



## TESTICULAR HISTOPATHOLOGICAL PATTERNS OBSERVED IN INFERTILE MEN WITH AZOOSPERMIA

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**ABSTRACT** **Objective:** To identify and categorize various histopathological patterns seen in testicular biopsies of males with infertility who presented to our institute **Materials and Methods:** All testicular biopsies from males with infertility received by referral to the andrology clinic in Institute of urology, madras medical college in the period from June 2020 until June 2023 are reviewed and histopathologically classified into four categories as follows : Normal spermatogenesis, hypospermatogenesis, maturation arrest , Sertoli cell only syndrome **Results:** 52 testicular biopsies were performed in the studied period. The age of patients ranged from 27-47years with a mean age of 27.5 years. The histopathological patterns were as follows: 10 cases were reported as normal spermatogenesis;19 cases as hypospermatogenesis; and 19 cases were reported as maturation arrest, 4 cases with Sertoli cell only syndrome **Conclusion:** Our study showed that hypospermatogenesis is the commonest pattern in testicular biopsies taken from males with infertility in our region. This study supports the recommendation of bilateral testicular biopsies when investigating male infertility.

**KEYWORDS :** Hypospermatogenesis, male infertility, testicular biopsy

### INTRODUCTION

Infertility is defined as inability to conceive after 12 months of regular unprotected intercourse.[1] Although male infertility is a major cause of infertility among couples, contributing to more than half of all cases of infertility,[2][3] investigations of couple infertility have always concentrated on female pathological causes while male clinical conditions leading to infertility are still generally underdiagnosed and undertreated. The evaluation of the infertile male includes a thorough clinical history taking and physical examination, semen analysis, hormonal assay, and search for antisperm antibody. Additional tests include transrectal ultrasonography, vasography and testicular biopsy. The latter is particularly useful in cases of azoospermia or oligospermia and normal endocrine function.[4][5]

### MATERIALS AND METHODS

We retrospectively analyzed the records of 52 infertile men with azoospermia who presented to our Institute for evaluation of infertility.

#### Inclusion Criteria

- 1) Men with non obstructive azoospermia
- 2) Men with non obstructive azoospermia with previous failed testicular aspiration

#### Exclusion Criteria

Karyotyping was performed in all patients and patients with microdeletions of AZFa, AZFb, AZFb, AZF abc were excluded

#### Clinical History

A general and genital physical examination, scrotal and trans-rectal ultrasound, semen analysis, Hormone measurements, including FSH, LH and total testosterone, were collected karyotyping done in all patients

#### Surgical Procedure

Performed under IV sedation anaesthesia. The spermatic cord and the scrotal skin were infiltrated with local anaesthetic. The testicle on which the procedure was started was the one with larger volume. A small (5 mm) horizontal incision of the albuginea with extrusion of the testicular parenchyma and scissors biopsy of approximately 5x2x3mm were performed. The fragment was washed in buffered medium with 2.5% human serum albumin fixed in Bouin's solution (1 ml). All histological examinations were performed by the same pathologist and the same laboratory.

Histology[7] was classified into:

- Normal spermatogenesis;
- Hypospermatogenesis (reduction in the number of normal spermatogenic cells);
- Maturation arrest (absence of the later stages of spermatogenesis);
- Sertoli cell only (absence of germ cells)

### RESULTS AND OBSERVATION

52 testicular biopsies were performed in the studied period. The age of patients ranged from 27-47years with a mean age of 27.5 years. BMI ranged from 23.51 kg/m<sup>2</sup> to 30.32 kg/m<sup>2</sup>. FSH values ranged from 8.28 to 13.42 mIU/ml. LH values ranged from 6.32 to 8.25 mIU/ml. Testosterone values ranged from 4.12 to 4.57 ng/ml.

According to histology, 19.23% had normal spermatogenesis, (n=10), 36.5% hypospermatogenesis, (n=19), 35.3% maturation arrest (n=19), 7.69% Sertoli cell-only syndrome. (n=4).

HISTOLOGY PATTERN	N(%)
Normal spermatogenesis	10 (19.23%)
Hypospermatogenesis	19 (36.5%)
Maturation arrest	19 (36.5%)
Sertoli cell-only syndrome	4 (7.69%)

### DISCUSSION

Causes of male infertility are divided into three major categories: pretesticular, testicular and post-testicular causes.[9] The pretesticular causes of infertility include endocrine disorders originating in hypothalamus, pituitary or adrenals, chronic illnesses including diabetes mellitus and hypertension, as well as certain medications. [5] The testicular causes include defects in the process of spermatogenesis and post-testicular causes include obstructions of ducts draining the testes, related to trauma, surgery or mumps orchitis.[9] The distinction between post-testicular obstructive and pretesticular or testicular nonobstructive causes of male infertility is important since men with obstructive etiologies may have other cost effective options for treatment, such as microsurgical reconstruction of the reproductive tract.[10]

Testicular biopsy remains the key investigation for all testicular causes of infertility.[11] It is not the only parameter for determining the testicular histopathology pattern but apparently the strongest indicator to foresee the possibility of finding sperms in the testis for therapeutic sperm retrieval in assisted reproductive techniques.[11,12] Testicular biopsy can be performed under local or general anesthesia and compromise either a transcutaneous needle or open biopsies from one or more sites. Since the nature of various lesions may differ from one testis to another and heterogeneous pathological patterns are common, it is recommended to obtain bilateral testicular biopsies when studying male infertility[6]

#### Indications of Testicular Biopsy(Diagnostic)

Azoospermia with suspected obstruction as the cause normal testicular size and consistency normal FSH levels  
Suspected testicular failure(occasionally) small volume testis, high FSH Not indicated in the initial diagnostic evaluation of infertile men

Indications of TESE are:

Failure to find sperm in the epididymis in the presence of spermatogenesis Complete absence of epididymis Non obstructive

**CONCLUSION**

Predictors of successful sperm retrieval are higher testicular volume, lower levels of FSH, better histological features. Testicular histopathology after testicular biopsy offers important information on prediction of sperm retrieval and can guide the surgeon in choosing the more suitable therapeutic practice.

This study outlines the different patterns of testicular biopsy in cases of male infertility encountered in our region and identifies hypospermatogenesis as the most common pattern of spermatogenic defect among the different studied patterns. This study has also shed some light on the possible underlying etiologies for such defects in spermatogenesis and stresses the need for bilateral testicular biopsies as well as the need for meticulous pathological examination of all seminiferous tubules in order to identify mixed and discordant patterns.

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