



American
Urological
Association, Inc.®



A BASIC GUIDE TO MALE

INFERTILITY



Getting Help for Obstructive Azoospermia

A doctor's guide for patients developed by
the American Urological Association, Inc.®

Based on the AUA Best Practice Policy and
ASRM Practice Committee Report

Glossary

Aspermia: the complete absence of semen.

Azoospermia: the complete absence of sperm from the semen.

Ejaculatory duct: paired ducts in males that are located behind the bladder and within the prostate. The end of the vas deferens continues into the ejaculatory duct which transports sperm into the urethra.

Epididymis: a tightly coiled tubule located behind the testes. Sperm mature as they travel through the epididymis.

Non-obstructive azoospermia: azoospermia that is due to absence or marked reduction of sperm production by the testes.

Obstructive azoospermia: azoospermia that is due to a blockage in the sperm duct system.

Prostate: a small gland about the size of a walnut, located below the bladder. It produces some of the sperm-carrying fluid for the semen.

Scrotum: the pouch of skin that hangs from the lower abdominal region below the penis.

Semen: fluid that comes out during ejaculation and orgasm. It contains sperm and secretions from glands of the male reproductive tract.

Seminiferous tubules: specialized microscopic ducts located within the testes. Immature sperm begin to mature in these tubules.

Testes (testicles): the organs that produce sperm. They are paired oval-shaped glands located in the scrotum.

Urethra: the tube that carries the urine from the bladder and the semen from the prostate and ejaculatory ducts out through the tip of the penis. It is the final passageway for both urine and sperm to leave the body.

Urologist: a doctor who specializes in diseases of the urinary tract and male reproductive system.

Vas deferens (also called the vas): a muscular tube through which the sperm flow. It begins at the epididymis and ends behind the bladder.

What Is Azoospermia and How Common Is It?

Definition: *The term azoospermia refers to the complete absence of sperm from the semen. About 10-15% of cases of male infertility are due to azoospermia.*



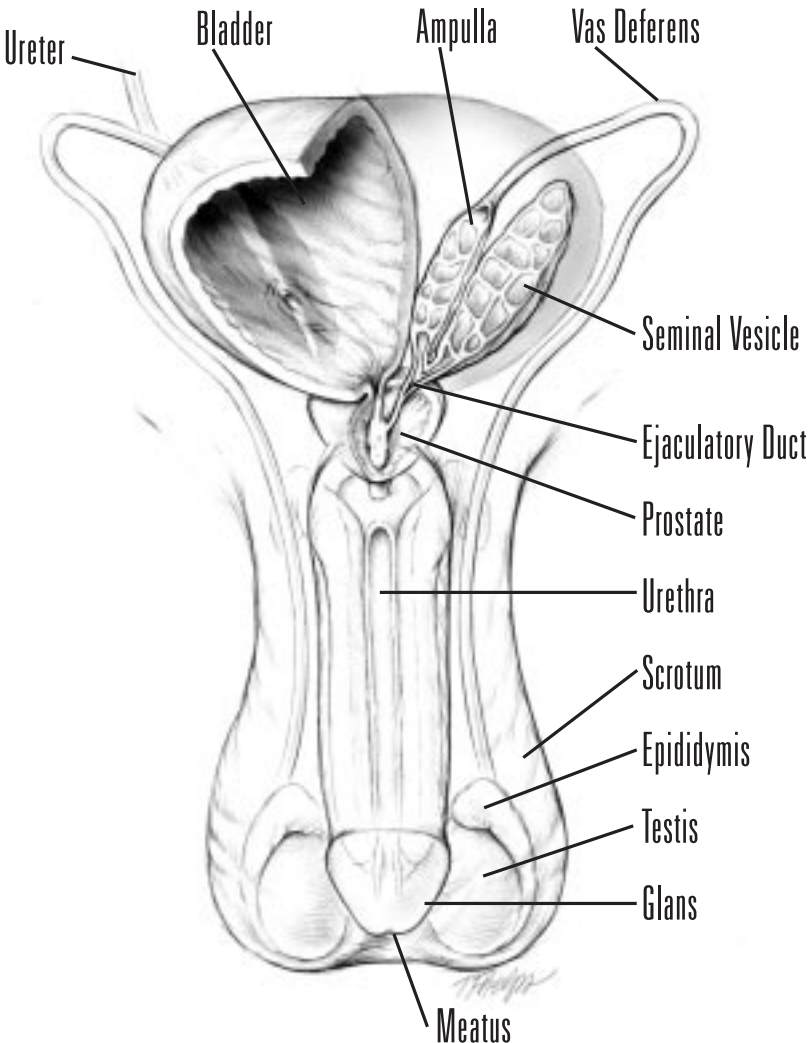
Azoospermia, or the complete absence of sperm from the semen (also called the seminal fluid or the ejaculate), is different from the complete absence of semen, which is called aspermia. Azoospermia is more common than aspermia. Azoospermia has many causes. Some of the causes are called “obstructive,” meaning that there is a blockage in the sperm delivery system. Other causes of azoospermia are “non-obstructive,” meaning that there is absence or very marked reduction of sperm production in the testicles. This booklet is only about the obstructive causes of azoospermia.

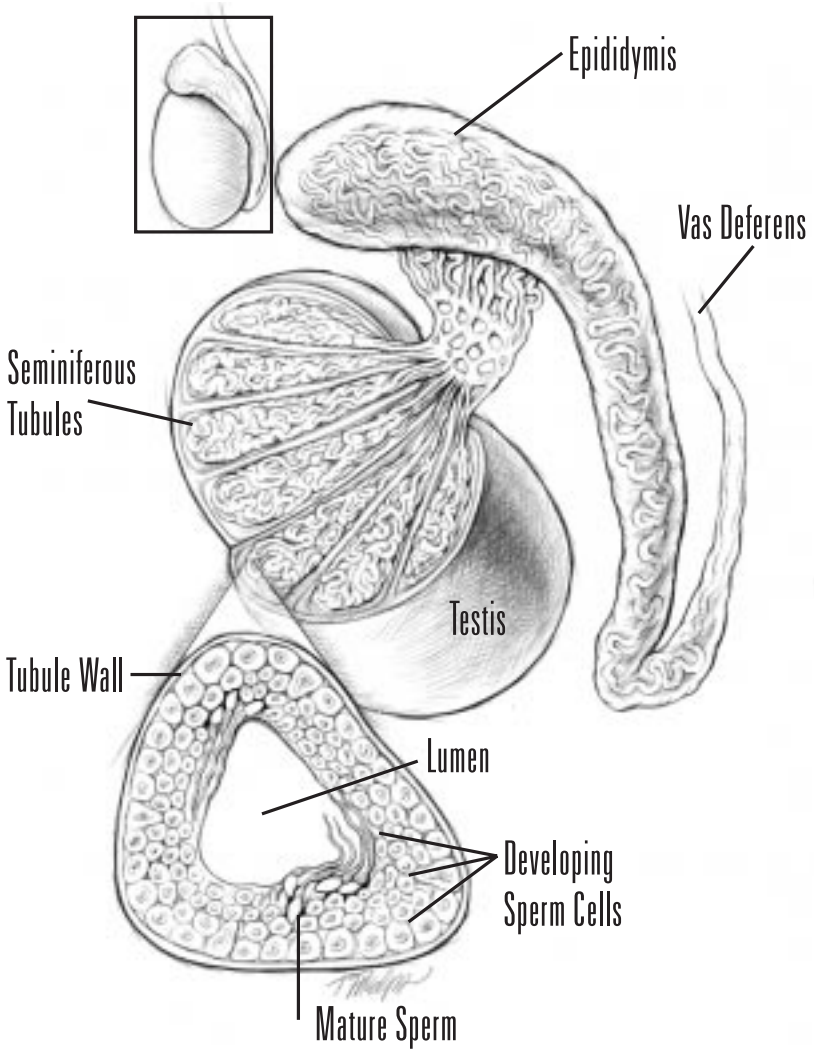
Even if your doctor has already told you that you have obstructive azoospermia, it is important to remember that the inability to conceive a child often results from problems contributed by both partners. Doctors now know that a male factor for infertility may be involved in as many as half of all infertile couples. Successful outcomes very often depend on both partners being treated.

Because this is a time when key decisions must be made, couples should seek help together. They should try to avoid placing blame on one another. This booklet is designed to provide answers to your questions on obstructive azoospermia so that you and your partner, together with your physicians, can choose the best treatment options for you.

Overview of the Male Reproductive System: How Are Sperm Produced?

The functions of the male reproductive system are to produce sperm and store sperm. The system also transports the sperm to the outside of the body. These 3 steps occur throughout the reproductive life of a male. This process is regulated by a number of hormones. The following diagrams will help you to understand how the male reproductive system works.





The organs that produce sperm are called the testes. There are 2 testes. They are located in the scrotum, the pouch of skin that hangs from the lower abdomen below the penis. In addition to producing sperm, the testes produce the male hormone testosterone.

Sperm production begins with immature sperm cells that grow and develop within the seminiferous tubules. These are very tiny tubules located within the testes. In the seminiferous tubules, the sperm in the testes are not yet fully mature. As a result, they are unable to move on their own.

With the help of other accessory organs the sperm mature and become functional. The main organ in this process is called the epididymis. The epididymis is a coiled tubule located behind the testis. Sperm mature as they travel through the epididymis. During the climax (orgasm), the semen, the fluid that contains the sperm, is ejaculated. Semen is composed of fluid from the epididymis, vas deferens, seminal vesicles, and prostate. The sperm must travel through a series of ducts, including the epididymis, vas deferens, ampulla of the vas and ejaculatory ducts. Once the semen is ejaculated, the sperm live about 2 days in the female reproductive tract.

The development and transportation of mature, functional sperm depend on a specific sequence of events. As described next, obstructions to the movement of sperm through the male reproductive tract can occur in a number of places along the pathway. Such obstructions prevent sperm from getting to their destination.

What Are the Causes of Obstructive Azoospermia?



Obstructive azoospermia accounts for about 40% of azoospermia cases. Obstructions may result from defects in any of the “ducts” (passageways) involved in the sperm delivery system. As seen in the diagrams, the main ducts through which sperm must pass are called the 1) epididymis, 2) vas deferens, 3) ampulla of the vas and 4) ejaculatory duct.

Ductal obstruction may be either “congenital” (you were born with it) or “acquired” (you were not born with it). Vasectomy is a common form of male contraception. In it, the vas deferens is cut and sealed on each side, forming an acquired obstruction. It is the most common cause of obstruction in the vas. Another common cause is infection. Infection can make a scar form in the epididymis. Congenital obstruction can be due to either a malformation or the absence of a ductal structure.

What Is the Purpose of an Evaluation for Obstructive Azoospermia?

Obstruction of the male reproductive tract can often be corrected by an operation. But in some men, surgical correction is not possible. In this situation it may still be possible for the man to father children by removing a few sperm from his reproductive system and using the sperm for in vitro fertilization (IVF) with intracytoplasmic sperm injection (ICSI). Some of the more common treatment options will be discussed further.

Finding the cause of your obstructive azoospermia is helpful for several reasons. First, it allows your physician to decide whether you are a candidate for surgical treatment. Second, if your obstruction is not surgically treatable, your doctor might be able to suggest other treatment options for you and your partner. Third, if there is a major medical or genetic disorder underlying the azoospermia, it may be important to identify these disorders. It is also important to know whether the genetic problem might be passed on to your children.

What Is the Best Treatment Option for Me? How to Decide.

The options available to couples in whom the male partner has obstructive azoospermia are:

- surgical correction of the obstruction
- removal (retrieval) of sperm from the male reproductive system combined with IVF/ICSI
- artificial insemination with sperm from a donor
- adoption
- deciding not to have children



The best treatment option for you depends on the cause of the obstruction as well as a number of personal factors. The reproductive health status of your partner, social, marital, religious, cultural and financial

factors, and genetic factors are other important considerations. Before you choose the best treatment for you, an evaluation of both you and your partner is recommended. This evaluation will determine whether your obstruction is surgically correctable, and what are the approximate chances for having a baby with each option. It will also tell you what the costs are for each option, and whether there are any genetic abnormalities that might be passed on to your children.

The genetic abnormality that may be associated with obstructive azoospermia occurs in some men who are born without the vas deferens. This condition is called congenital bilateral absence of the vasa deferentia (CBAVD). About two-thirds of men who have CBAVD have a genetic mutation that can cause cystic fibrosis if they initiate a pregnancy with a woman who has the same genetic mutation. Fortunately, there is only a 4% chance that a woman will have the cystic fibrosis gene abnormality. Therefore, if you have CBAVD, genetic testing and counseling should be sought to help you and your partner understand the risks of passing this defect to your children. If there is a significant risk of having children with cystic fibrosis, you may want to consider alternatives such as donor insemination or adoption.

Am I a Good Candidate for Surgical Treatment?

Microsurgical Reconstruction



Reconstruction of the reproductive tract is often a successful treatment for obstructive azoospermia. It can be used, for example, to reverse a vasectomy. The doctor's skill at microsurgery can affect the results of the procedure. If you are thinking about this type of treatment, it is important to keep in mind that best results are obtained by sur-

geons with specialized training and experience in reproductive microsurgery. After vasectomy reversal, sperm return to the semen in about 70-95% of men. Pregnancy without assisted reproductive technology occurs in 30-75% of couples. The chance for pregnancy depends on many factors, most importantly, the age and fertility status of the female partner and the number of years between the vasectomy and its reversal. The longer you wait to reverse a vasectomy, the less the chances are

for a successful reversal. Still, there is no magic number of years beyond which a reversal is certain to fail. Contrary to what is commonly believed, the chance for success with a vasectomy reversal does not suddenly decline after 10 years or after any other specific number of years.

Microsurgical reconstruction is a 2-4 hour operation but it is often performed as an outpatient procedure. It is usually done under general anesthesia although it can be done with local anesthesia and intravenous sedation. This surgery causes only mild postoperative pain. Patients should expect to be out of work for 4-7 days.

Transurethral Resection of the Ejaculatory Duct (TURED)

This procedure can be used to treat ejaculatory duct obstruction. It involves passing a scope into the urethra and cutting into the ejaculatory ducts. Transurethral resection of the ejaculatory duct results in the appearance of sperm in the ejaculate in about 50-75% of men. Pregnancy rates following this surgery are about 25%.

Transurethral resection of the ejaculatory duct requires general or spinal anesthesia. It can be done as an outpatient procedure or with just one night in the hospital. Postoperative pain is minimal. Some surgeons place a urinary catheter (drainage tube) in the bladder for a short time after this surgery. Patients should expect to be out of work for 1-3 days.



Should I Consider Sperm Retrieval With In Vitro Fertilization Rather Than Surgical Reconstruction?

Intracytoplasmic sperm injection:



Intracytoplasmic sperm injection (ICSI) is the injection of a single sperm into a mature oocyte (egg). It is the form of in vitro fertilization (IVF) that must be used in almost all cases of obstructive azoospermia when sperm are removed from the testicle or epididymis. This is because the number of motile (active) sperm that can be obtained is small and only enough to do the ICSI technique rather than standard IVF. Using the ICSI technique, it is reasonable to expect that the chance to have a baby will be about 30% for each menstrual cycle in which ICSI is attempted. Sperm retrieval followed by ICSI is preferable to surgical treatment when:

- advanced female age is present
- female factors requiring IVF are present
- sperm retrieval/ICSI is the financially preferable option

Sperm Retrieval:

There are several methods of sperm retrieval. The choice of method depends mainly on the urologist who will perform the procedure and the laboratory performing the ICSI. Sperm retrieval may be performed prior to or simultaneously with the female partner's egg retrieval. Many reproductive centers prefer to use "fresh" sperm obtained on the same day as the egg retrieval, but others prefer to use sperm that have been previously harvested and frozen. Your doctor should explain the different techniques to you before you start.

For those whose azoospermia is due to obstruction, sperm retrieval can be accomplished by either a needle aspiration or microsurgical technique. Details of each procedure should be discussed with your physician.

Are There Any Risks Associated With IVF/ICSI?

There are some risks associated with this type of treatment for infertility. These risks include:

- **Ovarian hyperstimulation.** This is a risk to the female partner of the couple. It is due to the hormone stimulation in the IVF/ICSI process. In some women, the ovaries become over-stimulated by the hormones, causing high blood pressure, fluid accumulation (edema), malaise, weakness, and other symptoms. Mild ovarian hyperstimulation, which is easily tolerated, can occur in up to 20% of patients. Moderate ovarian hyperstimulation occurs in up to 5% of women undergoing IVF. Severe ovarian hyperstimulation, which can cause severe medical problems in addition to the failure of the ICSI, occurs in 1% of women undergoing IVF.
- **Multiple gestations (births).** In the U.S., there is a 30-35% risk for twin gestations and 5-10% for triplets (or higher) gestations. Multiple gestation births are associated with increased infant morbidity and mortality rates due primarily to prematurity.

You and your partner may want to discuss the advantages and disadvantages of IVF/ICSI with your physician. Knowing as much as you can about these procedures can help you make the right choice.

Some Final Considerations . . .

Identifying and treating reversible conditions may improve the male partner's fertility and allow for conception through intercourse.

Detection of conditions for which there is no cure will spare couples the distress of attempting ineffective therapies. Finding genetic causes of male infertility allows couples to be informed about the potential to transmit genetic problems to their offspring.

Many complex factors go into the decision to use microsurgical reconstruction of the male reproductive system versus sperm retrieval with ICSI. Microsurgical reconstruction of the male reproductive system often is more cost-effective than sperm retrieval with IVF/ICSI. IVF/ICSI requires intervention in both male and female partners and is more expensive than microsurgical reconstruction in most centers. Microsurgical reconstruction allows couples to have subsequent children without additional medical treatment. On the other hand, there are situations in which sperm retrieval with IVF/ICSI is a better choice for you. For example, couples in whom there is both male and female factor infertility are usually better treated by sperm retrieval and ICSI.

The fertility status of the female partner is another important consideration. For example, the woman's age is important. Although individuals vary greatly, a woman's fertility begins to decline after the age of about 35. This means that the chance for success with both microsurgical reconstruction and sperm retrieval with ICSI decreases with increasing female partner age, especially beyond age 37. It is important to understand that after a successful microsurgical vasectomy reversal, the average interval until pregnancy is about one year, while a successful ICSI cycle pregnancy occurs within 1-2 months of starting hormonal therapy.

The choice of either sperm retrieval with IVF/ICSI or microsurgical reconstruction should also be influenced by the pregnancy rates achieved with ICSI by the IVF team with which you are working. The pregnancy rates of the surgeon who would perform reconstructive microsurgery should also influence your choice. In addition, the choice of treatment for obstructive azoospermia is impacted by the preferences of the couple, cost considerations, and the availability of specific medical expertise in the local community.

For More Information . . .

The following list of organizations is intended as a resource for couples who would like more information. If you still have unanswered questions, need help finding a specialist, or need some emotional support, there are groups you can contact. Remember, there are many couples experiencing similar difficulties. Getting the support and education you need can save you both time and frustration. The more you know, the better decision you can make.

American Society for Reproductive Medicine

1209 Montgomery Highway
Birmingham, Alabama 35216-2809
Phone: (205) 978-5000
Web: <http://www.asrm.org>

Reproductive Health Council

c/o American Foundation for Urologic Disease
1128 North Charles Street
Baltimore, MD 21201
Phone: (410) 468-1800
Fax: (410) 468-1808
Web: www.afud.org

RESOLVE

1310 Broadway
Somerville, MA 02144-1779
National HelpLine: (617) 623-0744
Business Office: (617) 623-1156
Web: www.resolve.org

Society for the Study of Male Reproduction

Executive Director: Wendy J. Weiser
1111 N. Plaza Dr. Suite 550
Schaumburg, IL 60173
Phone: (847) 517-7225
Fax: (847) 517-7229
Web: <http://www.ssmr.org/>

This doctor's guide for patients is intended to stimulate and facilitate discussion between the patient and doctor regarding the types of evaluation and treatment described in summary fashion in this brochure. The brochure was developed by the Male Infertility Best Practice Policy Committee of the American Urological Association. It is based on the *Report on Management of Obstructive Azoospermia*, a document jointly developed by the American Urological Association and the American Society for Reproductive Medicine.

Other Doctor Guides for Patients in this series include: *A Basic Guide to Male Infertility: How to Find Out What's Wrong* and *A Basic Guide to Male Infertility: Answers to Your Questions About Varicoceles*.

This material may not be reproduced in electronic or other format without written permission of the AUA.

For additional copies of this brochure physicians may contact:

American Urological Association, Inc.®

1120 North Charles Street

Baltimore, MD 21201

Phone: (410) 223-4367

www.auanet.org