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No-scalpel vasectomy as performed by a general practitioner/surgeon between 1990 and 1999

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Background: Compared to the relatively large incision required to expose the vas in the traditional vasectomy, the no-scalpel technique involves a small puncture. This paper describes one general practitioner/surgeon's experience performing the no-scalpel vasectomy (NSV) over a 10-year period in an office practice in Banff, Alberta.

Methods: Data were collected on men who had an NSV between October 1990 and December 1999. Sociodemographic information and surgical complications were recorded at the time of the procedure, which was carried out in either the physician's office or at a rural hospital. Follow-up information was gathered by examination, by telephone, or by contact with the patient's own doctor.

Results: Sample mean age was 37 years. A total of 666 vasectomies were performed, 662 using the no-scalpel technique. Six hundred and thirty-three NSVs were performed in the physician's office, and 29 were performed in the hospital. Complications included hematoma (0.7%) infections (1.6%), epididymitis (5.1%) and granuloma (2.2%). There were 5 known failures. Forty-two percent of the patients failed to have post-vasectomy checks for azoospermia. Noncompliance with this follow-up was associated with older age and lower occupational class.

Conclusions: NSV is an effective method of delivering the vas deferens and is easily performed by the physician in an office setting. It provides a safe and simple contraceptive option with few complications.

Contexte : Comparativement à l'incision relativement importante qu'il faut pratiquer afin d'exposer le canal pour effectuer une vasectomie traditionnelle, la technique sans scalpel nécessite une perforation minuscule. Ce document décrit l'expérience d'un omnipraticien–chirurgien ayant pratiqué pendant dix ans la vasectomie sans scalpel (VSS) dans un cabinet de médecin à Banff (Alberta).

Méthodes : On a recueilli des données sur des hommes qui ont subi une VSS entre octobre 1990 et décembre 1999. Les données sociodémographiques et les complications chirurgicales ont été consignées au moment de l'intervention, qui a été réalisée dans le cabinet du médecin ou à un hôpital rural. On a réuni de l'information de suivi au cours d'un examen, par téléphone ou en communiquant avec le médecin même du patient.

Résultats : Les sujets du groupe échantillon avaient en moyenne 37 ans. On a pratiqué au total 666 vasectomies, dont 662 au moyen de la technique sans scalpel. Six cent trente-trois VSS ont été pratiquées dans le cabinet du médecin et 29, à l'hôpital. Les complications ont inclus l'apparition d'un hématome (0,7 %), une infection (1,6 %), une épididymite (5,1 %) et un granulome (2,2 %). Il y a eu cinq échecs reconnus. Quarante-deux pour cent des patients n'ont pas fait vérifier leur azoospermie après la vasectomie. On a établi un lien entre l'inobservation de ce suivi, l'âge plus avancé et la catégorie professionnelle moins élevée.

Conclusions : La VSS est une façon efficace de dégager le canal déférent et elle est facile à exécuter par le médecin en cabinet. Il s'agit d'une méthode anticonceptionnelle sans danger et simple entraînant peu de complications.

Contents

Introduction

While oral contraceptives are a very popular method of contraception in Canada, recent reports indicate that male sterilization is on the rise.[1] One reason for this trend may be the increasing acceptability of the no-scalpel

vasectomy (NSV) to both patients and practitioners alike.[2,3] The NSV was developed in China by Dr. Li Shunqiang in 1974 with the intent of improving acceptance of vasectomy as a permanent contraceptive choice for men in that country.[4] It was introduced to other countries in 1986.[5] The no-scalpel technique has been described as somewhat more difficult to learn and as demanding a higher skill level relative to the traditional method.[5,6] However, advantages frequently attributed to the technique include fewer surgical and post-surgical complications, decreased operating and recovery times and avoidance of the usual surgical incision.[7]

The purpose of this paper is to describe the complications experienced by the NSV patients of a rural general practitioner/surgeon over a 10-year period. Sociodemographic factors associated with compliance at post-vasectomy semen checks are also examined.

Contents

Methods

The first author (I.R.M.) is a member of a group practice in the rural setting of Banff, Alberta. This practice serves approximately 12 000 patients, both from Banff and outlying areas. In addition to general family medicine services offered by the clinic, this author performs a wide range of general surgical procedures (e.g., appendectomies, varicose vein surgery, laparoscopic tubal ligation). Between October 1990 and December 1999, 666 vasectomies were performed. The majority of these were done in the office setting.

Procedure

Prior to the procedure, patients were given a comprehensive information package outlining the procedure, possible complications and after-care.

The main difference between the traditional vasectomy method and the NSV is the way in which the vas is delivered. This latter method has been described in detail by many authors.[5,8,9] In brief, following appropriate anesthesia, the vas is isolated and grasped through the scrotal skin using an extracutaneous vas

fixation clamp. The skin and underlying tissue are then punctured down to the vas, using dissecting forceps. The vas is skewered and manoeuvred out of the wound. At this point the vas is occluded in the physician's preferred manner, and the 2 ends are repositioned back into the scrotum. The procedure is repeated with the second vas using the same puncture site. Usually, no skin suture is required.

Local anesthetic or a para vasal nerve block is used. After 1.0 cm of the vas is excised, the ends are sealed with diathermy to a depth of 2.0 cm.

Post procedure

Patients were strongly encouraged to contact the physician if they experienced any problems after the procedure. They were advised to use other forms of contraception for their next 25 ejaculations and to have a semen analysis before resuming unprotected intercourse.

Sociodemographic information

Information on the patients' sociodemographic characteristics (age, marital status, occupational class, number of children) was collected at the time of their procedure. Information on complications (hematoma, infection, epididymitis, granuloma) and follow-up checks was collected by examination or by telephone, or by contact with the patients' doctors.

Complications

Hematoma

A mass near the vasectomy site, or bleeding causing a swelling under the wound in the scrotum. Onset within 24 hours of surgery.

Infection

Localized inflammation and tenderness with erythema or discharge. Onset within a few days of surgery.

Epididymitis

An inflammation of the epididymis involving all or most of that structure and principally that structure. Onset variable.

Spermatic granuloma

A persistent, hard, well-defined nodule. Onset 14–21 days after surgery.

Failure

Live sperm present in the semen analysis at follow-up.

Results

Of the 666 vasectomies performed, 662 were done using the no-scalpel technique. Due to problems isolating the vas, 4 were performed using the traditional, incisional technique. Of the 662 procedures, 29 were performed in the hospital. This was primarily due to this subset of men being extremely nervous and requiring sedation intravenously, or to the men having other surgeries performed at the same time. Mean age of the men was 37 years (standard deviation [SD] = 6; range 22–58 years). Of the 637 men for whom there was marital data, most were married or common-law (n = 590; 93%), 27 (4%) were divorced or separated and 20 (3%) were single. On average the men had 2 children (SD = 1; range 0–9). Of the 647 men for whom there was occupational data, 97 men (15%) were in professional occupations, 215 (33%) managerial or technical, 171 (27%) skilled, 92 (14%) partly skilled and 72 (11%) unskilled. Occupational classifications were based on a system used in the UK.[10]

One hundred and thirteen men (17%) had been referred by physicians and 544 (82%) were self-referred, having heard about the procedure through family or friends (n = 367; 55%) or media (n = 177; 27%). The source of 9 men is unknown.

The author began offering the NSV procedure late in 1990. The median number

of NSVs performed per year from 1991–1999 was 71 (interquartile range [IQR] 51–82).

Follow-up data on complications for the NSV group (n = 662) was available for 548 men (83%). These are summarized in Table 1.

Data for follow-up sperm checks was available for 527 (79%) NSV patients. Forty-two percent (220/527) of these patients refused or failed to comply with the recommended post-vasectomy checks for azoospermia. Factors associated with not having a follow-up included greater mean age ($p < 0.01$) and lower occupational class (skilled, partially skilled or unskilled vs. professional, managerial or technical; $p = 0.02$). Marital status and number of children were not significantly associated with having a follow-up sperm check.

Discussion

Several studies have reported on complications associated with the NSV,[2–4,11–17] however, there is substantial variation in the way in which such complications were defined, the manner in which they were assessed and the time period for which they were recorded. It has been suggested that only certain complications arising shortly after the procedure may be attributed to the method of accessing the vas (e.g., infection, bleeding, hematoma) while complications occurring later (e.g., epididymitis, sperm granuloma, failure) are more likely due to the manner in which the vas ends are treated.[12,18]

Complication rates for infection and hematoma appear to be the most consistently reported across studies of NSV. Hematoma rates have varied from 0% to 2.2% and infection rates have varied from 0% to 0.91%.[3,4,13,14] Overall complication rates, which have included sperm granulomas, epididymitis, "painful nodules" and vasal fistula, have ranged from 0.002% to 4.4%.[3,12,13]

Consistent with previous reports, the NSV procedure employed in this practice resulted in successful sterilization for the majority of patients. Complication rates for hematoma or infection were similar to previously reported rates for

NSV[3,4,13,14] and compare favourably to rates associated with the traditional method.[19] Complication rates for epididymitis, granuloma and failure are consistent to those reported for vasectomies regardless of the method of vas access used.[18,19]

One of the main difficulties encountered with the NSV is isolation of the vas.[5,7] Sokal and colleagues reported problems in 8.1% of NSVs compared to 4.6% of cases using the traditional method.[11] Although difficulty locating the vas has been reported for this technique, less than 1% of procedures had to be converted to open traditional vasectomy for this reason in this series.[11] It is noteworthy that in the current series, all 4 men in whom this difficulty was observed were markedly obese.

A few studies have compared the incidence of complications and adverse effects following the NSV to those following the traditional incisional method.[2,11,12,15–17] Regardless of the study design, across investigations that have compared the significance of the differences, the NSV has either compared favourably to the traditional method[2,10,16,17] or there has been virtually no difference in the incidence of adverse effects between the 2 techniques,[11,12,17] depending on the outcome assessed. Three of the studies reporting superior outcomes for NSV reported fewer infections[11,16,17] and 2 reported fewer hematomas.[11,16]

Martinez-Manautou and coworkers reported on the introduction of the NSV at the Mexican Social Security Institute.[15] Although they did not assess the significance of the differences in complication rates between the 2 techniques, the trend overall was for more complications to be associated with the traditional technique (28.1% vs. 15.5%). In their report, slightly more pain (8.7% vs. 8.3%) and "other" complications (3.5% vs. 1.6%) were associated with the NSV. The definition of "other" complications is unknown. The authors stated the complications observed with the no-scalpel technique would be reduced as there are always more complications in the early phase of training of a surgical technique.

Finally, the success of a vasectomy is assessed on the basis of post-vasectomy semen analysis to confirm azoospermia. Noncompliance with this follow-up procedure in men who have undergone NSV has varied between 15% and 50%.[3,11,14] It is disconcerting that 42% of patients in this study, for whom follow-up data were available, failed to have post-vasectomy checks for

azoospermia. Previously, noncompliance was found to be associated with family income and a similar association was found with occupational class in the present series. Compliance with semen analysis has been positively associated with years of marriage and family income.[14] It has been suggested that noncompliance may be associated with embarrassment at providing a specimen.[3] Alternatively, this may be due to patients perceiving the risk of surgical failure or of a subsequent pregnancy to be low.

Strengths of the present series include the fact that the same physician conducted all surgeries and that complication rates were based on actual follow-up contact with the patients or their doctors. This study is limited by the fact that the follow-up did not necessarily include a physical exam and thus the description of problems encountered may have been misclassified. Moreover, follow-up with the series was not complete, and this may have resulted in an underestimate of the complication rates. Similarly, the low compliance with post-vasectomy sperm counts may have resulted in an underestimate of the failure rate.

Supervised, hands-on training is recommended for learning this procedure. It has been recommended that physicians who already perform vasectomies need to complete 5 to 10 NSVs to become comfortable with the technique and those without such experience need to complete 10 to 15 procedures to become competent.[3] Reading, viewing instructional videos and attending education sessions would also assist in learning the procedure.[3]

Conclusion

The results of this study provide further evidence demonstrating that the NSV is a safe and effective method of permanent contraception and is easily performed in an office setting. This is of particular value to the rural patient whose access to such minor surgical procedures may otherwise be limited to large centres. Further evaluation of the procedure, including comparison to the incisional method, in controlled trials and economic assessment may serve to further establish NSV as the method of choice for the vasectomy procedure.

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Contents

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