

MINIMALLY INVASIVE TESTICULAR SPERM RETRIEVAL IN NON-OBSTRUCTIVE AZOOSPERMIA: A COMPARATIVE SURGICAL REVIEW OF MICRO-TESE AND THE DAR AL BARAA N-TESE TECHNIQUE**¹Dr. Marwan Nayef Abdul Hamid, ²Dr. Majeda Al Yatama, ³Dr. Mohamed Al Sayed**¹Consultant Urologist, Dar Al Baraa Medical Center – Kuwait.²Consultant Gynecology, Obstetrics and Head of IVF Center, Dar Al Baraa Medical Center – Kuwait.³Senior Embryologist, Dar Al Baraa Medical Center – Kuwait.***Corresponding Author: Dr. Marwan Nayef Abdul Hamid**

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ABSTRACT

Surgical sperm retrieval is a fundamental component in the management of men with non-obstructive azoospermia. Microdissection testicular sperm extraction (micro-TESE) is practiced and provides satisfactory retrieval rates; however, it is associated with extensive surgical exposure, prolonged operative time, postoperative fibrosis, limited feasibility for repeat procedures, high cost and needs big instruments like surgical microscope with good training. To address these limitations, a minimally invasive sperm retrieval technique was developed at Dar Al Baraa Medical Center. This paper provides a comparative surgical review of micro-TESE and the Dar Al Baraa N-TESE technique, focusing on operative methodology, invasiveness, tissue preservation, repeatability, recovery time, and practical clinical implications. The Dar Al Baraa N-TESE technique demonstrates several procedural advantages, including reduced tissue trauma, shorter operative duration, rapid postoperative recovery, and the ability to safely repeat the procedure without long-term testicular damage no complicated instruments with long training and low cost. These findings support the role of minimally invasive approaches in optimizing patient outcomes in non-obstructive azoospermia.

INTRODUCTION

Non-obstructive azoospermia remains one of the most challenging conditions in male infertility. Surgical sperm retrieval has enabled many of these patients to achieve biological fatherhood through assisted reproductive techniques. Microdissection testicular sperm extraction (micro-TESE) has become the most commonly employed method.

The micro-TESE is associated with several disadvantages which mentioned above, These limitations have prompted the exploration of alternative surgical techniques that aim to preserve testicular structure while maintaining effective sperm retrieval.

The Dar Al Baraa N-TESE technique was developed as a minimally invasive alternative designed to reduce tissue trauma, shorten recovery time, and permit repeated sampling without long-term structural damage and

simplicity of approach .This article presents a comparative analysis of micro-TESE and the Dar Al Baraa N-TESE technique, highlighting key surgical and clinical differences.

Microdissection Testicular Sperm Extraction (Micro-TESE)**Surgical Technique**

Micro-TESE involves a relatively large scrotal incision with complete delivery of the testis. The tunica albuginea is widely opened, and seminiferous tubules are explored under high magnification using an operating microscope. This approach requires advanced microsurgical expertise and specialized equipment.

Surgical Characteristics

1. Extensive surgical exposure with a large tunical incision
2. High degree of invasiveness and tissue manipulation

3. Prolonged operative time due to meticulous microscopic dissection
4. Increased risk of postoperative fibrosis and reduction in testicular volume
5. Limited feasibility for multiple repeat procedures
6. Longer postoperative recovery period
7. Restriction of postoperative biological therapies such as PRP or stem cell applications
8. High operative cost due to equipment and operating-room requirements

Dar Al Baraa N-TESE Technique

Surgical Technique

The Dar Al Baraa N-TESE procedure is performed through a very small midline scrotal incision. The testis is gently exposed, and sperm retrieval is achieved through controlled, stepwise tissue sampling without wide dissection or microscopic magnification.

Four-Step Tissue Sampling Method

1. Minimal tunical opening – a small, precise incision is made in the tunica albuginea
2. Superficial sampling – gentle pressure allows superficial tissue to extrude naturally
3. Mid-level sampling – controlled pressure retrieves tissue from the mid-depth of the testis
4. Deep sampling – deeper tissue is obtained safely with controlled pressure, without extensive manipulation
5. This small testicular incision can be done in several parts of the tests (mapping) to take enough biopsies

Surgical Characteristics

1. Very short operative duration
2. Minimal invasiveness without the need for a surgical microscope
3. Multiple sampling sites achievable through small incisions
4. High repeatability without fibrosis or testicular volume loss
5. Rapid postoperative recovery, often with next-day return to work
6. Preservation of testicular architecture
7. Feasibility of postoperative PRP or stem cell therapy
8. Significantly lower operative cost

Comparison and Discussion

While micro-TESE is widely accepted technique, its invasive nature, prolonged operative time, and postoperative consequences limit its suitability for repeated procedures. The requirement for advanced microsurgical expertise and specialized equipment also increases cost and restricts accessibility.

The Dar Al Baraa N-TESE technique offers a simplified and less invasive alternative. By minimizing tissue trauma and preserving testicular structure, it allows rapid recovery and safe repeat interventions. These advantages make it particularly suitable for patients requiring

multiple sperm retrieval attempts or those seeking minimal postoperative morbidity.

Further prospective studies are warranted to compare sperm retrieval rates, long-term endocrine outcomes, and patient satisfaction between these two techniques.

CONCLUSION

Both micro-TESE and the Dar Al Baraa N-TESE technique represent valuable surgical options for sperm retrieval in non-obstructive azoospermia. However, the Dar Al Baraa N-TESE approach offers clear procedural advantages, including minimal invasiveness, shorter operative time, rapid recovery, absence of postoperative fibrosis, repeatability, and reduced cost. This technique highlights the importance of innovation aimed at reducing surgical harm while improving patient-centered outcomes.

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