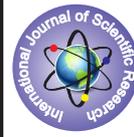


FNAC as a diagnostic modality in male infertility and testicular and scrotal lesions: An experience at a tertiary care hospital.



Pathology

KEYWORDS: FNAC, testis, infertility, adenomatoid tumor

Dr. Akansha Deshwal	Senior Resident, department of pathology, VMMC & safdarjung hospital
Dr. Charanjeet Ahluwalia	Associate Professor, department of pathology, VMMC & safdarjung hospital
Dr. Sachin Kolte	Associate Professor, department of pathology, VMMC & safdarjung hospital
Dr. Mukul Singh	Associate Professor, department of pathology, VMMC & safdarjung hospital

ABSTRACT

FNA of the testis is a minimally traumatic diagnostic method for evaluation of all the testicular lesions.

OBJECTIVE – To study the diagnostic utility of FNA in non-neoplastic and neoplastic lesions of testis and scrotum and to assess the potential of FNA by replacing testicular biopsy in assessment of spermatogenesis in male infertility. **MATERIAL AND METHODS**- In a retrospective study of 2 years and 9 months, a total of 132 cases of testicular and extratesticular FNA were retrieved. **RESULTS**- A total of 132 cases of testicular and extratesticular palpable lesions were included in the study. Out of 132 cases, 96 aspirates were done for assessment of infertility comprising 72.72% of the total cases which was followed by non-inflammatory, inflammatory, neoplastic and unsatisfactory cases constituting 12.12%, 8.33%, 3.78% and 3.03% respectively. **CONCLUSION**- FNA of testis and scrotum is a minimally invasive, rapid and reliable outpatient procedure providing adequate sample from the representative areas without any risk of complication.

INTRODUCTION

The scrotum and testis were earlier believed as a domain of unaided clinical expertise. But, in 1913 Huhner introduced FNAC of testis which was further improvised by Zajiseck in 1979¹. Scrotal masses can either be intratesticular/extratesticular, or solid/cystic. Intratesticular masses need to be dealt with prime concern as majority of these bear a malignant potential as compared to the benign nature of the extratesticular lesions. Ultrasonography, being a primary modality can help only in categorizing lesions into extratesticular and intratesticular, but cannot differentiate benign from the malignant ones². Uniqueness of FNAC is evident by its diagnostic ability to separate benign from malignant and as well as determining the cause of male infertility. FNAC serves as a minimally invasive, rapid and reliable technique by playing a prime role in diagnosis of testicular and scrotal lesions and thereby questions the need of invasive open testicular biopsies.

This paper analyzes the role of FNAC as a diagnostic modality in neoplastic and nonneoplastic testicular lesions and its scope in male infertility.

MATERIAL AND METHODS

From January 2013 to September 2015, a total of 132 cases of FNA of testicular and scrotal lesions were retrieved from the archives of department of pathology of VMMC & Safdarjung hospital, Delhi. In cases of infertility, the patients having azoospermia on atleast 2 occasions underwent FNA by a cytopathologist. The testis was percutaneously punctured with a 24 gauge needle, giving 1-2 passes with gentle back and forth movement of the needle. The material was spread onto the slides, subsequently smears were prepared, air dried and stained with Giemsa and ZN stain (in case of AFB). In case, of cystic lesions therapeutic aspiration was done, followed by centrifugation and preparation of smears from sediment deposits.

RESULTS

Out of 132 cases, 96 aspirates were done for assessment of infertility comprising 72.72% of the total cases which was followed by non-inflammatory, inflammatory, neoplastic and unsatisfactory cases constituting 12.14%, 8.33%, 3.78% and 3.03% respectively.

The age of the patients ranged from 5 to 40 years, with the maximum number of patients (97.7% cases) in the age group 21-40 years. Among, infertility group majority cases showed normal spermatogenesis (44.79%) followed by sertoli cells only (23.95%), maturation arrest (22.92%), hypospermatogenesis (5.22%) and

atrophic pattern (3.12%).

The assessment of spermatogenesis and further categorization was done as follows³ (Table 1)

No.	Type of lesion	No. of cases	%
NON-NEOPLASTIC			
1	Inflammatory	11/132	8.33
	Acute epididymorchitis	1	0.75
	Chronic epididymorchitis	1	0.75
	Granulomatous epididymorchitis	5	3.78
	Spermatic granuloma	3	2.27
	Parasitic	1	0.75
2	Non-inflammatory	16/132	12.12
	Spermatocele	5	3.78
	Hydrocele	3	2.27
	Epididymal cyst/Benign cystic lesion	7	5.30
	Calcinosis cutis	1	0.7
3	Infertility	96/132	72.72
	Normal spermatogenesis	43	32.57
	Sertoli cells only/germ cell aplasia	23	17.42
	Maturation arrest	22	16.66
	Hypospermatogenesis	5	3.78
	Atrophic pattern	3	2.27
NEOPLASTIC			
4a	Primary tumors	2/132	1.51
	- Seminoma	1	0.75
	- Adenomatoid tumor	1	0.75
4b	Metastatic tumors	3/132	2.27
	- ALL	3	2.27
5	UNSATISFACTORY	4/132	3.03

Normal spermatogenesis (43/96): Smears showing abundant cellularity with 10-20 spermatozoa per 40x field (HPF) with abundance of primary spermatocytes and spermatids.

Sertoli cells only/Germ cell aplasia (23/96): Smears show mainly sertoli cells (figure 1).

Maturation arrest (22/96): Early maturation arrest smears showed numerous primary spermatocytes in absence or occasional spermatids or spermatozoa. Late maturation arrest showed normal number of primary spermatocytes and spermatids in absence or

occasional spermatozoa (figure 2).

Hypospermatogenesis (5/96): Smears showing less than 10 spermatozoa/40x field (HPF) with relative decrease in all three germ cell types.

Atrophic pattern (3/96): Smears showed scant sertoli and leydig cells. Among the non-inflammatory category (Table 1), the epididymal cyst/benign cystic lesion (5.30%) was the most commonly encountered followed by spermatocele (3.78%), hydrocele (2.27%) and calcinosis cutis (0.75%)

The inflammatory group (Table 1), showed predominance of granulomatous epididymo-orchitis (3.78%) over spermatic granuloma (2.27%), parasitic (0.75%), acute (0.75%) and chronic epididymo-orchitis (0.75%).

The neoplastic category, was dominated by metastatic tumors (2.27%) rather than primary tumors like seminoma and adenomatoid tumor of epididymis (0.75). A few cases (3.03%) did not yield any diagnostic material on aspiration (Table 1).

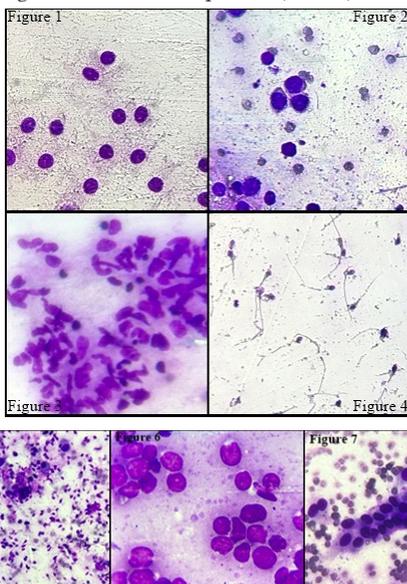


Figure 1: Smear shows sertoli cells (Sertoli cells only syndrome)

Figure 2: Smear shows primary spermatocytes (Maturation arrest)

Figure 3: Smear shows epithelioid cell granuloma (Granulomatous epididymo-orchitis)

Figure 4: Smear shows abundance of mature sperms in a fluid background (Spermatocele)

Figure 5: Smear shows giant cells and macrophages with engulfed sperm heads (Sperm Granuloma).

Figure 6: Smear shows numerous lymphoblasts (testicular infiltration of ALL).

Figure 7: Smear shows clusters of oval to polygonal cells with bland chromatin (Adenomatoid)

DISCUSSION

FNA of scrotum and testis has gained importance as these lesions are detected early by virtue of early onset of pain and ease of palpability¹. FNA is a boon to diagnostic era as this minimally invasive technique produces adequate sample by mere needling of the representative areas obviating the need for more invasive alternatives like surgical biopsy and orchiectomy⁴.

FNAC is a simple, reliable and an outpatient procedure with high sensitivity and specificity. The success tales from the fact that it can authentically differentiate between non-neoplastic and neoplastic lesions resulting in early restitution of the treatment¹.

Azoospermia is one of the common causes of male infertility and

accounts for approximately 10-15% of the cases⁵. Assessment of spermatogenesis is a vital component in diagnosis of infertility. Testicular biopsy is a well established and gold standard method, but FNA has gained wide acceptance as a diagnostic tool as the aspirate is representative of nearly entire testis and conserves tissue of an already failing organ³. Also, the testicular FNA corroborates the ultrasonographic and semen analysis findings in infertility cases and helps differentiating obstructive from non-obstructive azoospermia cases⁶.

Prudent use of testicular FNA can help making hasty decision concerning management strategies in infertile men. In azoospermic patients FNA findings of normal spermatogenesis in the setting normal FSH levels signifies obstructive pathology. Besides its diagnostic approach, FNA have several other implications like retrieving aspirate for intracytoplasmic sperm injection (ICSI) in non-obstructive azoospermia^{7,8,9}. Also, FNA mapping can help locating foci of spermatogenesis in failing testis which is followed by biopsy of that particular site for sperm retrieval¹⁰. It saves unnecessary investigations and emotional turmoil of patients having clinical conditions like sertoli cell syndrome or germ cell aplasia where hormonal therapy is futile.

Epididymis is a common site for non-neoplastic lesions as compared to the neoplastic lesions¹¹. Among inflammatory conditions, our results analysed the predominance of granulomatous/TB epididymo-orchitis cases (figure 3) which is in concordance with previous studies. Tuberculous epididymorchitis is spread by hematogenous route and rarely sexually transmitted¹².

The diagnostic findings include epithelioid cell granulomas with or without multinucleate giant cells and necrosis¹³. However, definitive diagnosis is rendered on visualisation of mycobacteria in smears or culture¹⁴. Although, tuberculosis is endemic in developing nations but a differential of other granulomatous diseases should be considered in AFB negative smears.

Among, non-inflammatory lesions our results show predominance of spermatocele (figure 4) and epidermal cysts over other non-neoplastic lesions. Aspiration in spermatocele plays diagnostic as well as therapeutic role. Smear reveals abundance of sperms on a clear background in absence of inflammation and foreign-body giant cells distinguishing it from sperm granuloma (figure 5) which shows granulomatous inflammation in response to extravasated sperms^{11,15}. Few cyst macrophages may be seen, but inflammation is minimal to absent in spermatocele¹¹.

Our results showed predominance of metastatic tumors in the neoplastic category, shedding light on the incidence of testicular relapse in pediatric leukemias. Testicular infiltration of leukemic cells (figure 6) renders a poor prognosis therefore a mandates a hasty diagnosis for better patient survival¹⁶. In the benign category, one case of adenomatoid tumor (figure 7) of epididymis was found. The FNA smears showed clusters of oval-to-polygonal cells with moderate-to-abundant cytoplasm with round nucleus having bland chromatin. FNAC elucidates preoperative diagnosis of adenomatoid tumors, which can help to plan surgery as complete excision of the benign tumor gives good prognosis without recurrence¹⁷.

Thus FNAC serves as an important tool to screen and diagnose all palpable testicular and extratesticular lesions and provides sufficient information for the initiation of treatment obviating the need for an open biopsy. A keen observation of the cytologic findings goes a long way in sub-classifying most of these lesions.

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