Surgical Sperm Retrieval for Assisted Reproduction: Tricks of the Trade

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Where Should Sperm be Taken From?

- Ejaculate: Penile vibratory stimulation (PVS),
  electro-ejaculation (EEJ)

- Excurrent ductal system: Epididymis, vasa, seminal vesicles

- Testes and epididymides
Where Should Sperm be Taken From?

- **Epididymis**
  - Motile sperm
  - More mature sperm

- **Testis**
  - Mostly immotile sperm

Sperm Retrieval Techniques

**Obstructive azoospermia**
- PESA: Percutaneous Epididymal Sperm Aspiration
- MESA: Microsurgical Epididymal Sperm Aspiration

**Nonobstructive azoospermia**
- TESA: TE(ster)iculal Sperm Aspiration
- TESE: TE(ster)iculal Sperm Extraction
Percutaneous Epididymal Sperm Extraction (PESA)

**Advantages**
- No microsurgery
- Local anesthesia

**Disadvantages**
- Variable yield
- High complication rates

Microsurgical Epididymal Sperm Extraction (MESA)

**Advantages**
- Low complication rates
- High yield

**Disadvantages**
- Microsurgical skill
- Anesthesia required
- Scrotal incision
MESA – without any fancy tools!

MESA
TECHNIQUES FOR FINDING SPERM FROM TESTES

TESE

TESA

FNA mapping

Microdissection

Testicular Sperm Aspiration (TESA)

Advantages
No microsurgery
Local anesthesia

Disadvantages
Variable yield
High complication rates
Testicular Core Biopsy

**Advantages**
Core tissue for cellular architecture

**Disadvantages**
High complication rates (to both patients and the surgeons!!)
Not suitable for non-obstructive azoospermia (requires multiple firing!!)

Testicular Microdissection

Focal areas of seminiferous tubules that may have sperm.

Sperm retrieval rate with micro-TESE is 1.5 times (52% vs 35%) more likely than with TESE.

Sperm retrieval rate with TESE is 2.0 times (56% vs 28%) more likely than with TESA.

Bernie et al., Fertil Steril 2015
Testicular Microdissection

- Overall success rate of sperm retrieval in non-obstructive azoospermia: 40-62%

- Success correlates with histopathology (Ramasamy & Schlegel 2007)
  - Sertoli-Cell only: 45%
  - Early Maturation arrest: 40%
  - Late Maturation arrest: 78%
  - Hypospermatogenesis: 100%

- Duration of azoospermia: 16.3 yrs
- Sperm retrieval rate: 45%
- Fertilization rate: 80%
- Pregnancy rate: 45%

Sperm Retrieval

....is more than just *cracking nuts* for Reproductive Gynecologists

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