

Original Article

A Male Surgical Contraceptive Method Based on Recommendations and Techniques Used in Vasectomy

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Conflict of Interest: None.

Binish A., et al. (2024). 4(2): DOI: <https://doi.org/10.61919/jhrr.v4i2.940>

ABSTRACT

Background: Vasectomy is a well-established method of male sterilization, offering a reliable and permanent contraceptive solution. Despite its effectiveness, the procedure remains underutilized due to limited counseling and awareness among patients.

Objective: The objective of this study was to evaluate the efficacy and safety of a standardized vasectomy technique based on the 2012 American Urological Association (AUA) guidelines and to identify factors influencing postoperative outcomes and patient satisfaction.

Methods: This prospective cohort study was conducted at the Department of Zoology, Rawalpindi Women University, from January 2022 to December 2023. A total of 150 male patients aged 25 to 50 years seeking permanent contraception were enrolled. Preoperative evaluations included detailed medical history, physical examination, and baseline semen analysis. The vasectomy procedures involved isolation, division, and management of the vasal ends using techniques such as proximal fascial interposition and thermal luminal fulguration. Postoperative care included instructions on scrotal support, avoidance of strenuous activities, and use of alternative contraception until azoospermia was confirmed through post-vasectomy semen analysis (PVSA) conducted at three months post-procedure. Data were analyzed using SPSS version 25, with statistical significance set at $p < 0.05$.

Results: The mean age of participants was 37.5 years (range: 25-50 years). The overall efficacy rate was 98.7%, with 140 participants (93.3%) achieving azoospermia and 8 participants (5.3%) having less than 100,000 non-motile sperm/mL at three months post-procedure. Complications included infection (1.3%), hematoma (2.0%), chronic pain (2.7%), and sperm granuloma (0.7%). The mean VAS scores for pain were 2.3 at one week, 1.1 at one month, and 0.5 at three months post-procedure. Patient satisfaction was high, with 95% of participants reporting satisfaction with the procedure.

Conclusion: This study demonstrated that vasectomy, when performed using standardized techniques, is a highly effective and safe method of male sterilization with high patient satisfaction and low complication rates. Enhanced preoperative counseling and follow-up are essential to optimize outcomes and increase the utilization of vasectomy as a contraceptive method.

Keywords: Vasectomy, male sterilization, contraceptive methods, postoperative outcomes, patient satisfaction, azoospermia.

INTRODUCTION

Vasectomy, a surgical procedure for male sterilization, has evolved significantly since its inception in 1899 when it was first performed on a prisoner as a treatment for frequent masturbation. Initially intended to address lower urinary tract issues and later proposed as a rejuvenation method for fatigued men, vasectomy's role as a reliable sterilization method was established after the confirmation of successful sterilization through semen analysis (1). It took another decade for surgeon William Belfield to advocate vasectomy as a family planning option, providing an alternative to illegal abortions (Sheynkin, 2009). Today, vasectomy stands as the sole recognized male contraceptive technique other than condoms, offering a well-established form of sterilization (2-4).

The 2012 American Urological Association (AUA) guidelines provide a comprehensive framework for vasal occlusion, post-procedural patient care, and counseling, aimed at optimizing vasectomy's efficacy and patient experience (5). Despite its advantages, vasectomy remains underutilized as a contraceptive method, with significant gender disparities in contraceptive counseling. Research involving 37 couples from a family practice highlighted that female partners often received extensive counseling on female sterilization, while discussions regarding vasectomy were minimal. Men reported receiving little to no family planning counseling, a trend corroborated

by insurance claim data from 2007 to 2015, revealing that only 0.78% of males considered vasectomy (6). Between 2015 and 2017, the National Survey of Family Growth indicated that 21.5% of women aged 15 to 49 relied on female sterilization, compared to 14.7% of men opting for vasectomy (7-10).

The underutilization of vasectomy underscores the necessity for healthcare providers, including primary care physicians and gynecologists, to be well-informed about the procedure and to discuss it as a viable contraceptive option with patients of all genders and ages. This is particularly important given that men can father children at any age, and assumptions about a partner's reproductive status should not preclude discussions about male sterilization. The AUA guidelines emphasize that vasectomy is less complicated, safer, quicker, and more cost-effective than tubal ligation, with most procedures performed in office settings, minimizing disruption to patients' daily lives (11-12).

Pre-vasectomy counseling is crucial and should be conducted face-to-face, as recommended by the AUA. This allows for a physical examination to confirm the presence of the vas deferens and assess the feasibility of performing the procedure in an office setting without the need for sedation or anesthesia in an operating room. The COVID-19 pandemic has necessitated adaptations in healthcare delivery, yet the importance of in-person counseling and examination for vasectomy remains paramount. Completing the mandatory consent form for Medicaid patients, which must be signed 30 to 180 days before the procedure, also necessitates an in-person visit (13-17).

In summary, vasectomy is a dependable method of male sterilization, yet it remains underutilized due to inadequate counseling and awareness. Enhanced education and discussion among healthcare providers and patients are essential to increase the acceptance and utilization of vasectomy. The 2012 AUA guidelines provide detailed recommendations for effective vasal occlusion and patient care, highlighting the procedure's benefits and the need for thorough preoperative counseling and postoperative follow-up. By addressing these gaps, vasectomy can become a more widely accepted and utilized method of contraception, contributing to more balanced family planning practices (18-20).

MATERIAL AND METHODS

The study aimed to evaluate the efficacy and outcomes of a male surgical contraceptive method based on recommendations and techniques used in vasectomy. This was a prospective cohort study conducted at the Department of Zoology, Rawalpindi Women University, from January 2022 to December 2023. Ethical approval was obtained from the Institutional Review Board of Rawalpindi Women University, and all procedures adhered to the principles outlined in the Declaration of Helsinki (21).

Participants included male patients aged 25 to 50 years who were seeking permanent contraception and had opted for vasectomy. Inclusion criteria required participants to be in good general health, without any significant comorbid conditions, and to have provided informed consent. Exclusion criteria included individuals with a history of urological disorders, prior scrotal surgeries, or known hypersensitivity to anesthetics used during the procedure.

Data collection involved comprehensive preoperative and postoperative assessments. Preoperative evaluations included detailed medical history, physical examination, and baseline semen analysis. Participants were counseled on the nature of the procedure, potential risks, and expected outcomes. They were informed about the permanency of the procedure, the possibility of reversal, and the limitations and success rates associated with reversal techniques (9). Written informed consent was obtained from all participants before enrollment.

The vasectomy procedures were performed by experienced urologists using standardized techniques as per the 2012 AUA guidelines. The procedures involved the isolation of the vas deferens, its division, and the application of methods to manage the vasal ends, such as proximal fascial interposition and thermal luminal fulguration. A segment of at least 15 mm of the vas deferens was removed to minimize the risk of recanalization. The use of surgical clips and cauterization was employed to ensure effective occlusion of the vasal ends (10-13).

Postoperative care included instructions on scrotal support, application of ice packs, and avoidance of strenuous activities and ejaculation for at least one week. Participants were advised to use alternative contraception until azoospermia was confirmed through post-vasectomy semen analysis (PVSA). PVSA was conducted at three months post-procedure, and sterility was defined as azoospermia or the presence of less than 100,000 non-motile sperm per milliliter of ejaculate (10-12).

Follow-up visits were scheduled at one week, one month, and three months post-vasectomy. At each visit, participants were assessed for complications, such as infection, hematoma, chronic pain, and sperm granuloma. Pain was evaluated using a visual analog scale (VAS), and any adverse events were recorded and managed accordingly.

Data were analyzed using SPSS version 25. Descriptive statistics were used to summarize demographic data, procedural details, and outcomes. The efficacy of the vasectomy procedure was evaluated by calculating the proportion of participants achieving azoospermia at the three-month follow-up. Complication rates and the incidence of adverse events were also calculated.

Comparative analyses were performed using chi-square tests for categorical variables and t-tests for continuous variables, with a significance level set at $p < 0.05$ (18-22).

This study adhered to rigorous ethical standards and methodological approaches to ensure the validity and reliability of the findings. By following the established guidelines and incorporating comprehensive data collection and analysis methods, the study aimed to contribute valuable insights into the effectiveness and safety of vasectomy as a male contraceptive method.

RESULTS

A total of 150 male patients were enrolled in the study, with a mean age of 37.5 years (range: 25-50 years). All participants successfully underwent vasectomy, and no major intraoperative complications were reported.

Table 1: Demographic and Clinical Characteristics

Characteristic	Value
Number of participants	150
Mean age (years)	37.5
Age range (years)	25-50
Baseline semen analysis (sperm count/mL)	Normal range

Follow-up data were available for all participants at one week, one month, and three months post-vasectomy. The incidence of postoperative complications and their management is summarized in the table below.

Table 2: Postoperative Follow-up and Complications

Complication	Number of Cases (%)	Management
Infection	2 (1.3%)	Antibiotic therapy
Hematoma	3 (2.0%)	Conservative management
Chronic pain	4 (2.7%)	NSAIDs, scrotal support
Sperm granuloma	1 (0.7%)	Surgical excision
Other	0 (0%)	Not applicable

Table 3: Post-Vasectomy Semen Analysis (PVSA)

PVSA was conducted at three months post-procedure for all participants. The results are presented in the table below.

PVSA Results	Number of Cases (%)
Azoospermia	140 (93.3%)
< 100,000 non-motile sperm/mL	8 (5.3%)
> 100,000 sperm/mL	2 (1.3%)

Table 4: Statistical Analysis

The mean time to achieve azoospermia was 12 weeks. The overall efficacy rate of the vasectomy procedure was 98.7%, as determined by the percentage of participants achieving azoospermia or having less than 100,000 non-motile sperm/mL at three months post-procedure.

Outcome	Number of Cases (%)
Efficacy (Azoospermia or < 100,000 non-motile sperm/mL)	148 (98.7%)
Failure (> 100,000 sperm/mL)	2 (1.3%)

Table 5: Pain and Patient Satisfaction

Pain was assessed using a visual analog scale (VAS) at each follow-up visit. The mean VAS scores are summarized below.

Follow-up Timepoint	Mean VAS Score (Range)
One week	2.3 (0-6)
One month	1.1 (0-4)
Three months	0.5 (0-2)

Patient satisfaction was high, with 95% of participants reporting satisfaction with the procedure and willingness to recommend it to others. The vasectomy procedure demonstrated high efficacy and safety, with a low incidence of complications and high patient satisfaction. The results underscore the effectiveness of standardized vasectomy techniques in achieving reliable male sterilization.

DISCUSSION

The findings of this study indicate that vasectomy is a highly effective and safe method of male sterilization, consistent with previous research. The overall efficacy rate of 98.7%, as demonstrated by the achievement of azoospermia or less than 100,000 non-motile sperm per milliliter in the majority of participants, aligns with the success rates reported in other studies (23-26). The low incidence of complications further supports the procedure's safety, with only a small percentage of participants experiencing minor issues such as infection, hematoma, or chronic pain, which were effectively managed through conservative treatments or minor interventions.

Comparative studies have similarly reported low complication rates and high patient satisfaction, reinforcing the reliability of vasectomy as a contraceptive method (27). The absence of major intraoperative complications in this cohort is noteworthy and highlights the proficiency of the surgical team and the efficacy of the standardized techniques employed. The preoperative counseling and detailed patient education likely contributed to the high satisfaction rates observed, as patients were well-informed about the procedure, potential risks, and the permanency of the outcome.

Despite the strengths of this study, including its prospective design, comprehensive follow-up, and adherence to established guidelines, there were some limitations. The study was conducted at a single institution, which may limit the generalizability of the findings. Additionally, the follow-up period was relatively short, and longer-term data on the durability of the vasectomy's effectiveness and the persistence of any complications were not collected. Future studies with extended follow-up periods and multi-center participation could provide more robust data on the long-term outcomes and broader applicability of the findings (28).

One of the notable strengths of this study was the use of a standardized vasectomy technique, including the removal of a minimum of 15 mm of the vas deferens and the application of thermal luminal fulguration and fascial interposition. This approach has been shown to significantly reduce the risk of recanalization and enhance the success rates of the procedure (13-15). The study also emphasized the importance of preoperative and postoperative care, including detailed patient counseling and the use of PVSA to confirm sterility, which are critical components in ensuring the procedure's success and patient satisfaction (29).

The findings suggest that while vasectomy is highly effective, efforts to improve patient compliance with PVSA are necessary. The study reported that a small percentage of participants did not achieve azoospermia within the expected timeframe, underscoring the importance of repeated semen analyses to confirm sterility. Strategies to enhance compliance, such as involving the patient's partner in counseling and providing reminders for follow-up tests, could improve outcomes (30).

Furthermore, the study highlighted the need for greater awareness and counseling about vasectomy as a viable contraceptive option among primary care physicians and gynecologists. This could address the gender disparities in contraceptive counseling and increase the utilization of vasectomy as a reliable method of family planning (20). Education and training programs for healthcare providers on the benefits and techniques of vasectomy could facilitate more informed discussions with patients.

CONCLUSION

In conclusion, this study reaffirmed the efficacy and safety of vasectomy as a male contraceptive method, with high rates of patient satisfaction and low incidence of complications. While the results are promising, addressing the limitations and enhancing patient compliance with postoperative follow-up are essential for optimizing outcomes. Future research should focus on long-term follow-up and multi-center studies to validate these findings and further explore strategies to improve patient education and compliance.

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