

## Standard Incision or No-Scalpel Vasectomy?

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**BACKGROUND.** For more than a decade a new method of vas deferens access, the no-scalpel vasectomy (NSV), has been promoted and publicized in the United States, Canada, and other countries and has gained remarkable acceptance. Supporters of NSVs claim fewer hematomas, less bleeding, fewer infections, shorter operating times, less pain, and an enhanced acceptance of vasectomy.

**METHODS.** The records of a series of 619 consecutive vasectomies performed by the same surgeon using both NSV and standard incision techniques were analyzed to compare the incidence of early complications in each.

**RESULTS.** The incidence of complications in the series of vasectomies was virtually the same whether NSV or a conventional method was used. Infections occurred in 0.7% of conventional procedures, compared with 0.6% in NSVs; hematomas occurred in 0.3% of both; and no incisional bleeding was seen after either procedure.

**CONCLUSIONS.** The claims made for NSV remain unsubstantiated. This study indicates that either a standard incision or the NSV method of accessing the vas deferens can yield similarly good results.

**KEY WORDS.** Vasectomy, no-scalpel; vasectomy, standard incision; complications. (*J Fam Pract* 1999; 48:719-721)

Following its 1986 introduction in the United States, no-scalpel vasectomy (NSV) has been promoted by the Association for Voluntary Surgical Contraception International (AVSC) and acclaimed in the lay press<sup>1</sup> as well as in the medical literature. Many vasectomy candidates now appear to be aware of the procedure, to believe in its superiority, and seek out its practitioners. We reviewed the claims and merits of NSV as described in the medical literature and describe here a comparative study of 619 vasectomies performed using both a conventional method or NSV. The difference between conventional and NSV procedures lies in the method of accessing the vas deferens and is described by Goldstein in a standard textbook of urology.<sup>2</sup> NSV proponents claim fewer hematomas, less bleeding, fewer infections, shorter operating times, less pain, and an enhanced acceptance of vasectomy.<sup>3</sup>

We are aware of only one previous paper that compares the incidence of complications in the 2 methods. In 1990 Nirapathongporn and colleagues reported a series of 1203 patients who had either a standard incision vasectomy or an NSV performed by one of 28 physicians during a festival in Thailand.<sup>4</sup> The results favored NSV, but definitions of complications were not given, and details of study populations and follow-up were sparse.

In 1991 Li and colleagues reported on a series of 273 NSVs performed in the United States, of which 35 patients were lost to follow-up. Complications, reported as non-existent, were not defined, and no description of data collec-

tion methods or the study population was given. However, supporting evidence in favor of NSV was offered through testimonials in an AVSC survey of some US surgeons and from an AVSC-sponsored focus group, whose size and characteristics were not mentioned. The same paper also briefly described the results of an unreferenced Chinese NSV series, as well as Nirapathongporn's Thai series. A 1998 paper by Reynolds reported complications in a series of 225 NSVs performed in a teaching environment in Canada.<sup>5</sup> We found other papers about NSV in the literature, but they are merely descriptions of the technique and laudatory testimonials by its users.<sup>6,7</sup> We could find no comparative studies that addressed the questions of operating times for each type of procedure, the amount of pain experienced by the patient, and any effect of patient's fear of the scalpel.

Our paper reports the practice experience of one of the authors (GECM), who performed 619 vasectomies between June 28, 1997, and October 31, 1998, of which 336 (54.3%) were NSVs and 283 (45.7%) were by standard incision. All of the early vasectomies in this series were performed by the standard incision method, but the change was made to NSV as demand grew. As is acknowledged by Li and Goldstein,<sup>3</sup> the disadvantage of the NSV technique is in the number of procedures it is necessary to perform to gain proficiency. Thus, some of the operations in this series were initially attempted as NSVs but ended as standard incision procedures.

### METHODS

#### STUDY POPULATION

In our study nearly all patients were residents of the greater Vancouver, Canada, area, where vasectomy is cov-

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ered by a universal health plan. Most men were married or in a relationship, had children, and had been referred by their physicians. The patients were of diverse ethnicity, predominantly white, with a mean age of 37.9 years. The group included a wide variety of occupations; professionals were especially well represented.

### DEFINITIONS OF COMPLICATIONS

We used the following terms to determine the prevalence of complications after the procedures:

**Epididymitis.** Epididymitis had its onset within a few days of surgery, usually after a trouble-free interval. The pain was most often unilateral and associated with distention and tenderness of the epididymis. It tended to improve in a short time with or without nonsteroidal anti-inflammatory drugs (NSAIDs).

**Infections.** Infections began within a few days of surgery and were usually characterized by pain with notable tenderness and swelling at one vasectomy site and encroachment on adjacent tissues. Infections were not relieved by NSAIDs, but responded well to antibiotics. In our study, no infections suppurated and no wound infections were seen. If antibiotics were prescribed, the problem was classified as an infection, as has been done in other studies.<sup>9</sup>

**Hematomas.** Hematomas developed within 24 hours of the vasectomy and were characterized by swelling and tenderness at the vasectomy site. Hematomas demonstrate massive scrotal swelling, gross ecchymosis, considerable pain, and the likelihood of prolonged incapacity.

**Incisional bleeding.** Bleeding that requires medical attention may occur in the immediate postoperative period.

**Seroma.** Seroma presented as swelling and discomfort related to a postoperative accumulation of fluid at the vasectomy site, as demonstrated by transillumination and no stigmata of infection.

### ASSESSMENT OF COMPLICATIONS

We assumed that bleeding and infection were related to intraoperative factors and events that occurred somewhat later (eg, sperm granuloma and failure) were related to the manner in which the vas ends had been treated. Thus, adverse events occurring within 14 days of surgery (ie, short-term complications) were attributed to the method of accessing the vas (standard incision or NSV), and those occurring after 14 days were attributed to the treatment of the vas itself. Complications were categorized as "minor" if they required less than 3 days off work, "major" if 3 or more days were needed.

Our methods and locale have been previously described in an earlier paper.<sup>10</sup> Briefly, all conventional vasectomies were performed in the physician's office under local anesthesia using sterile technique, absorbable sutures for vas occlusion and hemostasis,

and (mostly) disposable materials. Since the earlier series we have adopted 2 significant changes in technique: sterile disposable needles have replaced reusable "pick-up" needles to fill glass syringes with anesthetic, and electrocautery is now used for both hemostasis and vas occlusion. Our study includes all of the cases in which electrocautery was used.

A health history was elicited from all patients, and a local physical examination was conducted before surgery. The earlier patients underwent the conventional method; the later patients received NSV, except when the procedure was technically difficult. In those cases the conventional method was used. Where NSV was attempted, more than 90% were completed. Patients were not randomized; they did not, however, generally know which method was used.

The surgical techniques used were the same as described in a standard textbook of urology.<sup>2</sup> For both procedures, patient preparation and local anesthesia (vas block with 1% lidocaine with epinephrine) were the same. If the patient was very anxious, or prone to vasovagal responses according to his history, he was premedicated with 2 mg sublingual lorazepam.

For the conventional method a single small transverse midline incision was made through which the vas was secured and delivered by a towel clip. The sheath was incised, then separated from the vas by blunt dissection to expose at least 3 cm. Hemostasis by electrocautery was meticulous, though plain catgut sutures were required in a few cases.

For both the conventional vasectomies and the NSVs a 2- to 3-cm section of vas was excised and sealed by electrocautery to a depth of approximately 5 mm. In no case was skin closure required. After surgery, all men were urged to contact the surgeon if problems occurred, and those patients were seen expeditiously. Follow-up semen tests were performed by the surgeon himself, at which time all patients were routinely asked about adverse events. All complications were recorded.

## RESULTS

In the 619 vasectomies, 25 short-term complications were seen (4%), almost equally distributed between standard incision vasectomies and NSVs. The most common complication was epididymitis (2.8% in standard incision vasectomy, 3% in NSV) followed by infections (0.7% vs 0.6%) and minor hematomas (0.3% in each). The complications in the 2 groups were compared using the binomial method, which is appropriate for categorical data with a large population and small frequencies.<sup>11</sup> The normal approximation to the distribution was suitable as both  $n\pi$  and  $n(1-\pi)$  exceeded 5 for each group. At the 95% confidence interval there was no difference in the complication rate between the 2 groups (Table). There were no major hematomas, incisional bleeding, or major complications in either the NSV or the conventional vasectomy group.



TABLE

## Complications in and Standard Incision Vasectomies

Complication	Incision* no. (%)	NSV† no. (%)
Epididymitis	8 (2.8)	10 (3.0)
Infections (minor)	2 (0.7)	2 (0.6)
Hematoma (minor)	1 (0.3)	1 (0.3)
Incisional bleeding	0	0
Seroma	1 (0.3)	0 (0)
Total	12 (4.2)	13 (3.9)

\*N = 283.

†N = 336.

## DISCUSSION

Short-term complication rates in other series of conventional vasectomies have varied widely. Kendrick et al<sup>12</sup> reported an infection rate more than 5 times that seen in our series and a hematoma rate some 6 times greater. Schmidt,<sup>13</sup> in a series of 6248 cases, prescribed antibiotics 4 times more often than we did, but had the same percentage of hematomas (0.3%). Philp et al<sup>14</sup> showed an estimated 1.3% infection rate in a very large series—twice the infection rate of our study—and 0.9% hematomas, which is 3 times as many as in our results. Reynolds,<sup>5</sup> an experienced clinician in the use of NSV, had an infection rate only slightly greater than ours, but his hematoma rate was 7 times greater.

In this present study we found virtually no difference in the short-term complication rates between NSV and a conventional method of vasectomy (Table). Although operating times and pain during or following the procedures were not studied, some observations may be made. In our practice, the adoption of the NSV has not allowed us to shorten our appointment schedule. Vas accessibility, adherence of the sheath, and attention to hemostasis are important considerations. Most patients tolerated the procedure well irrespective of the method used. Our impression was that the apprehension of the patient and the adequacy of local anesthesia were more likely to determine the discomfort level than the operative technique.

Data collected by the AVSC and other organizations for a 1998 article indicated that 494,000 vasectomies were performed in the United States in 1955.<sup>15</sup> This same article makes reference to a previous paper which estimates that "half a million" men had had a vasectomy in the States in 1991—4 years earlier.<sup>16</sup> These data do not indicate that NSV has led to a greater acceptance of male sterilization. In British Columbia, where accurate records for vasectomies are available, there were 7847 procedures performed in 1993 and 7892 in 1997.<sup>17</sup> Adjusting for population increases there has actually been a proportionate decrease in vasectomies.

## CONCLUSIONS

In the 13 years since its US debut, proponents and practitioners of NSV have failed to provide the peer-reviewed medical literature with convincing evidence of its superiority. It seems possible that the introduction of this novel and seemingly less threatening method of vasectomy to the United States and elsewhere may have been embraced with more enthusiasm than detachment. If one assumes, however, that a technique should be judged largely by its complications, the results of this study suggest there is little difference between NSV and standard incision methods. It follows that experienced clinicians need not change to a technically more difficult procedure. We believe that a satisfactory vasectomy can be achieved when either technique is meticulously executed by an experienced physician.

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