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

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ABSTRACT

Introduction: Main categorisation of azospermic is in two groups: nonobstructive azoospermia (NOA) and obstructive azoospermia (OA). We had evaluation of prognostic factors and determinants in sperm retrieval procedures in azoospermic patients. Methods: Retrospective evaluation observed 21 selected patients with NOA and OA 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. 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 azoospermia (OA). Micro-TESE is appropriate sperm retrieval procedure for patients with non-obstructive azoospermia (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 azospermic is in two groups: nonobstructive azoospermia (NOA) and obstructive azoospermia (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 azoospermia (OA) is found in approximately 40% of patients and evaluation shows normal testicular morphology and volume, normal hormonal range of FSH, LH and Testosteron levels. Non-obstructive azoospermia (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 neuvel 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 patinets 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).
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 negative finding 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 amphi., clomifen tbl., 5000IU hCG or rhFSH 75IJ sc.) at least tree to six months.

3. RESULTS

We have preformed in 21 selected case sperm retrieval operative techniques 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).

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

Known prognostic determinants in azoospermic 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 cryptorchismus 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).
Ultrasound measurement of testicular volume 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 ejaculatone and 1 patient (11.1%) had congenital bilateral aplasia of the vas deferens (CBA-VD) malformation.

4. DISCUSSION

In examined group of azoospermia patient with had use one of the sperm retrieval procedures, positive 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 etiological factors and determinants shows that most of patient had inguinal operations, orchidoeiplxy 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/L, LH 7.18 IU/L 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 patietns is 9.79IU/L and for Micro-TESE 28.56IU/L (9, 10). By analyzing the correlation between the values of testosteron and FSH in the blood of the subects with azoospermia a statistically significant positive correlation between the values of FSH and testosteron were established and it is significant (p=0.001). And analyzing the ROC curve, FSH was not statistically significant 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 volume 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 operations (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 one level showed correlation in success of sperm retrieval procedures.

conflict of interest: none declared.

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