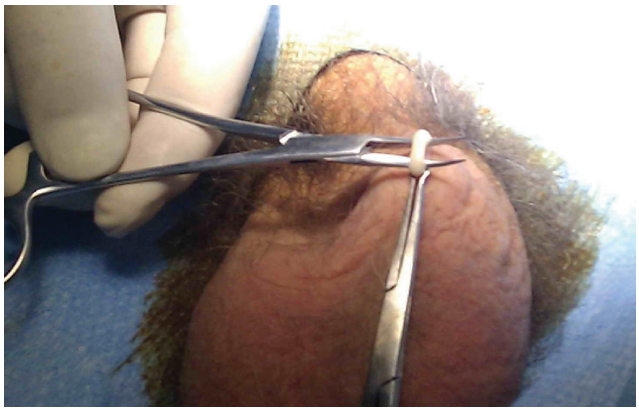

Figure 4. Ringed clamp is placed into incision to isolate and extract vas.

in an average of 8.0 days. The mean duration of follow-up was 6.5 months. Complete azoospermia was achieved in 100% of men 3 months postoperatively by at least two semen analyses. Most of the men (92%) resumed work on the same day and all (100%) resumed work within a week. The complication rates were extremely low: there was one diabetic patient with late healed incision without infection (0.67%). The wound did not heal within ten days postoperatively. By controlling his blood sugar with insulin, the wound healed later (Table).

DISCUSSION

NSV were first introduced from China and then used in other countries.[1,2] It has been demonstrated that it results in a smaller wound and shorter operation time compared to the CIV procedure, being the most reliable and the safest method currently available for male contraception.[11] Because of its minimally invasive nature more and more families in China also select NSV for contraception recently.

With twenty years passing away, there were numerous methods improving NSV. Owing to the initial needle puncture that is usually the commonest voiced concerns for the patient, a revolution of application of novel and actually painless anesthesia has made the procedure more comfortable. It was called no-needle jet injection or no-needle vasectomy. This technique used a special instrument that delivered via high pressure injector through tiny head to beneath skin and throughout tissue around vas achieving complete anesthetic block of the vas.[12] As a result of economy and technique aspect in China, this advanced and great anesthetic method has not been used in our study. At the aspect of surgical procedure, there were also some modifications of NSV.

Chen divided NSV into instrument-dependent no-scalpel vasectomy (IDNSV) which is publicly known and instrument-independent no-scalpel vasectomy (IINSV).[13] The main difference between them is two specialized instruments (an extracutaneous fixation-ring clamp and a dissecting clamp) which are required in the former. The IINSV technique offers an alternative option for vasectomists whenever the specific instruments of standard NSV are unavailable. Jones suggested a percutaneous vasectomy, which to avoid the most difficult step which is fixation of the vas to skin using the ring clamp.[10] The steep learning curve of NSV is well known. It was stated that 15 to 20 cases are required to develop proficiency

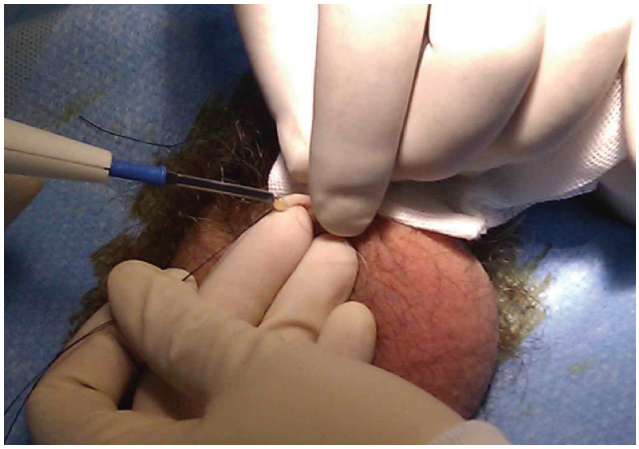

Figure 5. An 1 cm piece of vas is excised and the occlusion is accomplished by ligation and cautery of the lumen of both vasal ends.

Table. Outcome measures of studies comparing our study with others.

Study	Sample Size	Effectiveness				Complications no. (%)			
		Operation Time (min)	Incisional Length (mm)	Post-vasectomy Semen Analysis		Hematoma	Infection	Others	Total
				Timing	Failure Rate No. (%)				
Kumar et al. 1999[7]	4253	9.5	Not reported	3 months	Not reported	2 (0.047)	3 (0.07)	3 painful nodules (0.07) 2 vasal fistulae (0.047)	10 (0.2)
Labrecque et al. 2002[8]	3761	Not reported	Not reported	112 days	104 (2.8)	24 (0.64)	7 (0.19)	90 Vasitis/orchi-epididymitis (2.4) 20 granuloma (0.53) 2 other unspecified (0.05)	143 (3.8)
Jones, 2003[13]	573	9.3	8.4	2 to 4 weeks	1 (0.17)	Not reported	Not reported	Not reported	Not reported
Chen, 2004[12]	215	15.2	7.8	Not reported	1 (0.4)	6 (2.4)	1 (0.4)	4 granuloma (1.6)	11 (5)
Our study	150	9.2	5.0	3 months	0 (0.00)	0 (0.00)	0 (0.00)	1 late healed incision (0.67)	1 (0.67)

with the procedure even for experienced vasectomists.[1] This described simple modification maneuvers are mastered even by most junior residents within fewer than 10 cases. Numerous techniques for vasal occlusion have been developed and were used all over the world. These consisted of excision of a segment of vas of various lengths, ligation of the vas with either suture or clips, folding back the end of the vas onto itself, fascial interposition between the cut ends of the vas, and cautery of the lumen of the vas (electric or thermal).[8] Because of the heterogeneity of study designs, surgical technique used, and assessment of results, there was no evidence that some occlusion method was more effective in terms of contraception and associated with a lower risk of complications compared with any other occlusion method.[8] As a result, percutaneous IDNSV with some modification was used in our study.

The complication rates were low with NSV. The most common complications were infection and hematoma. Infection was very rare when NSV was performed under sterile conditions and was usually coexistent with an underlying hematoma.[3] It was well documented that incidence of complications was closely related to the experience of the physician.[4] The mean incidence of hematoma is less than 0.5%.[3,14]

In our study there was one (0.67%) diabetic patient with a late healed incision. This patient had poor diabetes mellitus control. Fasting blood sugar was 9 mmol/L. In order to control the glycemia, insulin was administered. The late healed incision was fully recovered later. In brief, diabetes mellitus and uncontrolled glycemia were the main reason for these complications. It warned that despite of a small incision, those who are in poor health condition could be aware of them. Some measures should be taken to improve it. Compared with other studies, the effectiveness and main outcome were accordant and seemed even better (Table).

In our opinion, this result was profited from some modifications of percutaneous NSV. A single puncture in scrotum to complete bilateral vasectomy can reduce the total incisional length. The point of puncture chosen on the scrotal surface at the median raphe approaching the root segment of penis can reserve a longer vas next to the epididymal end. This improvement can decrease tension of the epididymis after ligation. It can increase the contraception rate and relieve postoperative pain. A dissecting forceps and two no-scalpel hemostats were used to isolate the vas scrupulously. It can isolate the vas precisely without injuring the vessels of the vas and reduce the incidence of hematoma formation. The wound was closed by medical adhesive to prevent contamination with water and microorganisms. It helped to protect the inci-

sion against infection. Patients can even take shower on the day of operation.

CONCLUSION

We concluded that percutaneous NSV via one puncture is a virtually painless and extremely effective form of permanent contraception with an extremely low complication rate.

REFERENCES

1. Li SQ, Goldstein M, Zhu J, Huber D. The no-scalpel vasectomy. J Urol. 1991;145:341-4.
2. Huber D. No-scalpel vasectomy: the transfer of a refined surgical technique from China to other countries. Adv Contracept. 1989;5:217-8.
3. Schlegel PN AGM. Vasectomy. In: M G, M G.M Gs. Surgery of Male Infertility: New York, WB Saunders; 1995. p. 35-45.
4. Goldstein M. Surgical management of male infertility and other scrotal disorders. In: Walsh PC RAVE, Walsh PC RAVE. Walsh PC RAVEs. Campbell's Urology. 8thed: New York, WB Saunders; 2002. p. 1541-7.
5. Viladoms JM, Li PS. Vasectomia sin Bisturi. Arch Esp Urol. 1994;47:695-701.
6. Skriver M, Skovsgaard F, Miskowiak J. Conventional or Li vasectomy: a questionnaire study. Br J Urol. 1997;79:596-8.
7. Kumar V, Kaza RM, Singh I, Singhal S, Kumaran V. An evaluation of the no-scalpel vasectomy technique. BJU Int. 1999;83:283-4.
8. Labrecque M, Dufresne C, Barone MA, St-Hilaire K. Vasectomy surgical techniques: a systematic review. BMC Med. 2004;2:21.
9. Nian C, Xiaozhang L, Xiaofang P, Qing Y, Minxiang L. Factors influencing the declining trend of vasectomy in Sichuan, China. Southeast Asian J Trop Med Public Health. 2010;41:1008-20.
10. Jones JS. Percutaneous vasectomy: a simple modification eliminates the steep learning curve of no-scalpel vasectomy. J Urol. 2003;169:1434-6.
11. Liu X, Li S. Vasal sterilization in China. Contraception. 1993;48:255-65.
12. Weiss RS, Li PS. No-needle jet anesthetic technique for no-scalpel vasectomy. J Urol. 2005;173:1677-80.
13. Chen KC. A novel instrument-independent no-scalpel vasectomy - a comparative study against the standard instrument-dependent no-scalpel vasectomy. Int J Androl. 2004;27:222-7.
14. Kendrick JS, Gonzales B, Huber DH, Grubb GS, Rubin GL. Complications of vasectomies in the United States. J Fam Pract. 1987;25:245-8.