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Evaluation of Prognostic Factors and Determinants in Surgical Sperm Retrieval Procedures in Azoospermic Patients

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ABSTRACT

Introduction: Main categorisation of azospermia is in two groups: nonobstructive azospermia (NOA) and obstructive azospermia (OA). We had evaluation of prognostic factors and determinants in sperm retrieval procedures in azospermic patients. **Methods:** Retrospective evaluation observed 21 selected patients with NOA and OA azospermia, after that complete history, physical examination with ultrasound volume of testis and hormonal profile. Hormonal profile included: follicle stimulating hormone (FSH), luteinizing hormone (LH), testosterone (T) and prolactin (P) serum levels. Also karyotype and Y-deletion analysis were done and analyzed. **Results:** 9 OA patients (42,9%) were undergone for TESE operation and 12 NOA patients (57,1%) for Micro-TESE operation. All TESE procedures were positive (100%). Micro-TESE in 12 selected NOA patients, 5 patients (41,6%) were positive and 7 patients (58,4%) negative. Patients testicular size, serum FSH and testosterone level showed correlation in success of sperm retrieval procedures. **Conclusion:** TESE is elected procedure for obstructive azospermia (OA). Micro-TESE is appropriate sperm retrieval procedure for patients with non-obstructive azospermia (NOA) and correlate with high FSH and small volume of testis.

Keywords: Azoospermia, prognostic factors, Micro/TESE.

1. INTRODUCTION

Complete absence of sperm from the ejaculate is defined as Azoospermia. It is presented in about 1% of all men and presents 10-15% of infertile men (1, 2). Main categorisation of azospermia is in two groups: nonobstructive azospermia (NOA) and obstructive azospermia (OA). Due etiologies of azospermia it is categorized into three groups: pre-testicular, testicular and post-testicular. NOA is caused of impaired spermatogenesis in the testis (3). Post-testicular etiologies of azospermia (OA) is found in approximately 40% of patients and evaluation shows normal testicular morphology and volume, normal hormonal range of FSH, LH and Testosterone levels. Non-obstructive azospermia (NOA), is usually present with high plasma gonadotrophin levels especially FSH and small testis volume. In distinguishing these two groups of patients with azospermia we evaluate also medical history (previous surgery, mumps, undescended testicle), physical and ultrasound examination, genetic evaluation

(karyogram and Y-deletion) and main parameter hormone serum levels of FSH, LH, Testosterone and prolactin. New techniques have been used to obtain sperm, for OA such as testicular sperm aspiration (TESA), classical testicular sperm extraction (TESE) or open biopsy and neuvél microdissection TESE (micro-TESE) for NOA with use of operative microscope magnification. With these operative procedures we could effectively treat male infertility combined with intracytoplasmic sperm injection (IVF/ICSI).

Microdissection testicular sperm extraction (micro-TESE) are used for detection of small multilocular focal intraparechimal regions of preserved sperm production in enlarged seminal tubules of the testis patients with NOA. Success rate of this sperm retrieval method is 35–50%, but some more recent studies suggest that almost 60% of men with NOA have some sperm production in the testis (4, 5).

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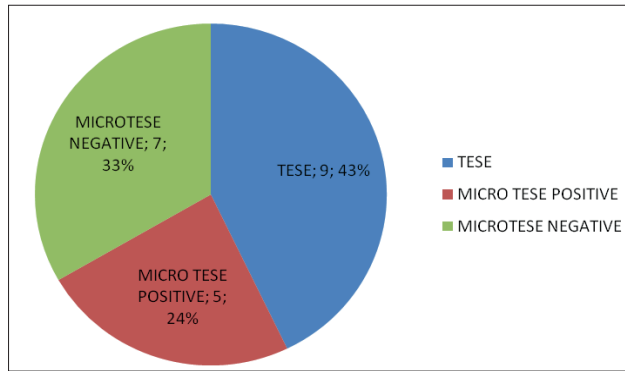


Figure 1. Sperm retrieval procedures Micro/TeSe.

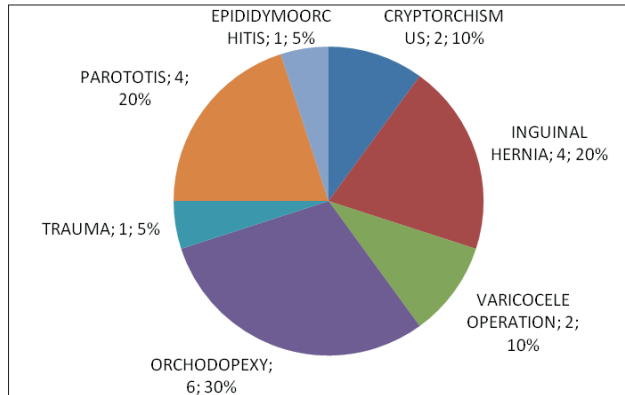


Figure 2. Prognostic determinants in azoospermic patients

2. PATIENTS AND METHODS

Retrospective evaluation observed 21 selected patients with nonobstructive and obstructive azoospermia with healthy female partners who had undergone micro/TESE in period of one year in IVF Bacheci Centre Sarajevo. Patients undergone treatment protocol for diagnosis of azoospermia. First semen samples were analysed, minimally two negativ founidng of azoospermia. After that complete history, physical examination with ultrasound volume of testis and hormonal profile. Hormonal profile included: follicle stimulating hormone (FSH), luteinizing hormone (LH), testosterone (T) and prolactin (P) serum levels. Also karyotype and Y-deletion analysis were done and analyzed. All patients were preoperatively treated with some supported therapy protocols. For OA we ordered nutritive suproth therapy, and for NOA hormonal treatment protocols (testosteron dep amp., clomifen tbl., 5000IU hCG or rhFSH 75IU sc.) at least tree to six months.

3. RESULTS

We have preformed in 21 selected case sperm retrieval operative techiques at Bahceci Sarajevo BiH IVF center during one year. 9 OA patients (42,9%) were undergone for TESE operation and 12 NOA patients (57,1%) for Micro-TESE operation. All TESE procedures were positive (100%). Micro-TESE in 12 selected NOA patients, 5 patients (41,6%) were positive and 7 patients (58,4%) negative (Figure 1).

Avrage age of patient with azoospermia were 36,52 ±6,47 years, range 28-43 years. We used correlation test between patients with positive and negative finding of

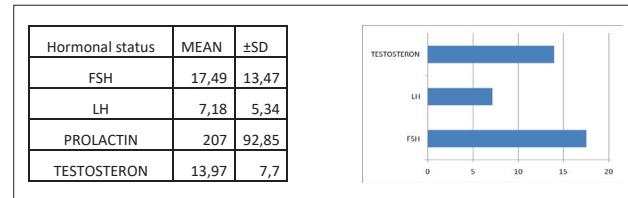


Figure 3. Hormonal serum levels as endocrinological determinant in azoospermic patients

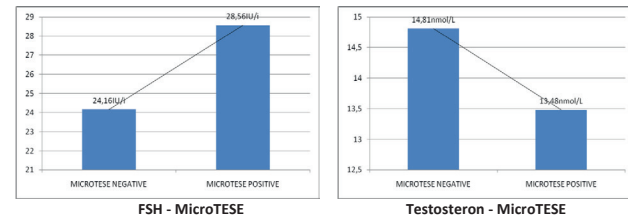


Figure 4. FSH and Testosteron serum levels in patients undergone Micro-TESE procedures

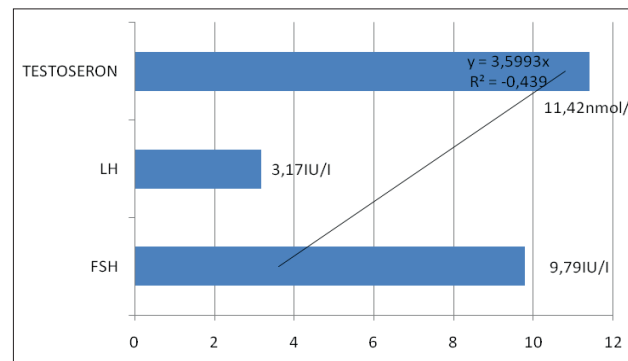


Figure 5. FSH, LH and Testosteron serum levels in patients(OA) undergone TESE procedures

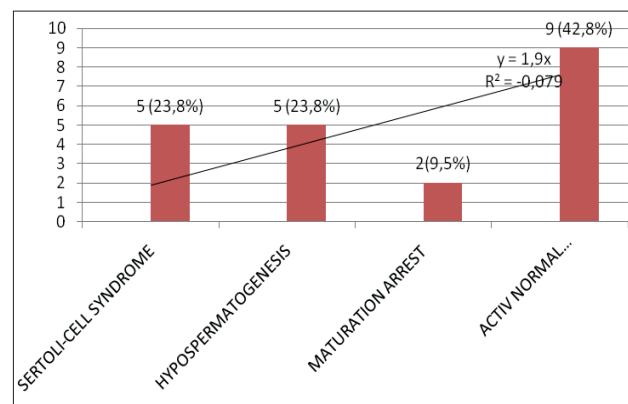


Figure 6. Patohistology reports of patients undergone sperm retrieval procedures

micro-TESE surgery, there was no statistically significant difference in age of patients ($p > 0,05$).

Known prognostic determinants in azospermic patients, previous operations orchidopexy 6 patients (30%), inguinal surgery hernia repair 4 patients (20%), and same number patients with mumps infection (parotitis), than 4 patients (10%) in two determinants cryptorchism and varicocele operations and 2 patients (5%) with trauma and epididymoorchitis infections (Figure 2).

Mean FSH level in patients with azoospermia was 17,49 IU/I, LH 7,18 IU/I and Testosterone serum level was 13,97 nmol/L. (Figure 3).

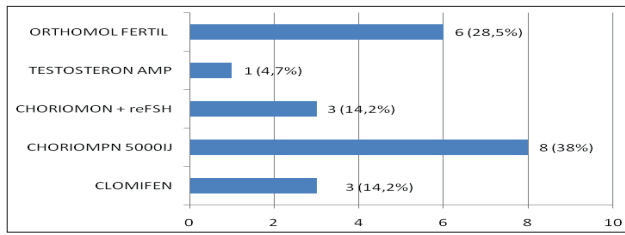


Figure 7. Therapy protocols of patients undergone sperm retrieval procedures.

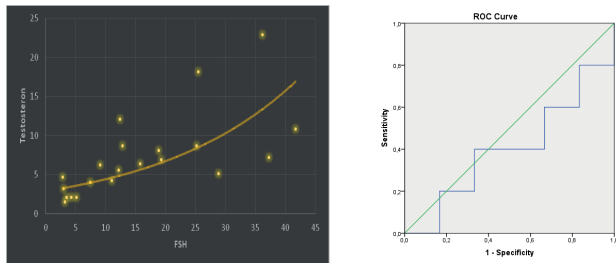


Figure 8. Correlation of FSH and Testosterone serum levels in patients undergone Micro-TESE procedures ($R = 0.669$; $p=0.001$; ROC sensitivity 0,333)

Ultrasound mesurment of testicular volumen showed smaller testicular volume (less than 15ml) in our group, right 11,45ml, left 10,11ml. 1 patients (4,7%) had Klinefelter syndrome all other kariograms were 46XY, also Y-deletions were not detected. In the group of patient undergone TESE operation 9 patients, 2 patients (22,2%) had retrograde ejaculacione and 1 patient (11,1%) had congenital bilateral aplasia of the vas deferens (CBA-VD) malformation.

4. DISCUSSION

In examined group of azoospermica patient with had use one of the sperm retrieval procedures, pozitiv results we had at 67% of patients. TESE was 100% positive and Micro-TESE positive result had 41,6% patients.

The standard for positive TESE procedure is 80-100% and for micro-TESE is about 50% whereas in recent studies the result is up to 60% (5, 6). Resent study from same group, prof.dr Ümit Göktolga et al. had 52,7% positive sperm retrieval rate (SRR), and we have to consider that our examined group is smaller 21 patients, than 55 patients early examined (7). Relationship between etiologic factors and determinants shows that most of patient had inguinal operations, orchidopexy or inginal canal repair (30%) and infections such parotitis and epididymoorchitis (20%) were in correlation with azoospermia in patients (8).

Mean FSH level in patients with azoospermia was 17,49 IU/I, LH 7,18 IU/I and Testosterone serum level was 13,97 nmol/L. High FSH serum level is in correlation with founding of azoospermic patients and mean value of FSH for TESE pateints is 9,79IU/I and for Micro-TESE 28,56IU/I (9, 10). By analyzing the correlation between the values of testosterone and FSH in the blood of the subjects with azoospermia a statistically significant positive correlation between the values of FSH and testoseron were established and it is significant ($p=0.001$). And analyzing the ROC curve, FSH was not statistically signifi-

cant marker for the outcome of pedicures of the outcome of the microtese operation, the cut off FSH value was 22.03 IU, with a marker sensitivity of 0.333 and a sensitivity of 0.600. Other studies showed that FSH had a poor predictive value for sperm retrieval by TESE (11, 12).

Testicular volumen showed smaller testicular volume (less than 15ml) in our group, right 11,45ml, left 10,11ml., and this indicate that smaller testicular volume were related to more severe spermatogenesis. This is confirmed by Ziaee at al. where the average testicular volume was 17.5 ml in NOA patients (13).

Another important determinant is founding of histopathology specimens. The results showed that histopathological diagnosis, activ normal spermatogenesis and hypospermatogenesis are correlated with TESE, while Sertoli cell syndrome (SCO)and spermatogenic arrest were correlated with MicroTESE operatins (9, 10).

5. CONCLUSION

Micro-TESE is appropriate sperm retrieval procedure for patients with non-obstructive azoospermia (NOA) and correlate with high FSH and small volume of testis. TESE is elected procedure for obstructive azospermia (OA). Patients testicular size, serum FSH and testosterone level showed correlation in success of sperm retrieval procedures.

- Conflict of interest: none declared.

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