

HOSTED BY



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ajur



REVIEW

Testis sperm extraction



Kirsten J.C. Janosek-Albright^a, Peter N. Schlegel^b,
Ali A. Dabaja^{a,*}

^a Department of Urology, Vattikuti Urology Institute, Henry Ford Hospital, Detroit, MI, USA

^b Department of Urology, Weill Cornell Medical College, New York, NY, USA

Received 22 October 2014; received in revised form 25 November 2014; accepted 5 December 2014

Available online 16 April 2015

KEYWORDS

Non-obstructive azoospermia;
Microdissection testicular sperm extraction;
Fine needle aspiration;
Sperm retrieval

Abstract The last 20 years have produced developments in the treatment for patients with non-obstructive azoospermia (NOA) who were once considered to be infertile. The combination of intracytoplasmic sperm injection together with various testicular sperm retrieval techniques, including conventional testicular sperm extraction (TESE), microdissection TESE (micro-TESE) and fine needle aspiration (FNA), have revolutionized treatment for these men. In men with NOA, isolated regions of spermatogenesis within the testis are common. The goal for all types of sperm retrieval procedures is locating the focal region(s) of spermatogenesis, and harvesting the sperm for assisted reproduction. This review article explores the surgical management of men with NOA and describes all techniques that can be used for testicular sperm retrieval. A PubMed search was conducted using the key words: “sperm extraction”, “NOA”, “testicular FNA”, “testicular mapping”, “TESE”, and “testicular biopsy”. All articles were reviewed. Articles were included if they provided data on sperm retrieval rates. The methods for performing sperm retrieval rates and outcomes of the various techniques are outlined. Micro-TESE has a higher sperm retrieval rates with fewer postoperative complications and negative effects on testicular function compared with conventional TESE.

© 2015 Editorial Office of Asian Journal of Urology. Production and hosting by Elsevier (Singapore) Pte Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Approximately 10% of infertile men have non-obstructive azoospermia (NOA) and 60% of azoospermic men are diagnosed with NOA [1]. Dramatic advances in the last 20 years

have been made in treatment options of NOA. In the past, the only options for treating men with NOA were donor insemination or adoption. The theoretical basis for attempting to retrieve spermatozoa from the testes in men with azoospermia is based on early histological studies that

* Corresponding author.

E-mail address: adabaja2@hfhs.org (A.A. Dabaja).

Peer review under responsibility of Chinese Urological Association and SMMU.

noted spermatids in infertile men [2]. The testes of infertile men have a mixed histological pattern of focal areas of complete spermatogenic development in a background of germinal cell aplasia [3]. The development of intracytoplasmic sperm injection (ICSI) paired with the practicality of retrieving viable sperm from the testes of NOA patients led to the development of fertility treatments for these patients [4].

There are several etiologies for testicular failure that leads to NOA, including genetic disorders (e.g., sex chromosome abnormalities, translocations or Y chromosome microdeletions), cryptorchidism, radiation and/or gonadal toxins. Despite the different causes for testicular failure, the goal for sperm retrieval is always finding the focal area of spermatogenesis. There are several approaches for sperm retrieval including fine needle aspiration (FNA), percutaneous testicular biopsy, open testicular biopsy (testicular sperm extraction (TESE), which includes multiple TESE), and microdissection TESE (micro-TESE). This review article will describe the technical aspects of testicular sperm retrieval and highlight the sperm retrieval rates (SRR) and outcomes of these procedures.

2. Evidence acquisition

A PubMed search was conducted on February 15 2014 using key words: "sperm extraction", "non-obstructive azoospermia", "testicular fine needle aspiration", "testicular mapping", "testicular sperm extraction", "testicular biopsy". English language articles were reviewed for inclusion. Articles were included if they provided data on SRR.

3. Evidence synthesis

3.1. Indication for surgery

In azoospermia, sperm retrieval is possible through both open and percutaneous surgical approaches. In obstructive azoospermia, sperm is usually harvested from the epididymis. Testicular sperm extraction is reserved for when epididymal sperm extraction fails, and it is the only option for sperm retrieval in men with NOA.

3.2. Preoperative preparation

To confirm the diagnosis of azoospermia, the semen sample should be centrifuged and the pellet should be examined under the microscope, up to 35% of men who were diagnosed with NOA may in fact have sperm in the ejaculate [5]. A thorough history and physical examination should be performed on all men with NOA. In addition, hormonal evaluation and genetic testing should be offered, specifically karyotype analysis and Y microdeletion. On physical examination, men with NOA have small testes and flat non-indurated epididymides. On hormonal testing, elevated follicle stimulating hormone (FSH) greater than 7.0 mIU/mL is common and variable levels of serum testosterone (T) are seen. The etiology of NOA will be elucidated in up to 17% of men with genetic testing [6]. Genetic testing also provides prognostic information for counseling patients about their prognosis and the possibility of passing a genetic defect to

their offspring if they proceed with *in vitro* fertilization. For instance, men with the AZFc deletion or Klinefelter's Syndrome have good prognosis. Men with complete AZFa or AZFb have little to no chance of sperm retrieval [7]. Men with AZFc deletion should be counseled about passing on the genetic defect to their offspring.

3.3. Prior to surgical intervention

Optimization of spermatogenesis prior to sperm retrieval should be attempted in couples where the female age permits. Simple changes in life style habits such as smoking cessation is advised for the male partner might improve their fertility potential. Medical treatment is effective and recommended for men with hypogonadotropic hypogonadism; therefore, it will often obviate the need for sperm retrieval surgery.

Hormonal manipulation has a role in increasing endogenous production of testosterone and normalizing the testosterone/estrogen ratio in men with clear hypogonadism. Hormonal therapy includes clomiphene citrate, aromatase inhibitors, and human chorionic gonadotropin [8]. Klinefelter's Syndrome patients with a low serum T, which increases to greater than 250 ng/dL with medical therapy, have a higher SRR with micro-TESE [9]. Selective estrogen receptors modulators (SERMs) have been shown to be associated with improving sperm production in men with NOA; however, well-designed trials demonstrating its benefit are lacking [10]. Men with NOA and testicular histology showing hypospermatogenesis [11], men who failed initial micro-TESE but before a repeat micro-TESE [12], might benefit from a trial of gonadotropins. Additionally, patients diagnosed with NOA and hypospermatogenesis on histologic examination and received gonadotropins have better SRR even when selective estrogen receptors modulators therapy fails to raise testosterone [13]. Patients with NOA may benefit from clomiphene with normal T.

In a study by Pavlovich et al. [14] men with severe male infertility were characterized as having a T to estradiol (E) ratio of 6.9, whereas men with normal spermatogenesis had a mean T/E ratio of 14.5. Therefore, 10, is proposed as the lower limit of normal T/E ratios in men. Clinical studies of aromatase inhibitors have focused on men with defective spermatogenesis associated with low serum T levels and abnormal T/E ratios. Most of the studies focused on men who had abnormal T/E ratio and it is difficult to draw any conclusion on the use of aromatase inhibitors in men with normal ratio.

The benefit of varicocelectomy in NOA prior to sperm retrieval is limited. Varicocelectomy in patients with NOA resulted in less than 10% that had adequate sperm in the ejaculate obviating the need for subsequent TESE [15]. A single diagnostic biopsy provides a very limited evaluation of the testicle and does not predict SRR because of known heterogeneity of spermatogenic patterns in NOA. Therefore, negative biopsies should be interpreted with caution and patients with NOA may need repeat surgical sperm retrieval [16].

3.4. Percutaneous sperm retrieval

Percutaneous testicular aspiration or biopsy can be performed in the office under local anesthesia, which is less

Download English Version:

<https://daneshyari.com/en/article/3853276>

Download Persian Version:

<https://daneshyari.com/article/3853276>

[Daneshyari.com](https://daneshyari.com)