IVF OUTCOMES USING SPERM RETRIVED VIA EXTENDED SPERM SEARCH (ESSM) VERSUS MICROSURGICAL TESTICULAR SPERM EXTRACTION (microTESE) AMONG PATIENTS WITH NON-OBSTRUCTIVE AZOOSPERMIA

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Background: Non-obstructive azoospermia (NOA), the absence of sperm in ejaculate due to spermatogenesis failure, is the most severe form of male infertility. Current sperm retrieval options for in-vitro fertilization (IVF) include microTESE and ESSM. However, microTESE has a reported success rate of 52% with unclear positive predictive factors and carries surgical morbidity.[1] ESSM represents a non-invasive option that uses laboratory techniques to cryopreserve individual sperm. There is no consensus on the efficacy of testicular versus ejaculated sperm to achieve fertilization for patients with NOA.

Objective: This study describes the incrementally increased success of sperm retrieval among patients with NOA or cryptoozospermia who undergo ESSM before microTESE compared to patients who undergo microTESE alone. Additionally, IVF outcomes among cycles using sperm retrieved via microTESE versus ESSM are analyzed.

Materials and Methods: This is a retrospective cohort study of patients with NOA or crytoozospermia who underwent microTESE or ESSM at a large urban academic center from 2018-2024. Study data were obtained from electronic medical records. Primary outcome was identification of sperm on microTESE or ESSM. Secondary outcome was IVF outcomes using sperm retrieved via microTESE versus ESSM. Statistical analysis included Chi-squared tests and multiple logistic regression with p-value <0.05 as significant.

Result(s): Of 74 patients with NOA or cryptoozospermia who underwent microTESE or ESSM, 29 underwent microTESE alone, and 45 underwent ESSM before microTESE. Overall, patients who had ESSM before microTESE had a higher success rate retrieving sperm than patients who underwent microTESE alone (76% vs. 48%; $p = 0.0164$). Notably, 64% (29/45) of patients overall and 38% (10/26) of patients with NOA found sperm on ESSM alone without undergoing microTESE. Patients with cryptoozospermia most benefit from ESSM as 100% (19/19) found success without needing microTESE. While ESSM is a net positive addition to the treatment protocol, 42% (5/12) of patients who failed initial ESSM still found sperm on subsequent microTESE. Among these 74 patients, 80% (59/74) patients underwent 86 IVF cycles, 54 of which used sperm from microTESE and 32 from ESSM. ESSM cycles had no significant difference in fertilization rate (2 pronuclear/total oocytes) versus microTESE cycles (0.45 vs. 0.53; p = 0.1773) and a higher embryo formation rate (embryo/2PN; 0.5 vs. 0.2; p = 0.0059). However, there was no significant difference in euploid rate (0.5 vs. 0.7; p = 0.1612). There were 21 frozen embryo transfers (FET) from ESSM cycles and 28 FETs from microTESE cycles, resulting in 9 total clinical pregnancies from ESSM cycles and 11 from microTESE cycles. There was no significant difference in FET outcome, including live birth/ongoing, biochemical, SAB, negative ($p = 0.8419$). The live birth rate (live births/FET) was 43% (9/21) for ESSM cycles and 39% (11/28) for microTESE (p = 0.8013).

Conclusion(s): Our proposed protocol of ESSM before microTESE yields a significantly higher sperm retrieval rate than microTESE alone and minimizes morbidity of surgery, with 38% of patients with NOA finding sperm on ESSM alone without undergoing microTESE. Reassuringly, there is no significant difference IVF outcomes using sperm retrieved via ESSM versus microTESE.

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References:

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