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# Histopathological Spectrum of Testicular Lesions in A Tertiary Care Hospital - A Three-Year Retrospective Study

[1]Dr. Sunjam Kour Khajuria, Postgraduate, Department of Pathology, Acharya Shri Chander College of Medical Sciences Sidhra, Jammu.

[2]Dr. Aneeta Singh, Professor, Department of Pathology, Acharya Shri Chander College of Medical Science Sidhra, Jammu.

[3]Dr. Arvind Khajuria, Head of Department Pathology Acharya Shri Chander College of Medical Science Sidhra, Jammu.

**Corresponding Author:** Dr. Sunjam kour Khajuria, Postgraduate, Department of Pathology, Acharya Shri Chander College of Medical Sciences Sidhra, Jammu.

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## Abstract

**Introduction**: Testicular tumors are relatively rare and comprise 1% of all male cancers worldwide with peak prevalence in the age group 15-35 years. Testicular tumor his to pathologically categorized as non-neo plastic and neoplastic. Non-neoplastic causes include undescended testis, testicular atrophy, and trauma. The testicular tumors are histologically diverse.

**Aims and objective**: To study the his to morphological spectrum of testicular lesions including non-neoplastic and neoplastic and to determine age-wise distribution, laterality and clinical presentation in testicular lesions.

**Material and method**s: This study was done in department of pathology of Acharya Shri Chander College of Medical Sciences and Research, a tertiary care hospital. A total of 50 orchidectomy specimens and biopsies were studied. Histopathological examination was done after routine processing and staining with H&E.

**Results**: 40 orchidectomy specimens and 10 biopsies were studied. Out of the total 35 were non-neoplastic and 15 were neoplastic. Testicular atrophy was common non-neoplastic condition (14/ 35) 40%, followed by undescended testis (8/ 35) 22.8% followed by testicular torsion (5/ 35) 14.2% and others. In neoplastic lesions, seminoma was most common (46.7%) followed by yolk sac tumor (20 %) and NHL (20%) and mixed germ cell tumor (13. 3 %). Testicular swelling was main chief com plaint and right side was involved more commonly 29/ 50 (58 %).

**Conclusion**: Despite new techniques in imaging and tumor marker assay the diagnosis of testicular lesions is

primarily dependent upon his to pathological examination.

**Keywords:** Mixed germ cell tumor, Seminoma, Testicular tumor, Yolk sac tumor, Mixed germ cell tumor.

**Introduction**

Testicular tumors are rare comprises 1% of all male cancers worldwide[1] with peak prevalence in the age group 15-35 years[2]. These tumors are rare in majority parts of the world with incidence rate of 1per 100,000 in Asians and Africans. As incidence of testicular tumor is high among young adults of reproductive age, it is believed that high estrogen levels in-utero may contribute to development of testicular cancers[3]. A reverse trend has been seen with the testicular cancers where the incidence decreases with increasing age[4].The etiology of testicular tumors is not well understood, various risk factors for development of testicular cancers include: a family history of testicular tumor in first degree relatives, infertility, cryptorchidism, klinefelter's syndrome and some other uncommon factors like trauma, hormones, etc[5]. Testis is affected by both non-neo plastic and neoplastic condition. Non – neo plastic conditions include testicular atrophy, torsion, cryptorchid testis, infections of testis like tuberculosis, infertility, malakoplakia and vasculitis[6]. Although testicular cancer can be derived from any cell type found in the testicles, more than 95% of testicular cancers arise from germ cells[7]. Significant advances in the understanding of diseases, various investigate modalities per say, routine tests, x-ray, ultrasound, CT scan, intra venous urography, tumor marker assay and finally his to pathological examination is of useful guide.

**Aims and objectives**

1. To study the incidence and various histopathological patterns of testicular tumor
2. To determine the relative incidence of various testicular lesions among different age groups
3. To find out incidence of neoplastic testicular lesions and to study their different his to morpho logical patterns.

**Material and methods**

This was a retrospective study carried out in the department of Pathology of Acharya Shri Chander College of Medical Sciences and Research, over the duration of 3 years. A total 50 orchidectomy specimens and biopsies were studied. Clinical details like age, laterality, family history, history of risk factors and serum markers of patient were recorded. All patients were investigated with routine hemogram, x-ray, ultrasound abdomen, when required serum marker assay of Alpha-fetoprotein, human chorionic gonadotrophin and CT scan were done.

Thorough gross examination was carried out and noted findings like right or left side, external surface, condition of tunica albuginea, consistency, size of tumor, appearance of cut surface, color, necrosis or hemorrhage, condition of surrounding testicular tissue, epididymis and spermatic cord and surgical margin. Lymph nodes were also screened for metastasis. Grossly multiple sections of 3-4 mm thickness varying from 2 to 10 sections from tumor, part of normal testicular tissue, epididymis, spermatic cord was taken.

The gross specimens were fixed in 10% neutral buffered formalin for overnight fixation, after processing sections are embedded in paraffin to make paraffin blocks. These blocks cut in 3–5-micron thickness using microtome. Slides are stained using H&E stain and then mounted

with DPX. These microscopic findings were then correlated with clinical diagnosis.

**Results**

The present study comprised of total 50 cases. 40 orchidectomy specimens and 10 were testicular biopsies were studied. Out of these 35 were non- neoplastic and 15 were neoplastic lesions. Among non – neo plastic lesions, youngest patient was 9 years old and oldest patient was 69 years old. Among neoplastic lesions, youngest patient was 9 years old and oldest was 73 years old. His to logically, among non- neoplastic lesions testicular atrophy was most common, followed by undescended testis and testicular torsion. An inflammatory lesion includes tubercular orchitis and abscess. Most of the non-neoplastic lesions were found in the 3rd decade of life (10/35).

Among neoplastic lesions (15/50), 12(80%) cases were germ cell tumor and 3(20%) cases were NHL. Among the germ cell tumor 7(46.6%) cases were seminoma (7/12). In non-seminoma Tous germ cell tumor (5/12) , 3 (20%) cases were yolk sac tumor and 2(13.4%) cases were mixed germ cell tumor. Most neoplastic testicular tumor were seen in 4th decade of life (4/15) and (3/15) in 5th decade. Clinically testicular lesions presented with varied symptoms, like testicular swelling, lower abdominal lump, pain, fever. Right testis was involved more commonly (29/50) 58% than left testis (21/50) 42%, there was no bilateral involvement in our study. Tumors markers study is important for clinical significance, diagnosis and management of germ cell tumor. Out of 7 patients of seminoma, HCG was raised in 4 patients and out of 3 cases of yolk sac tumor, alpha-fetoprotein was elevated in 2 cases.

Table 1: Showing age- wise differential diagnosis made in the non-neoplastic testicular specimens

| | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Testicular atrophy | 0 | 2 | 5 | 4 | 1 | 1 | 1 | 0 | 14(40%) |
| Undescended testis | 2 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 8(22.8%) |
| Testicular abscess | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 4(11.4%) |
| Testicular torsion | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 5(14.3%) |
| Tubercular orchitis | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1(2.8%) |
| Normal testicular tissue | 0 | 1 | 1 | 1 | 0 | | 0 | 0 | 3(8.7%) |
| Total | 2 | 8 | 10 | 9 | 4 | 1 | 1 | | 35(100%) |

Table 2: Showing age- wise distribution of various neoplastic testicular lesions

| | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Seminoma | 0 | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 7(46.6%) |
| Yolk sac tumor | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3(20%) |
| NHL | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3(20%) |
| MGCT | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2(13.4%) |
| Total | 2 | 0 | 2 | 4 | 3 | 1 | 1 | 2 | 15(100%) |

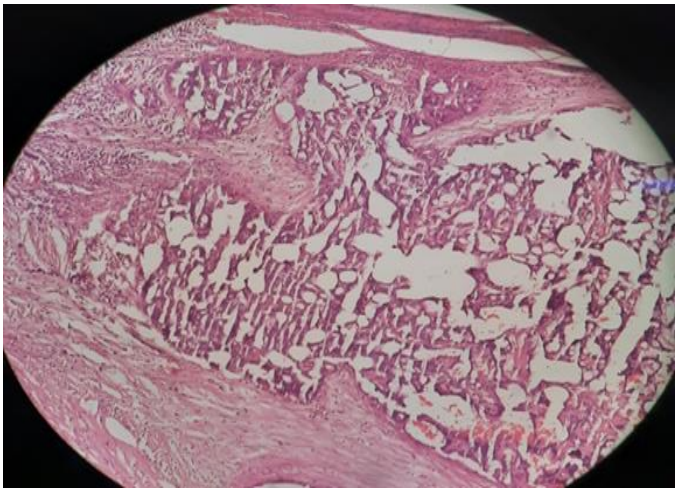

Figure 1: Yolk sac tumor of testis (H&E, 40X)

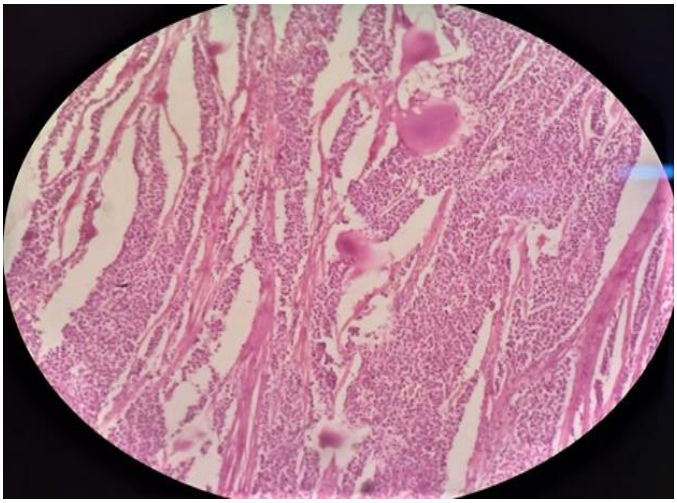

Figure 2: Micro picture of seminoma showing uni form tumor cells arranged in sheets (H&E,40X)

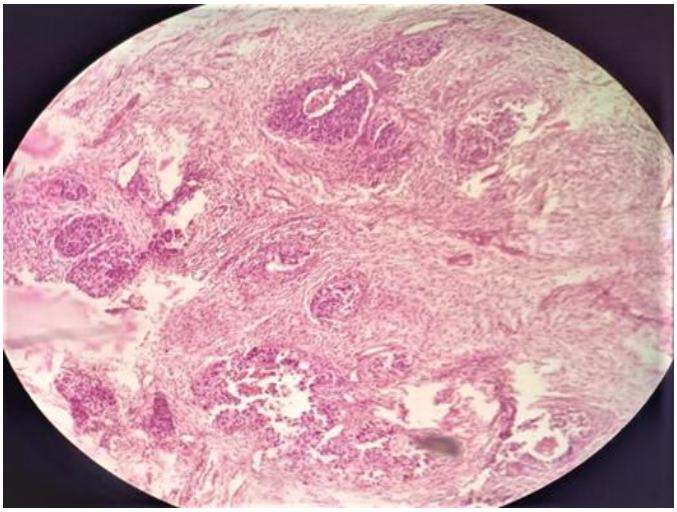

Figure 3: Mixed germ cell tumor showing embryonal carcinoma and seminoma (H&E 40X)

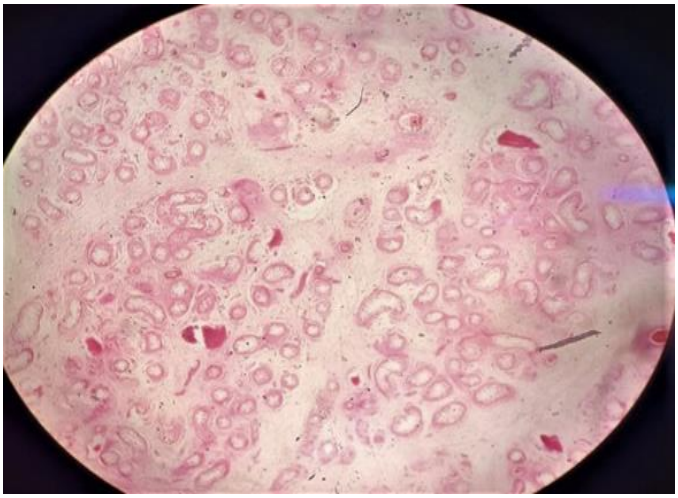

Figure 4: Showing small tubules with absence of any germ cells in atrophic testis.

**Discussion**

Incidence of testicular tumor is low, still it is one of the most common malignancies occurring in young adults. Testicular tumor represents 10.5% of all male reproductive cancers in India[8.] In the present study, 70% of lesions were benign and 30% lesions turned out to b malignant. This is in concordance to the study done by Deore KS[18] where 92% testicular lesions were benign and 8% were malignant. However, Mahesh BP et al[10] revealed variable results compared to the present study with 80% cases being malignant and 20% being benign lesions.

Testicular swelling was the chief complaint in >90% patients in the present study. This was in concordance with studies done by Reddy H et al[9], Patel MB [10] and Sharma et al[11]. Right side testis more commonly involved than left testis, similar findings were reported by Patel MB[10] and Sharma et al[11].

Among non-neoplastic lesions testicular atrophy was the most common lesions, followed by undescended testis, testicular torsion etc, however these findings are not comparable with studies done by Sharma S[12], where cryptorchidism was the most common non-neoplastic

lesion. Undescended testis comprises of 8/35 (22.8%) of the total non-neoplastic lesions, however none of them showed malignancy.

Incidence of neoplastic lesions was 30% in the present study. Most of the neoplastic lesions were seen in the 3rd and 4th decade of life. Mostofi and Price[13] described that germ cell tumor constitute more than 94% of the testicular tumor. In the present study germ cell tumor formed the main bulk, representing 80% o all the testicular tumor. Seminoma was the most common histological type seen in the present study 46.6% (7) with mean age of 37.6 years. This is comparable to study done by Reddy et al[9] where mean age was 40 years. In the present study seminoma was most commonly seen in 4th decade. Among non-seminoma Tous tumor, yolk sac tumor was more common than mixed germ cell tumor, similar results were seen in study from Nigeria[14]where yolk sac tumor was the most common subtype whereas in the study by Deora KS[18], mixed germ cell tumor was most common subtype followed by yolk sac tumor.

Among non-seminoma Tous germ cell tumors, 3 cases of yolk sac tumor and 2 cases of mixed germ cell tumor were reported in the present study. Embryonal cell carcinoma and teratoma were more frequently encountered in combination of mixed germ cell tumor constituting majority of testicular tumor. In the present study we reported 2 cases of mixed germ cell tumor one having a mixture of embryonal ca + yolk sac tumor+ seminoma and other one having a mixture of embryonal ca+ teratoma. In the present study, the yolk sac tumor was seen in youngest patient who is 9 years old as well as also seen in 60 years old patient. Non-Hodgkin was reported in 3 cases and mean age was 73 years. Fonseca et al[17] reported median age of presentation of NHL to be 68 years. In the present study other than germ cell tumor, lymphomas were the next common tumor constituting about 20% cases these findings are in comparison with chakrabarti et al[15]. Sanjay Met al[16] reported 11.11% cases of lymphomas and Deore KS et al[18] reported 2 (11.7%) cases of NHL and in their study, whereas Reddy H et al[9] did not reported any case of lymphoma in their study.

**Conclusion**

We concluded that non-neoplastic lesions of testis are common than neoplastic lesions. Germ cell tumor accounted for highest percentage of the cases with a commonest subtype Seminoma. Patient diagnosed with testicular tumor were mostly in 3rd and 4th decade. Right side laterality was prevalent. Testicular swelling was the main chief complaint. The incidence of testicular tumor remains low in India which is reflected by the scarcity of studies in published literature. His to patho logical examination can help in accurately diagnosing and determining the prognosis of these rare tumors and tumor like lesions of testis.

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