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## SPERM EXTRACTION AND ASPIRATION

Advances in Assisted Reproductive Technique, namely IVF with sperm injection (IVF/ICSI), now allows pregnancy to occur with very few sperm.

Several groups of men may require IVF/ICSI to father children and the two most frequent groups are:

1. Men with severely reduced sperm production with extremely low (severe oligospermia) or no sperm in the semen (non-obstructive azoospermia, NOA).
2. Men with normal sperm production but obstruction or absence of the genital ducts (obstructive azoospermia, OA) prevent sperm from reaching the ejaculate, this group includes men who had vasectomy or had failed vasectomy reversal.

In men with severely reduced sperm count, the sperm obtained from the ejaculate may not be suitable for IUI since they tend to be low in number and motility. These sperm, on the other hand, do quite well with IVF/ICSI with comparable pregnancy outcome (30 to 40%) with IVF performed for other reasons.

### **For non-obstructive azoospermia: Testicular sperm extraction, TESE, non-microscopic**

In the NOA group, patchy area of sperm production may be present but the sperm produced are so few that none survives the transit to the outside. Testicular tissue may be obtained directly from the testis and sperm, if present, can then be extracted in the laboratory for IVF/ICSI. The TESE procedure is identical to that of testis biopsy; a small incision is made on the scrotum and one to several small testis tissue samples are submitted to the lab for extraction. We no longer perform routine TESE in NOA men since the introduction of micro-TESE.

### **Micro-TESE**

In a more refined approach, an operating microscope is used to magnify the testicular tissue prior to tubule removal. Sperm containing tubules have a different appearance when examined under high magnification; this difference allows for selective removal of only sperm-containing tubules and avoids unnecessary removal of tissue devoid of sperm. Micro-TESE has a significantly **higher success** rate than and has replaced routine TESE in men with NOA.

Please note that micro-TESE is not a testis biopsy and no CPT code currently exists. It is labor intensive and expensive. Operative time varies but typically it is at least 1 to 2 hours, as one must painstakingly examine the testicular content prior to tubule excision. Inability to retrieve sperm with micro-TESE is the effective end to our effort in helping these men achieving biological parenthood; as such, no effort is spared to reach a definitive conclusion. Both testes are explored if necessary.

Fee schedule is based on the operative time; we routinely reserve the operation room for 2 hours.

**In men with obstructive azoospermia**, more options are possible:

1. Percutaneous Epididymal Sperm Aspiration and PESA
2. Testicular Sperm Aspiration or TESA
3. Testicular Sperm Extraction or TESE
4. Microscopic Epididymal Sperm Aspiration or MESA



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**PESA and TESA** are similar procedures. A small needle is placed in the epididymis or testis, suction is applied and a small number of sperm are obtained. Both are easily performed in the office under local anesthesia and are inexpensive. Given the collection method is via needle, only a small number of sperm are obtained, enough to be immediately used with IVF but not enough for cryopreservation to prevent the future need for repeat aspiration.

**TESE** is identical to the procedure outlined for men with NOA except that large number of sperm is easily obtained for either immediate use or cryopreservation.

**MESA** is similar to micro-TESE in that it is an operating room procedure. The engorged epididymis is examined under an operating microscope and the epididymal fluid laden with sperm is then collected for either immediate use or cryopreservation. MESA is expensive and given the ease of performing aspiration in men with OA and the comparable pregnancy rate, it is rarely used in my practice.

The advantages of **PESA** and **TESA** are their ease to perform and the lower cost; the disadvantages are the small number of sperm obtained and the performance of the procedures concurrent with the wife's egg retrieval. In most cases, I am readily available but despite our best effort to predict the timing of IVF, the need to retrieve sperm on a short notice can present a challenge to our schedule.

On the other hand, the advantages of **TESE** and **MESA** are the elective nature of these procedures and the large number of sperm retrieved for cryopreservation, which obviates the need for future retrieval procedure. The disadvantages are that these procedures are more involved and their higher cost.

The common denominator of all the procedures is that the sperm retrieved are functionally immature and small in quantity when compared to a normal ejaculate. Although these sperm are quite capable of fertilization and achieving normal pregnancy, they do not have the ability to penetrate eggs on their own and thus IVF/ICSI is necessary to initiate fertilization.

Please feel free to contact us if you have any questions regarding these procedures.