Postvasectomy Semen Analysis: Why Patients Don't Follow-Up

Douglas R. Smucker, M.D., Harry E. Mayhew, M.D., Daniel J. Nordlund, Ph.D., William K. Hahn, Jr., and Katherine E. Palmer

Abstract: **Semen analysis following elective vasectomy is necessary to confirm that the procedure was successful. However, many patients fail to follow postoperative instructions to obtain semen analysis. One hundred forty-one patients who had undergone vasectomy at the Family Practice Center of the Medical College of Ohio were surveyed to assess reasons for a poor rate of follow-up after vasectomy. Only 26 percent of respondents had returned two or more semen samples following surgery. Forty-five percent had not returned any samples. The inconvenience and embarrassment of having to bring semen specimens to the laboratory were identified as factors that can affect patient adherence to instructions. Respondents who had not returned any semen specimens were more likely to answer that their spouse would not be very upset if the vasectomy failed and pregnancy resulted. Our survey results identify issues for improving patient care following vasectomy. These include patient education and postoperative protocols. (J Am Board Fam Pract 1991; 4:5-9.)**

Elective vasectomy is preferred by many couples who choose a permanent method of contraception. The low risk of operative complications and high reliability make vasectomy a desirable birth control option. Late failures, measured by postvasectomy pregnancies, range from 0 percent to 0.08 percent.[1-3] Early failures, as a result of improper surgical technique, early recanalization, congenital duplication of the vas deferens, or slow clearing of sperm from the ejaculate, are more common and must be ruled out by microscopic examination of semen following vasectomy.[2] Most physicians who do vasectomies insist that two negative semen samples be submitted 4 to 12 weeks after vasectomy before the patient is assured of sterility.[2-5]

Despite the risk of early failure, many patients do not follow instructions for semen analysis following vasectomy. High rates of noncompliance with postvasectomy semen examination protocols have been reported.[6] Similar problems of follow-up were noted among patients at the Medical College of Ohio Family Practice Center. Our study was designed to determine reasons why many patients do not submit postvasectomy semen samples in order to improve patient education and follow-up rates and to simplify the postoperative protocol.

From the Department of Family Medicine, Medical College of Ohio, Toledo. Address reprint requests to Douglas R. Smucker, M.D., Department of Family Medicine, Medical College of Ohio, P.O. Box 10008, Toledo, OH 43614.

Methods

One hundred forty-one patients who had undergone vasectomy at the Family Practice Center at the Medical College of Ohio between January 1982 and December 1987 were included in the study. Of the 141 patients, 44 were from the Family Practice Center, and 97 were referred by physicians in the Toledo vicinity. Each patient had attended a preoperative appointment with a physician for counseling, physical examination, and explanation of procedures, including postoperative protocol. The patient's spouse or significant other attended the preoperative visit in most cases.

Patients were given verbal instructions about the reasons and methods for postvasectomy semen collection at the preoperative session and immediately following the procedure on the day of vasectomy. They also received a typewritten instruction sheet describing postoperative care and precautions and outlining the semen analysis protocol. These instructions were usually reinforced when patients returned for a 1-week postoperative visit.

Each patient was instructed to use one of three methods (masturbation, condom, or withdrawal) to collect postvasectomy specimens and was given

two sterile containers for semen collection. Patients were asked to collect the first specimen after at least 12 ejaculations following vasectomy and to submit a second specimen 2 or more weeks after the first. Specimens were to be taken to the Family Practice Center laboratory within 3 hours of collection. Sterility was not assured until two specimens completely free of sperm were examined. The cost of semen analysis was included in the overall charge for vasectomy.

Our sample group was sent a questionnaire about postvasectomy semen analysis in July 1988. A reminder postcard was mailed to nonrespondents 10 days later, and a second questionnaire was mailed to nonrespondents in August 1988.

The questionnaire contained items about recall of instructions on semen collection, attitudes toward vasectomy and semen collection, understanding the importance of returning a sample, complications and side effects after surgery, and whether semen samples were returned. If no semen samples had been returned, the patient was asked to provide reasons for not following instructions. Those who did return a sample were asked which method was used for sample collection.

A separate chart review was completed for each patient recording age at the time of vasectomy, number of children, complications and side effects reported to the physician, and number of semen samples returned for analysis. When a patient referred from outside the Family Practice Center did not return specimens, the referring physician's records were also reviewed to ensure that specimen analysis had not been obtained from another laboratory. Patient confidentiality was maintained at all times by use of a number coding system.

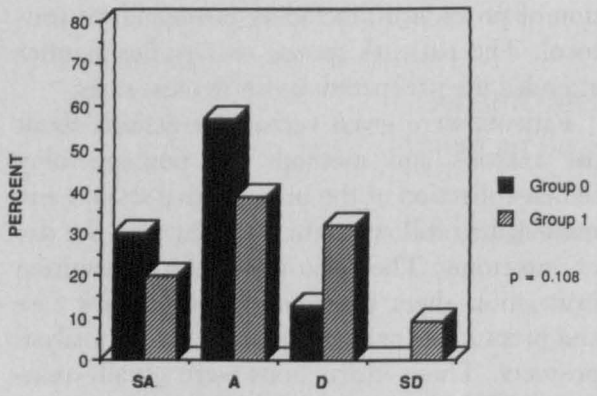

Figure 1. Responses to the statement, "It was inconvenient to collect a semen specimen in the morning or during the day, and then deliver it to the office or lab in a few hours." (SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree.)

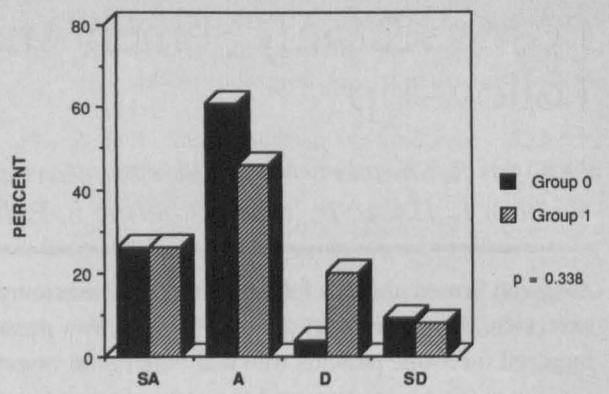

Figure 2. Responses to the statement, "It would have been more convenient to collect the semen specimen in the evening or at night, and then refrigerate it overnight for delivery to the lab anytime the next day."

The Pearson chi-square test was used to compare groups of nominal or ordinal data. Continuous variables were compared using a two-tailed *t* test.

Results

Questionnaires were mailed initially to 141 patients. Of these, 17 had moved and no forwarding addresses were available. From the remaining surveyed population (n = 124), 81 (65 percent) returned questionnaires. Four questionnaires were not included in data analysis—two were returned uncompleted and two others could not be correlated with chart review data because the attached code numbers had been removed by the respondents (n = 77).

Population

When respondents were compared with nonrespondents, there were no significant differences in the average age at the time of vasectomy, number of children, or occurrence of complications by chart review. Respondents were, however, more likely to have returned at least one semen specimen than were nonrespondents. Forty-five percent of the entire surveyed group (n = 124) did not return any semen samples, 29 percent returned one specimen, and 26 percent returned two or more.

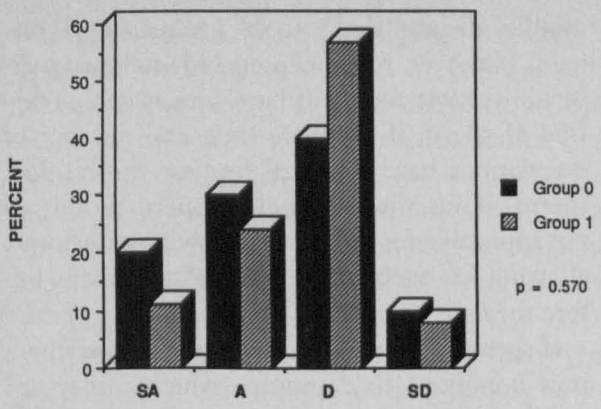

Figure 3. Responses to the statement, "Bringing in a semen specimen to the lab was embarrassing."

Patient Recall of Instructions

Although all respondents remembered being instructed about postvasectomy semen specimens, 28 percent did not remember being told of specific methods they could use to collect specimens. Thirty-three percent remembered being told only one method, 17 percent remembered two, and 20 percent remembered the physician mentioning all three methods.

When those who had not returned any specimens (Group 0) were compared with those who had returned at least one specimen (Group 1) there was no significant difference in the number of collection methods recalled. Of those who returned at least one specimen (Group 1), 70 percent used masturbation to collect a specimen, 20 percent used a condom, and 17 percent used withdrawal (4 respondents had used two different methods.) When given four possible reasons to choose from, 99 percent of all respondents chose correctly that the reason to collect postvasectomy specimens was to "make sure there are no sperm in the semen."

Convenience Factors

Most respondents (68 percent) agreed that it was inconvenient to collect a specimen during the day so it could be delivered to the laboratory within 3 hours of collection (Figure 1). Even more respondents (77 percent) agreed that it would have been more convenient to collect a specimen at night, refrigerate it in a closed container, and deliver it to the laboratory the next day (Figure 2). Fifty percent agreed or strongly agreed that it was embarrassing to bring a semen specimen to the laboratory (Figure 3). For these three questions, there were no significant differences in responses between Group 0 and Group 1.

Attitudes about Vasectomy

When asked how they would feel if their vasectomy failed and a pregnancy resulted, 14 percent answered they would be happy, 27 percent would be slightly upset, and 59 percent would be very upset. Answers from Group 0 and Group 1 were not significantly different on this question (Figure 4).

Respondents who had not returned a specimen, however, were much less likely than those who had returned one to answer that their wives or significant others would be very upset if their vasectomy failed (Figure 5). All of the respondents in Group 0 thought that their wives or significant others were aware that they had not returned a semen specimen for analysis. A majority of both groups (69 percent) stated that the decision to have a vasectomy was a mutual one between themselves and their wives or significant others.

Seventy-seven percent of all respondents were glad they had had their vasectomy, 19 percent had some regret, and 4 percent had considerable regret. There was no difference between Group 0 and Group 1. Also, there were no differences in the number or severity of complications reported between Group 0 and Group 1.

Other Factors

The most frequently chosen reasons why those in Group 0 did not return a specimen were inconvenience, embarrassment, forgetfulness, or they felt certain of sterility. Only one respondent was

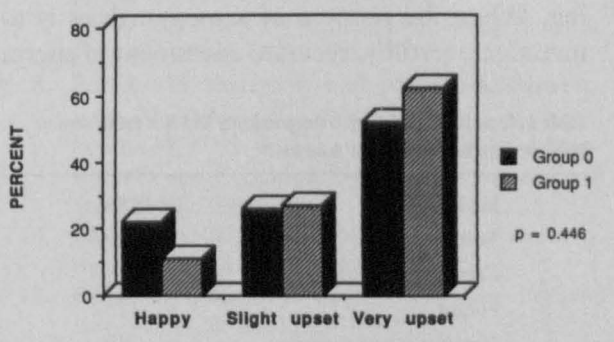

Figure 4. "If your vasectomy failed and your wife became pregnant, how would *you* feel?"

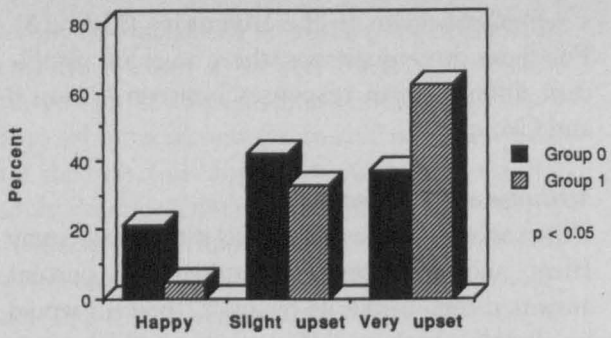

Figure 5. "How do you think your wife would feel if your vasectomy failed and she became pregnant?"

afraid that surgery would have to be repeated if semen analysis was positive for sperm (Table 1).

Discussion

Ideally, for statistical purposes, the response rate in survey research should surpass 70 percent.[4] Considering the potentially embarrassing nature of the subject, our response rate of 65 percent was higher than anticipated. It was not surprising that patients who had failed to return any specimens were also less likely to return a completed questionnaire.

The results of our survey identify factors that influence a patient's decision whether to follow postoperative instructions for semen analysis. With these results in mind, methods of patient education and the logistics of the postoperative protocol can be modified to help improve the rate of follow-up.

Convenience factors were of prime concern to all respondents, including those who had followed postoperative instructions. Convenience for the patient could be greatly improved by allowing him to collect the specimen during the evening or night, keep it in a closed container overnight, and take it to the laboratory any time the next morning. When the purpose of semen analysis is to investigate fertility, accurate assessment of sperm motility dictates that a fresh specimen be examined. However, for semen analysis following vasectomy, most men will have semen completely free of sperm if adequate time and number of ejaculations have occurred to clear the residual sperm.[9] Thus, the assessment of sperm motility is not applicable for most men following vasectomy, allowing for overnight storage of specimens before they are examined.

Table 1. Reasons Why Group 0 Respondents Did Not Bring Semen Specimens to Laboratory for Analysis.*

Inconvenient	58%
Embarrassment	38%
Certain of sterility	29%
Forgot	17%
Afraid to repeat surgery	4%
Not instructed to do so	0%

*More than one factor could be chosen.

If sperm are seen on a postoperative specimen, it is important to determine whether they are motile. Motile sperm may be indicative of an early recanalization, congenital duplication of the vas deferens, or the possibility that one of the vas deferens was not surgically interrupted.[10] The significance of a few nonmotile sperm in a fresh semen specimen is somewhat controversial. Some have suggested that patients can be reasonably assured of sterility if only nonmotile sperm are seen on a fresh specimen.[10,11] One study followed 59 patients who had persistence of nonmotile sperm following vasectomy. With an average of 14.5 years of follow-up, no pregnancies had occurred in this group.[2] Despite this and other reports of the insignificance of nonmotile sperm in postvasectomy semen,[10,11] many physicians continue to insist on two completely aspermic specimens following vasectomy before sterility is assured.

A change in protocol to require only one aspermic sample or a fresh specimen that showed only few, nonmotile sperm would increase convenience for patients (Figure 4). Most (88 percent) of our patients have shown completely aspermic semen specimens on the first sample brought to the laboratory following vasectomy. In the new, simplified protocol, these men would then be given reasonable assurance of sterility. If any sperm were seen, the patient would be asked to bring a second specimen 1 month later, preferably a fresh specimen. If sperm persisted, the fresh specimen would allow examination for sperm motility. The patients would be asked to bring a specimen each month until either one aspermic sample was obtained or samples showed only a few nonmotile sperm.

To help decrease embarrassment in delivering a sample to the Family Practice Center, a change in protocol has been made so that patients receive a container labeled with their name, date of vasectomy, telephone number, and type of specimen.

The patient is also given a small paper bag so that once the specimen is collected, it can be sealed, placed in the paper bag, and delivered to the reception desk at the Family Practice Center. Because the container is labeled, whoever brings it needs simply to tell the receptionist that it is a specimen for the laboratory and does not have to identify it as a semen specimen or give the name of the patient.

Approximately one-third of patients surveyed stated they would be happy or only slightly upset if the vasectomy failed and pregnancy resulted. Although a difference between Group 0 and Group 1 was expected on this attitude toward vasectomy, no difference was found. However, the perception of the spouses' attitudes toward a possible vasectomy failure did show a significant difference between the two groups. Attitudes regarding therapeutic abortion for termination of an unwanted pregnancy were not addressed in our survey and could further influence couples' feelings about the possibility of vasectomy failure.

The patient's spouse often plays an important role in insuring proper follow-up after vasectomy. In the counseling session attended by both patient and spouse, the physician should explain the risks of vasectomy failure and determine how each partner would feel if pregnancy resulted. When there is any ambivalence about avoiding future pregnancy, the couple's desire for vasectomy should be reevaluated.

Although all respondents remembered being instructed about postvasectomy semen specimens, a significant number did not remember being told specific methods they could use to collect specimens. More attention to explaining specimen collection during the preoperative counseling visit when the spouse is present could be helpful. Instead of including instructions for semen collection as a paragraph at the end of a single sheet of postoperative instructions, a new patient handout on a separate sheet describing only the postoperative protocol has been developed. A new preoperative consent form adapted from Greenberg's suggestions includes a statement about the importance of postvasectomy semen analysis and is signed by both the patient and his spouse.[12] These efforts hopefully will decrease embarrassment for the patient and help make the spouse aware of the importance of postoperative follow up.

At the 1-week postoperative follow-up visit, the postoperative protocol is reviewed, and some physicians supply the patient with a plain latex condom that can be used for semen sample collection. Because patients are too embarrassed to ask how to collect a specimen correctly, an open discussion with the patient and his spouse can help to ease embarrassment and increase the likelihood of bringing the specimen to the laboratory.

The results of this study suggest aspects of postvasectomy protocols to improve follow-up rates. Attention to increasing convenience and decreasing embarrassment are particularly important. Physicians should be aware of couples' attitudes toward possible vasectomy failure and the importance of the spouse in ensuring proper postoperative follow up. These issues help focus efforts to improve patient care following vasectomy.

Changes in our routine patient instruction and postoperative protocol have been instituted. Further study, including a repeat audit of records and survey of patient attitudes, is planned to assess the effects of these changes on follow-up rates.

References

1. Schmidt SS. Vasectomy. JAMA 1988; 259:3176.
2. Alderman PM. The lurking sperm. A review of failures in 8879 vasectomies performed by one physician. JAMA 1988; 259:3142-4.
3. Philp T, Guillebaud J, Budd D. Late failure of vasectomy with two documented analyses showing azoospermic semen. Br Med J 1984; 289:77-9.
4. Blandy JP. Vasectomy. Br J Hosp Med 1979; 21:520-7.
5. Mayhew HE. Vasectomy. Semin Fam Med 1981; 2:94-100.
6. Dervin JV, Barnett RC, Stone DL. Patient noncompliance with postvasectomy semen examination protocol. J Fam Pract 1982; 14:487-90.
7. Henry RC, Zivick JD. Principles of survey research. Fam Pract Res J 1986; 5:145-57.
8. Edwards IS. Vasectomy: a simple postoperative regimen. Med J Aust 1977; 1:814-7.
9. Freund M, Davis JE. Disappearance rate of spermatozoa from the ejaculate following vasectomy. Fertil Steril 1969; 20:163-70.
10. Edwards IS. Vasectomy: a simple postoperative regimen. Med J Aust 1977; 1:814-7.
11. Barnes MN, Blandy JP, England HR. One thousand vasectomies. Br Med J 1973; 4:216-21.
12. Greenberg MJ. Vasectomy technique. Am Fam Physician 1989; 39:131-8.