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Criteria for Determining That a Vasectomy Has Succeeded

Androlog Summary

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Note: Postings to *Androlog* have been lightly edited before publication.

When counseling a patient regarding the potential risks and benefits of vasectomy, it is critical to point out that the procedure may fail to produce azoospermia. Even in those cases where azoospermia is ultimately achieved, it may take a period of several months before sperm are cleared from the semen. In this *Androlog* exchange, Dr Jon Pryor asks what criteria the members use to identify a ''successful vasectomy'' and what literature they can site to support those criteria.

> What are considered acceptable criteria for a successful vasectomy in the United States? I tell my patients that a vasectomy is not perfect; even with azoospermia, I quote a 1 in 3000 chance of a possible future pregnancy. Certainly if there are any moving sperm after 6 months, I deem it a failure. There is European literature to suggest that 10 000 total nonmotile sperm is satisfactory, as long as you warn the couple there is always a chance of pregnancy (again, even if there is azoospermia this is the case). Is there any literature to support this 10 000 number? Or is there literature someone knows about to support a higher or lower number other than zero?

Dr Arnold Belker replies to Dr Pryor's inquiry and provides further detail regarding ''special clearance'' criteria that may be considered when small numbers of residual nonmotile sperm remain in the semen.

> Dr Pryor states in his inquiry that European literature indicates that ''10 000 nonmotile sperm is satisfactory'' to inform a man that he is sterile after vasectomy. There actually are 3 criteria that were used by Philp et al (*Brit J Urol.* 1984;56:745–748) to give men with sperm persistence ''special clearance'' for unprotected intercourse after vasectomy. Those criteria were: 1) 2 consecutive sperm counts of less than 10 000/mL; 2) no motile sperm; 3) a minimum of 7 months elapsed time since vasectomy. Regarding item 2), or ''no motile sperm,'' it is important for the specimen to be examined preferably within an hour after ejaculation, but certainly no longer than a few hours afterwards. Just as we give patients explicit instructions for semen collection when evaluating their fertility status, we should inform patients to deliver the specimen to the laboratory within an hour of collection when the purpose is to evaluate the postvasectomy outcome to ascertain the true absence of sperm motility if sperm still are present.
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> Dr Pryor also inquired if there is any evidence to support this 10 000/mL number. Davies et al (*Brit J Urol.* 1990;66: 211–212) used the 3 criteria of Philp et al to give ''special clearance'' to 151 men. All but 1 of 50 patients whose semen was examined a minimum of 3 years later had become azoospermic; the patient with sperm still present at 3+ years after vasectomy had a concentration of 5000/mL; no pregnancies were reported in the series.
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> Edwards (*Fertil Steril.* 1993;59:431–436) recommended ''Earlier testing after vasectomy, based on the absence of motile sperm.'' He felt that the absence of motile sperm (''provided the specimen was examined within 12 hours'') was sufficient evidence of postvasectomy sterility. However, the follow-up of his patients appeared less stringent than the follow-up of either Philp et al or Davies et al.
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> Hope this helps.

Drs Lars Bjorndahl and Ulrik Kvist respond, making the important point that it is important to centrifuge the specimen when evaluating a postvasectomy semen sample for azoospermia. They go on to provide data regarding the poor reliability of nonspun specimens in this context.

> Regarding acceptable criteria for successful vasectomy: As a comment to the recent discussion on criteria for successful vasectomy, we would like to draw attention to an important laboratory aspect:
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> How much can you trust a sperm count result of 0/mL in your lab report?
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> To distinguish low sperm concentrations from complete azoospermia, the techniques for routine determination of sperm concentration in ordinary semen samples in the andrology laboratory are not sensitive enough. If the routine technique gives the answer 0 spermatozoa per milliliter, there can still be significant numbers of spermatozoa in the sample.
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> Thus, with the report ''a single previous specimen that was azoospermic'' the specimen may have been oligozoospermic rather than azoospermic, but the technique failed to detect sperm presence.
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> In short: to distinguish between very few and no spermatozoa, a much larger proportion of the ejaculate must be examined. If a sample does contain 10 000 spermatozoa per milliliter, the risk that the lab answer 0 spermatozoa is 90% for a 10 nL chamber (Makler), some 67% for a wet drop preparation, and 37% for assessment in 2 Neubauer chambers (100 nL of semen). It is therefore evident that we need to study a larger proportion of the semen sample. This should be done by concentrating the sample.
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> It is thus evident that various published frequencies of azoospermia and oligozoospermia after vasectomy are strongly influenced by the technique used by the laboratory.

For details, see Manual on Basic Semen Analysis (ESHRE Monograph, 2002) or manual available at the NAFA web site http://www.ki.se/org/nafa/manual/manual.html.

Dr Kimball Pomeroy then provides some helpful citations regarding this issue.

1) Kim and Lipshultz. Standards of care for vasectomy. *Contemp Urol*. Nov. 1996:41–55; 2) Knijff et al. Persistence or reappearance of nonmotile sperm after vasectomy: does it have clinical consequences? *Fertil Steril*. 1997;67: 332–335; 3) Alderman. General and anomalous sperm disappearance characteristics found in a large vasectomy series. *Fertil Steril.* 1989;51:859–862. 4) Alderman. The lurking sperm. *JAMA.* 1988;259:3142–3144; 5) Davies et al. The long-term outcome following ''special clearance'' after vasectomy. *Brit J Urol.* 1990. 66:211–212.

I hope this helps.