Successful reversal of necrozoospermia with course of antibiotic

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Abstract
This case report presents a case of secondary infertility, where the male was diagnosed with 100% necrozoospermia for nearly a year through several laboratory analyses and the couple has been seeking IVF treatment during that span of time. Upon referral, the andrologist diagnosed the presence of epididymitis and patient was placed on a course on antibiotics and antioxidants. Subsequent semen analysis after the treatment course showed considerable improvement of semen parameters. In this case, infection is one of the many causes of necrozoospermia and it is important for IVF professionals to assess the cause before proceeding for any invasive treatment for sperm retrieval for therapeutic treatment.

Keywords: Infertility, Epididymitis, Necrozoospermia

1. Introduction
Necrozoospermia, i.e. 100% immotile and 0% viability spermatozoa in ejaculate, is rare and a poorly documented case of male infertility. The precise incidence of necrozoospermia as such is difficult to ascertain, however some authors reported that among infertile subjects the incidence is between 0.2 to 0.5 percent (Tournaye et al., 1996). Up to date, no precise cellular defects in regards to necrozoospermia has been defined, however literature search shows that metabolic defects (Ludvik et al., 1971), male accessory-gland infection (MAGI) and chronic prostatitis, testicular and/or epididymal abnormalities (i.e. hypogonadotropic hypogonadism), antisperm antibodies, prolonged periods of anejaculation, hyperthermia, in situ carcinoma of the testis, advanced age, exposure to toxic products or drug addiction may also produce necrozoospermia (Lecomte et al., 1999). Literature search shows that in most cases of necrozoospermia, surgical testicular sperm retrieval is a favored practice to find viable and motile sperm for intracytoplasmic injection of the oocyte. In management of necrozoospermia, it is important to elucidate its nature and, if possible, correct the potential causes.
2. Case report

The case presented here is of a 49 year old male referred to the Department of Urology from the IVF Clinic in our hospital. His female partner was 42 yrs old with arcuate uterus and presence of fibroid. They have been married for 15 yrs. The chief complaint was secondary infertility with left chronic orchielgia as assessed by the IVF physician. On examination, the volume of both testes was normal. There was no hydrocele or varicocele. There was pain and tenderness of left epididymis.

The patient underwent a series of laboratory investigations: Complete blood count, urine analysis (negative), urethral culture and sensitivity tests (negative), hormonal assays FSH, LH, testosterone, and thyroxine which were all within the normal range. The semen analysis done as per the World Health Organization criteria, 5th edition (2010) included quantitative and qualitative assessments as well as microscopic examination. The quantitative parameters included the following: volume (ml), concentration (M/ml), motility (%), total motile sperm (M), morphology assessment (% normal) and viability test (%). Viability testing was done using eosin-nigrosin stain. The principle of the vitality stain is that intact live cells exclude eosin, whereas dead cells take up the red color of eosin. Nigrosin is used as a counterstain to facilitate visualization of the unstained (white) live cells (Mortimer 1994).

Table 1. The results of the semen analyses are shown in the table below.

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Date</th>
<th>Vol(mL)</th>
<th>Conc.(M/mL)</th>
<th>Total Sperm Conc. (M)</th>
<th>Total Motile (M)</th>
<th>Motility (%)</th>
<th>Morph (%)</th>
<th>Vital Stain (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>04/2014</td>
<td>5.5</td>
<td>11</td>
<td>60.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>05/2014</td>
<td>6.5</td>
<td>0.002</td>
<td>0.013</td>
<td>0</td>
<td>0</td>
<td>No Morph</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>03/2015</td>
<td>5</td>
<td>19.1</td>
<td>95.5</td>
<td>38.2</td>
<td>40</td>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>

The patient was placed on a course doxycycline 100 mg bid for 2 weeks and Fertil-Pro as antioxidants therapy.

Fig.1. Microscopic image sperm.

A; non-viable sperm cells, B; Viable sperm cell-white

Semen analysis performed after one month showed the presence of motile and viable spermatozoa and 1% normal morphology, i.e. the third reading in the table 1, is after the course of treatment. As of writing this case report, the male partner has provided a sample with motile and viable sperm to be used for the intra-cytoplasmic injection of the oocytes to be retrieved from his partner.
3. Discussion

Necrozoospermia is a clinical state in which 100% of ejaculated sperm are immotile and proven dead by viability testing. Most assisted reproductive clinics and professionals, at some point will deal with such cases. There are no controlled studies on the treatment of chronic epididymitis. The above patient had all the semen parameters indicated in case of chronic epididymal inflammation. After an antiphlogistic approach with doxycycline which has bacteriostatic effect and with antioxidant therapy, the third semen analysis showed considerable improvement in all parameters that have been assessed previously. Motile and viable sperm cells were present and a morphology score of 1 % (normal: ≥ 4%). The patient’s case is an indication of epididymal necrozoospermia that is sperm degeneration and death occurs during epididymal passage or storage or both due to the hostile environment prevalent at that time. The epididymal compartment is for development of sperm motility, sperm membrane modifications for achievement of fertilizing capacity. Inflammatory lesions of the epididymis results epididymal dysfunction causing obstruction within the epididymis (Haidl et al., 2008) and is associated with the presence of sperm antibodies.

Many IVF physicians suggest and favor surgical testicular sperm retrieval to find viable and motile sperm for therapeutic procedures in necrozoospermic patients. However, in one study authors have suggested frequent ejaculation to deplete epididymal sperm reserves and reduce the time spent in the epididymis, which results in motile sperm in the ejaculate (Wilton et al., 1998). A retrospective study concluded that necrozoospermia has no negative effect on fertilization and cleavage rate when compared to TESE sperm however a negative correlation was seen in implantation, clinical pregnancies and live births (Negri et al., 2014). Another recent study in 2015 has come to the conclusion that neither the source of spermatozoa nor the etiology of severe male infertility has relevant impact on the results of ICSI cycles as long as motile and morphologically normal spermatozoa are used (Gnoth et al., 2015). From our clinical case, it is obvious that before proceeding and suggesting for invasive testicular retrieval, the IVF team should investigate all the possible causes of necrozoospermia and treatment approach. Based on the latest scientific and medical evidences proper counselling should be provided to the patient with regards to which approach is best suitable for the sperm recovery to use in oocyte injection.

4. Conclusion

In conclusion from our case and the literature we can say that there is no set of guidelines or consensus for retrieval of viable sperm for IVF treatment when it is related to severe male infertility such as necrozoospermia due to chronic epididymitis. Definitely, ICSI outcome depends on many other variables such as oocyte quality and female’s partner age. Finally, we can conclude that in necrozoospermic patients, an andrological comprehensive work-up is essential, as necrozoospermia has a heterogeneous pathogenesis and if the cause is treatable as seen in this clinical case and with a favorable prognosis, then invasive testicular biopsy can be altogether avoided. However, in cases where the cause is at genetic and molecular level and no treatment is available, testicular retrieval and intracytoplasmic injection of the retrieved sperm will still be the favored alternative option.

Conflict of interest statement

We declare that we have no conflict of interest.
References


