***Original Research Article***

# Histomorphological trends of testicular lesions- A retrospective study

**Comment [BN1]:** 1. Novelty of this article to be explained in a detailed manner comparing with literatures.
2. Spell and formatting to be checked throughout the article.
3. References to be fulfilled as per the journal guidelines.
4.Statistical significance should be shown in the graphical representations.
5. So many literatures are available with this same topic. Journal editor has to decide about this manuscript.


## ABSTRACT

**Aims:** Testis is affected by a variety of non-neoplastic and neoplastic lesions. Our study was undertaken to analyze the spectrum of all testicular lesions and clinical correlation with age-wise distribution, laterality and clinical presentation of all testicular lesions.

**Study design:** Retrospective Descriptive study.

**Place and Duration of Study:** Saveethe Medical College and Hospitals, over a period of three years from January 2018 to December 2020.

**Methodology:** All testicular lesions sent to Department of Pathology during this period are taken for the study. Histopathological slides were retrieved and all testicular lesions were reviewed.

**Results:** Out of 70 cases studied, 64 cases were non-neoplastic (91.42%) and 6 cases were neoplastic (8.57%). Right testis was more commonly involved in our study. Age distribution of non-neoplastic lesions showed highest incidence in 2nd decade of life (18.7%) followed by 6th decade of life (15.6%) in our study. In neoplastic lesions 3rd and 4th decade of life shows higher incidence (33.4% respectively). Among non-neoplastic lesions most common histologic type is atrophic testis (31.2%). Among neoplastic lesions most common lesion is seminoma (50%).

**Conclusion:** Non- neoplastic lesions are seen in all age group whereas testicular neoplastic lesions are more commonly seen in younger age group.



*Keywords:* Testicular lesions, non-neoplastic, neoplastic, atrophic testis, seminoma


## 1. INTRODUCTION

The male reproductive system comprises the testes with their respective duct systems, the prostate and the penis. Their main function is to produce, store and periodic emission of the male gametes, spermatozoa, as well as production of male sex hormones, principally testosterone.

The normal adult testis is a paired organ which lies suspended within the scrotum by the spermatic cord [1,3]. Testis is prone to the full range of pathological conditions. Testicular lesions are seen in all age group ranging from pediatric to adult age group [3,4].

Undescended testes, also known as Cryptorchidism is one of the most common congenital anomalies seen approximately in 1% of one-year old boys [2,3,4]. Cryptorchidism is a major risk factors for development of testicular cancer [3,4].

Other non-neoplastic lesions encompass of inflammatory lesions like acute and chronic Epididymoorchitis, vascular lesions like torsion of testis, regressive changes like atrophic testis and decreased fertility, infections of testis like tuberculosis [2,3].

Neoplastic lesions of testis are rare and accounts for approximately 1% of all neoplasms in male. Testicular tumors can be classified into five major categories: germ cell tumors (90%) which arises from the germinal epithelium of the seminiferous tubules; sex cord–stromal tumors; mixed germ cell–sex cord–stromal tumors; primary tumors not specific to the testis; and metastatic tumors [1].

Scrotal swelling, pain and mass per abdomen are the most common clinical presentations for all testicular lesions [3,4]. Hence histopathologic features play a major role in the clinical prognosis and treatment of testicular lesions [4].

This study was undertaken to study the diverse histomorphological features of both non-neoplastic and neoplastic lesions of testis and clinically corelate with the age wise distribution, laterality of the lesions.

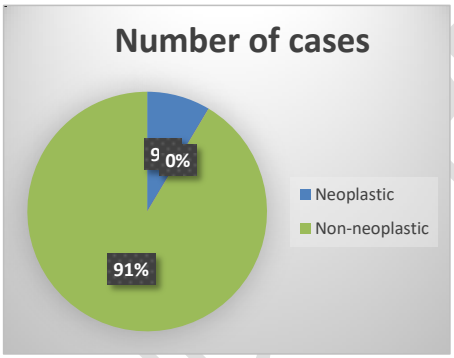
## 2. MATERIAL AND METHODS

This is a retrospective study over a period of three years from January 2018 to December 2020. All testicular lesions sent to Department of Pathology during the study period were taken for the study. Clinical details was obtained from the case sheets. Histopathological slides were retrieved and all testicular lesions were reviewed. The data were analysed descriptively and compared with other studies.

## 3.RESULTS AND DISCUSSION

Among the total cases studied, 64 cases were non-neoplastic (91.42%) and 6 cases were neoplastic (8.57%) as shown in chart 1.

**CHART 1: NUMBER DISTRIBUTION**




Testis is affected by a variety of non-neoplastic and neoplastic lesion at various stages of life. Maximum number of testicular lesions are seen among 11 to 20 years (18.5%) followed by 51 to 60 years (17.1%) as shown in Table 1.

**TABLE 1: AGE WISE DISTRIBUTION**

| AGE | NUMBER OF CASES | PERCENTAGE |
|---|---|---|
| 1 to 10 | 4 | 5.7% |
| **11 to 20** | **13** | **18.5%** |
| 21 to 30 | 11 | 15.7% |
| 31 to 40 | 7 | 10% |
| 41 to 50 | 8 | 11.4% |
| 51 to 60 | 12 | 17.1% |
| 61 to 70 | 9 | 12.8% |
| 71 to 80 | 6 | 8.5% |
| TOTAL: | 70 | 100% |

Majority of the cases present with unilateral involvement of testis. Most of the cases presented with right sided involvement, 41 out of 70 cases (58.5%). Whereas left sided involvement is seen in 26 out of 70 cases (37.1%). Remaining 3 of 70 cases (4.2%) showed bilateral involvement as shown in Table 2.

**TABLE 2: LATERALITY OF SPECIMEN**

| LATERALITY | NUMBER OF CASES | PERCENTAGE |
|---|---|---|
| **RIGHT** | **41** | **58.5%** |
| **LEFT** | 26 | 37.1% |
| **BILATERAL** | 3 | 4.2% |
| **TOTAL** | 70 | |

Age wise distribution of non-neoplastic lesions showed highest incidence in 2nd decade of life, 12 of 64 cases (18.7%) followed by 5th decade of life, 11 of 64 cases (17.1%) as shown in table 3.

Among non-neoplastic lesions most common histologic type is atrophic testis, 20 of 64 cases (31.2%) followed by torsion testis,13 of 64 cases (20.3%). Atrophic testis has wide range of age distribution from 5 to 80 years, more incidence in 2nd decade of life, 5 of 20 cases as shown in table 3. Microscopically atrophic testis showed small tubes with thickened basement membrane with few or no germ cell and increased Leydig cells as shown in figure 1.

Inflammations are more commonly seen in epididymis than in testis. Various etiology leads to inflammation in testis and epididymis out of which Tuberculosis and gonorrhea are the most common etiology [2].

Microscopically the architecture is preserved but there can be patchy lymphoplasmacytic infiltrates in between and with the seminiferous tubules, hemorrhage, edema as shown in Figure 2.

Torsion testis is more commonly seen among 11 to 20 years, 7 of 13 cases. Hydrocele 3 cases were studies (4.6%), usually associated with trauma and epididymitis. Clear serous fluid accumulates between visceral and peritoneal layers of tunica vaginalis. Haemotocele is accumulation of blood in tunica vaginalis, 2 cases were studied. Pyocele, 8 cases studied is collection of pus in the tunica vaginalis.

8 cases of maturation arrest were studied. Maturation arrest can be complete or incomplete. Microscopically mature spermatozoa are absent and Sertoli cells appear prominent due to reduced germ cell.

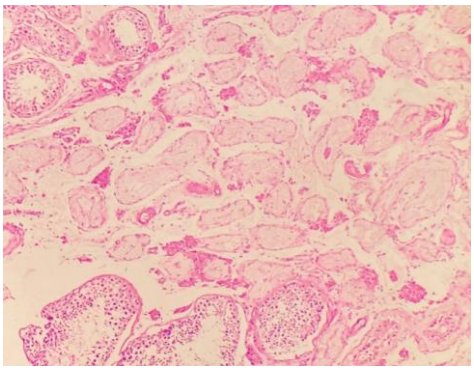


**Figure 1**(H&E 10x) Section shows atrophic tubules with thickened basement membrane and Leydig cell hyperplasia

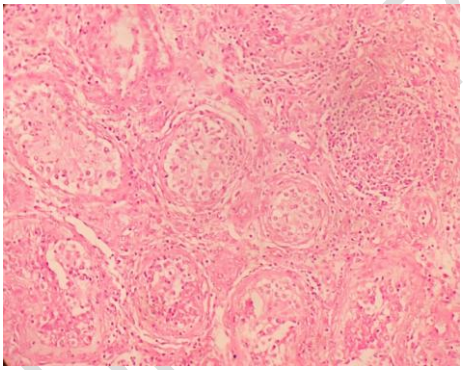


Figure 2 (H&E 10X) Section shows lymphoplasmacytic infiltrates in between and within seminiferous tubules.

**TABLE 3: HISTOPATHOLOGICAL TYPES OF NON-NEOPLASTIC TESTICULAR LESIONS ALONG WITH AGE DISTRIBUTION**

| Spectrum of non-neoplastic: | 0-10 | 11 to 20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | Total | Percentage |
|---|---|---|---|---|---|---|---|---|---|---|
| Epididymoorchitis | | | 2 | 1 | 2 | 3 | 2 | | 10 | 15% |
| Atrophic testis | 2 | 4 | 5 | 2 | 3 | 2 | 2 | 1 | 20 | **31.2%** |
| Torsion testis | 2 | 7 | 1 | 1 | | 2 | | | 13 | 20.3% |
| Hydrocele | | | | | | | 1 | 2 | 3 | 4.6% |
| Haematocele | | | | | | 2 | | | 2 | 3.1% |
| Pyocele | | 1 | | 1 | 1 | | 4 | 1 | 8 | 12.5% |
| maturation arrest | | | 1 | | 1 | 3 | 1 | 2 | 8 | 12.5% |
| Total | 4 | 12 | 9 | 5 | 7 | 11 | 10 | 6 | 64 | 100% |
| Percentage | 6.2% | **18.7%** | 14% | 7.8% | 10.9% | 17.1% | 15.6% | 9.3% | 100% | |

In neoplastic lesions 3rd and 4th decade of life shows higher incidence (33.4% respectively). Among neoplastic lesions most common lesion is seminoma constituting 3 of 6 cases (50%) followed by non-seminomatous mixed germ cell tumor, 2 of 6 cases (33.4%) and seminomatous mixed germ cell tumor, 1 of 6 cases (16.6%) as shown in table 4. Microscopically seminoma shows tumor cells have abundant clear cytoplasm with centrally placed nucleoli as shown in Figure 3.

**TABLE 4: HISTOPATHOLOGICAL TYPES OF NEOPLASTIC TESTICULAR LESIONS ALONG WITH AGE DISTRIBUTION**

| Spectrum of Neoplastic lesions | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | Total | Percentage |
|---|---|---|---|---|---|---|---|---|---|---|
| Seminoma | | 1 | | 2 | | | | | 3 | **50%** |
| Mixed GCT (seminomatous) | | | | | 1 | | | | 1 | 16.6% |
| Mixed GCT (non-seminomatous) | | | 2 | | | | | | 2 | 33.4% |
| Total | | 1 | 2 | 2 | 1 | | | | 6 | 100% |
| Percentage | | 16.6% | **33.4%** | **33.4%** | 16.6% | | | | 100% | |

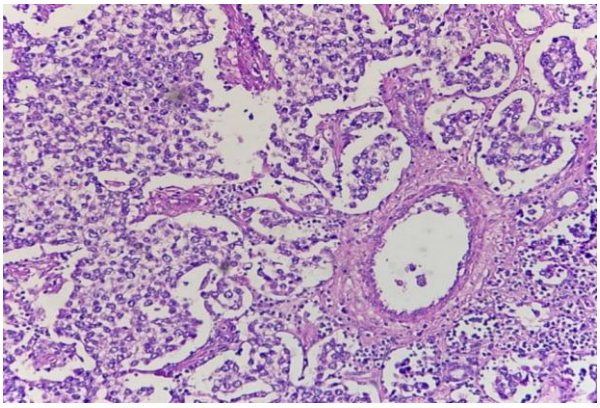


Figure 3 (H&E 20x) Section shows tumour cells with clear cytoplasm with centrally placed nucleus.

**3.1 DISCUSSION**

In this study total of 70 cases were studied. Among these cases 11 to 20 years is the most common age group affected by testicular lesions (18.5%). Similar to the study done by Reddy H Et al (22%) [7]. Right testis is more commonly affected than left side testis in this study (58.5% VS 37.1%) similar to the study done by Tekumalla A Et al (51.25% vs 31.25%) [3].

Non-neoplastic testicular lesions were more common than the neoplastic ones (91.4 vs 8.5%). This is in concordance with Sharma m et al (93 vs 7%) [4].

Age non-neoplastic lesions showed highest incidence in 11 to 20 years (18.7%) in this study which is similar to study done by Qazi sm Et al (30.62%) [9]. Whereas in a study done by Tekumalla A Et all showed highest incidence in 7th decade, corresponding to 32% [3].

Among non-neoplastic lesions most common histologic type is atrophic testis (31.2%).Torsion testis is the most common benign lesion in the study done by Oranusi ck t al corresponding to 42.9% [6] and Baidya r et al (54.9%) [5]. Torsion testis is the second most common non-neoplastic lesion (20.3%) and it is more commonly seen among younger age group of 5 to 55 years in this study.

Neoplastic lesions were more commonly seen among 20 to 40 years (33.4%) in this study. Similar to study done by Mushtaq S Et al which also showed higher incidence among 20 to 39 years of age group (47%) [8].

Among neoplastic lesions most common lesion is seminoma constituting 50% in this study. Also, seminoma is the most common neoplastic lesion of testis in studies done by done by Tekumalla A Et al (40%) [3], Baidya r et al (44.44%) [5] and Gill ms E al (36.5%) [14]. Seminoma is the most common neoplasm of all testicular tumors.

## 4. CONCLUSION

Non- neoplastic lesions are seen in all age group whereas testicular neoplastic lesions are more commonly seen in younger age group.Knowledge about histomorphology and age distribution of neoplastic and non-neoplastic lesions of testis is important as it determines the clinical prognosis and treatment of the patient.

**ETHICAL APPROVAL**

Ethical clearance- Institutional ethics committee approval was obtained.

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