

## **A Study on the Role of Fine Needle Aspiration Cytology of Testes in Azoospermia**

Rajaram Thiagarajan<sup>1</sup>, Balaji A.R<sup>2</sup>, Vetrichandar<sup>3</sup>, Venkat karthy<sup>4</sup>, Jagatheswaran Chinnathambi<sup>5</sup>

<sup>1,2,3,4,5</sup>(Department of urology, Govt Stanley medical College, India)

---

**Abstract:-** Male infertility is a common problem<sup>1,2</sup>. It can be devastating to a couple trying to conceive. Statistics reveal that 15 % of all marriage in future faces the problem of infertility<sup>1-4</sup>. A study of semen analysis and testicular biopsy was done in 42 azoospermic male.. The main aim of the study was to evaluate the cytological features of testicular FNAC in azoospermia and to study the correlation between cytological and histological diagnosis. The need for bilateral FNAC was also evaluated. In FNAC the most common diagnosis was maturation arrest (49%). Considering the histopathology as the gold standard for correct diagnosis, the correlation of FNAC with histopathology was 86 % ( p value 0.801). Our study showed an overall sensitivity of 86.7%, specificity of 97.2%, positive predictive value of 91.4% and negative predictive of 96.2%. No major complication was encountered during the procedure. Similarly there was also good correlation (88%) between the FNAC reports of right and left testes. This emphasizes the fact that unilateral FNAC is more sufficient than for the evaluation of FNAC.

**Key words:-** Azoospermia, Fine needle aspiration cytology, Infertility.

---

### **I. INTRODUCTION**

Male infertility is a common problem that can be devastating to a couple trying to conceive. The statistics of infertility shows that 15% of all marriages face in future the problems of infertility. The WHO has reported a core global prevalence of 5% infertility in the mid 70s, in a multi-centric epidemiological study on infertility in various countries including India. <sup>[1],[2]</sup> In approximately 30% of cases, significant abnormalities are found in the man alone, in another 20% of the cases abnormalities are found in both the man and the woman. Thus in roughly 50% of infertile couples, the male factor is at least partially responsible for the failure to conceive.

Testicular biopsy can help us to differentiate a post-testicular, obstructive etiology of male infertility from an intrinsic testicular cause. <sup>[5]</sup> When post-testicular azoospermia or severe oligospermia is demonstrated, surgical correction may be indicated. [2,3]

Another alternative to open testicular biopsy is the fine needle aspiration cytology (FNAC) method for obtaining material for cytological evaluation of spermatogenesis and interstitial cells. Fine needle aspiration cytology (FNAC) of the testis is being increasingly used as a minimally invasive method of evaluating function<sup>[5,6]</sup>.

We have done this study to evaluate the efficacy of fine needle aspiration cytology (FNAC) as compared to open testicular biopsy in the evaluation of male infertility. We have also studied the necessity of bilateral or unilateral FNACs in the workup of the infertile man.

### **AIMS AND OBJECTIVES:-**

To evaluate cytological features of testicular FNAC in patients with azoospermia

To determine the diagnostic and reliability of testicular FNAC as a cytological sampling technique in azoospermia

Considering histopathology as the gold standard to study the correlation between cytological and histological diagnosis

To evaluate the possibility of replacing biopsy of azoospermia testes by FNAC for diagnostic purpose

To study the need for bilateral FNAC of the testes in the workup of the azoospermia.

## II. MATERIAL AND METHODS

Study design: prospective study

Setting: Govt. Stanley Medical and Hospital, Chennai.

### Inclusion Criteria:

1. Patients who fitted into the inclusion and exclusion criteria were Infertile men with two consecutive semen samples showing azoospermia: tests done at least two weeks apart
2. Exclusion criteria:
3. Infertile men with only a single sample showing azoospermia
4. Infertile men with normal sperm counts or oligospermia
5. Infertile men with azoospermia in whom testicular biopsy / FNAC is contraindicated due to causes like bleeding diathesis, infection etc.

**A total of 42 enrolled in the study after getting a proper informed consent.**

### Methodology:

All infertile men with two successive samples showing azoospermia attending the urology OPD from June 2006 to June 2008 are included in the study. The patients are investigated with hormonal assays, scrotal USG in addition to routine investigation. Patients were then subjected to FNAC of both testes for cytological evaluation and open testicular biopsy was done for histopathological correlation. Considering histopathological examination as the gold standard, in case of discordance between the FNAC reports of both testes, the one that correlated with the histopathological report was considered for statistical analysis.

## III. RESULTS AND DISCUSSION

Age The mean age in our study was 31.83 years with a range of 25 to 43 years.

Duration and the type of infertility:

Majority of patients presented 1-4 years after marriage with a mean duration of 5.72 years.

History

The majority of patients did not have any significant history (71.4%)

**Table No 1.0- History of risk factor for infertility among study population**

History	Present study
Nil significant	71.4%
Mumps orchitis	14%
Inguinal / scrotal surgery	4.80%

This is comparable to study done by Khaled Madbouly et al. The majority of patient presented without any antecedent cause for infertility in both study<sup>[11]</sup>. Mumps orchitis was seen in only 2 % of subjects in Khaled et al unlike ours where it was seen in 14 %.<sup>[12]</sup>

### 1. Testicular size and varicocele

**Table no 2:- Frequency distribution of testicular size and varicocele.**

Physical examination	Present study
Normal sized testes (>18 cc)	86%
Unilateral varicocele	14%
Bilateral varicocele	9.6%

### 2. Hormone levels

The mean testosterone, FSH and LH values in the present study were 5.41 ng/ml, 7.94mIU/ L, 6.58 mIU/L respectively.

**Table No 3:- Mean hormone levels in study population.**

Hormone levels	Present study
Testosterone	5.41
FSH	7.94
LH	6.58

5. FNAC – cytological types

The most common cytological type was maturation arrest (49%)

**Table No 4:- Distribution of FNAC findings in the study population**

Study	Normal spermatogenesis	Hypo spermatogenesis	Maturation arrest	Sertoli Cell Syndrome	Tubular hyalinization
Present study	11.90%	14.30%	49%	9.60%	9.60%

The concordance rate between cytological findings of right and left testes was 88% in this study  
Correlation between FNAC of Right and Left testes.

**Table No 5:- Comparison between the FNAC findings between the right and left testis**

.FNAC Lt testes		Normal	Hypo spermatogenesis	Maturation arrest	others
FNAC Rt testes	Normal	5	0	0	0
	Hypo spermatogenesis	0	4	1	1
	Maturation arrest	0	1	19	0
	others	0	1	1	9
Total		5	6	21	10

These findings suggest that in a patient undergoing Testicular FNAC for azoospermia, the findings between right and left testis were comparable. Hence it may be more than sufficient to limit the FNAC to just one testes.

**7. Correlation between testicular FNAC and Histopathology**

The correlation between FNAC and histopathology in our study was 86%.

**Table No 6:- Comparison of testicular biopsy with FNAC of Lt testes**

Biopsy		Normal	Hypo spermatogenesis	Maturation arrest	others	
FNAC Lt testes	Normal	5	0	0	0	5
	Hypo spermatogenesis	1	4	1	0	6
	Maturation arrest	0	3	18	0	21
	others	0	2	0	8	10
Total		6	9	19	8	42

**Table No 8:- Comparison of Testicular biopsy with FNAC Rt testes**

Biopsy		Normal	Hypo spermatogenesis	Maturation arrest	others	Total
FNAC Rt testes	Normal	5	0	0	0	5
	Hypo spermatogenesis	0	4	2	0	6
	Maturation arrest	0	4	16	0	20
	others	1	1	1	8	11
Total		6	9	19	8	42

The above table show that there is good correlation between FNAC findings of both testes taken separately and the histopathological reports. The difference between FNAC of right testes and HPE was not significant. (P value of < 0.453).<sup>[6]</sup> The same was also noted for FNAC of the left testes. (P value < 0.261).<sup>[10]</sup>

### 8. Correlation between sperm count and HPE

In this there was 64.3% correlation between HPE diagnosis and sperm count.

**Table No 9:- Correlation between sperm count and HPE**

Present study	
No : of cases	Percentage
27	64.3%

## IV. CONCLUSION

The technique of testicular FNAC is simple, inexpensive and minimally traumatic. More than 1 specimen can be taken safely.

Testicular FNAC gives an accuracy of 91.9% in the diagnosis of patients with male infertility. The material aspirated by FNAC is adequate and the various cell types can be identified by their distinctive morphology. This study proves that FNAC can evaluate accurately all classically defined histologic types. FNAC obtained insufficient smears mainly in atrophied testes.

The accuracy of diagnosing normal spermatogenic activity in obstructive azoospermia by FNAC was 100%.

For evaluating the spermatogenic activity in male infertility it appears that a unilateral FNAC or biopsy is sufficient for diagnosis. Bilateral FNACs and biopsies can be restricted to patients in whom there is appreciable difference in testicular size or consistency.

## REFERENCES

- [1] Bayasgalan G, Naranbat D, Tsedmaa B, Tsoigmaa B, Sukhee D, Amarjargal O, *et al.* Clinical patterns and major causes of infertility in Mongolia. *J Obstet Gynaecol Res* 2004;**30**:386–93.
- [2] Jarow JP, Espeland MA, Lipshultz LI. Evaluation of the azoospermic patient. *J Urol* 1989;**142**:62–5.
- [3] Altay B, Hekimgil M, Cikili N, Turma B, Soydan S. Histopathological mapping of open testicular biopsies in patients with unobstructive azoospermia. *BJU Int* 2001;**87**: 834–7.
- [4] World Health Organization. *WHO laboratory manual for the examination of human semen and sperm–cervical mucus interaction*. 4th ed. Cambridge:Cambridge University Press; 1999.
- [5] Meng MV, Cha I, Ljung BM, Turek PJ. Testicular fine-needle aspiration in infertile men: Correlation of cytologic pattern with biopsy histology. *Am J Surg Pathol* 2001;**25**:71–9.
- [6] Dada R, Gupta NP, Kucheria K. Molecular screening for Yq microdeletion in men with idiopathic oligozoospermia and azoospermia. *J Biosci* 2003;**28**:163–8.
- [7] Marmar JL. Modified vasoepididymostomy with simultaneous double-needle placement, tubulotomy and tubular invagination. *J Urol* 2000;**163**:483–6.
- [8] Tarlatzis BC, Bili H. Intracytoplasmic sperm injection: Survey of world results. *Ann N Y Acad Sci* 2000;**900**:336–44.
- [9] Zech H, Vanderzwalmen P, Prapas Y, Lejeune B, Duba E, Schoysman R. Congenital malformations after intracytoplasmic injection of spermatids. *Hum Reprod* 2000;**15**:969–71.
- [10] The Male Infertility Best Practice Policy Committee of the American Urological Association, and The Practice Committee of the American Society for Reproductive Medicine. Report on management of obstructive azoospermia. *Fertil Steril* 2004;**82** (Suppl 1):S137–S141.
- [11] Krausz C, McElreavey K. Y chromosome microdeletions in ‘fertile’ males. *Hum Reprod* 2001;**16**:1306–7.
- [12] Thomas AJ. Vasoepididymostomy. *Atlas Urol Clin North Am* 1999;**7**:65–90.
- [13] Srivastava A, Raghavendran M, Jain M, Gupta S, Chaudhary H. Fine-needle aspiration cytology of the testis: Can it be a single diagnostic modality in azoospermia? *Urol Int* 2004;**73**:23–7.
- [14] Persson PS, Ahren C, Obrant KO. Aspiration biopsy smears of testis in azoospermia. Cytological versus histological examination. *Scand J Urol Nephrol* 1971;**5**:22–6.