
ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE DEPARTMENT OF PATHOLOGY

**Title: pathological patterns of testicular and paratesticular lesions from January 2019 to December 2023 G.C in Tikur-Anbessa Specialized Hospital.**

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A research thesis submitted to the Post-Graduatespeciality Program of Addis Ababa University, Department of pathology, and School of Health Sciences for Partial Fulfillment for the Post-graduate diploma in pathology.

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## DECLARATION

I, Dr. Abdi mohammed Beker with the registration number of **GSR/1094/13**; do hereby declare that this thesis entitled '***pathological patterns of testicular and paratesticular lesions,****a retrospective descriptive study from January 2019 to December 2023 G.C in Tikur-Anbessa Specialized Hospital, Addis Ababa, Ethiopia'* is my original work and that it has not been submitted partially; or in full, by any other person for an award of degree in any other university/institution.

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***This thesis has been submitted for examination with my approval.***

***Name of advisor: Dr. Fadil nuredin ; Sig: _____Date:_____***

## APPROVAL

The undersigned certify that they have read and hereby recommended to Addis Ababa University to accept the thesis submitted by ***Dr. Abdi mohammed Beker*** entitled '***pathological patterns of testicular and paratesticular lesions,a retrospective descriptive study from January 2019 to December 2023 G.C*** in Tikur-Anbessa Specialized Hospital, Addis Ababa, Ethiopia' for partial fulfillment of the requirements for the award of certificate in pathology.

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ACRONYMS AND ABBREVIATIONS

GCNIS…….. Germ Cell Neoplasia insitu

TC……. Testicular cancer

WHO……. World Health Organization

WSP…….. World standard Population

# Contents

ABSTRACT

Background: Testis is affected by both non neoplastic and neoplastic conditions. There are various testicular lesions, ranging from paediatric to adult age groups. A critical gap exists in our national medical literature regarding the incidence of testicular lesions, both benign and malignant. To address this, we propose a study investigating orchidectomy specimens collected within our hospital for various clinical indications..

Objective: This study aims to characterize the spectrum of testicular and Para testicular lesions observed in orchidectomy specimens. The study analyzes the demographic data of patients alongside the clinical and microscopic features of these lesions. Additionally, the study investigates the prevalence of testicular neoplasms in Ethiopiacompared to other countries.

Material and Method: The study was retrospective study, conducted at Tikuranbesa specialized hospitalin the department of PATHOLOGY with study period of 5 years (September 2019 up to august 2023). The study design was retrospective descriptive cross sectional study.

RESULT: There were a total of 78 testicular biopsies recorded in the study period. most of them 58(74%) were non neoplastic lesions, and out of these 20 cases(34.5%) were undescended testis followed by 11cases(19%) of tuberculous orchitis and 10 (17%) cases were testicular atrophy for different reasons. Neoplastic conditions accounted for 20 cases(26%) of the total from this 5(25%) were classical seminoma, ,3(15%) mixed germ cell tumor, 1 case(5%) of sex cord stromal tumor and 1case(5%) of infiltrates of lymphoblastic lymphoma were identified. the minimum and maximum age for the non neoplastic lesion was 1 and 72 years respectively, mean age was 30.8 year. For the neoplastic lesions the minimum age was 1 year and maximum was 67 and the mean age was 34 year. Testicular swelling was the main clinical presentation for neoplastic lesion. most patient present at PT2 stage. on average there was a total of 4 neoplastic lesions per year. Right testis was most commonly affected with non-neoplastic and neoplastic lesions.4 cases of Para testicular lesion were identified, spindle cell rhabdomyosarcoma, mucinous cyst adenoma, fibrous pseudotumor and low grade fibromyxosarcoma.

Conclusion: Non-neoplastic lesions constituted the largest category within the testicular specimens examined. Cryptorchidism emerged as the most prevalent histomorphological diagnosis, followed by tuberculous orchitis. Neoplastic lesions, conversely, were less frequent. Among these, germ cell tumors represented the most common malignancy, with classical seminoma being the predominant histomorphologicalpattern..

Keywords: Cryptorchidism, tuberculous orchitis, germ cell tumors, seminoma

## 1.Introduction

### 1.1 Background

Testis is affected by both non neoplastic and neoplastic conditions. There are various testicular lesions, ranging from paediatric to adult age groups. They usually present with scrotal swelling, pain and mass per abdomen.Histomorphologic patterns of testicular lesions refer to the microscopic features of testicular tissue that are indicative of various pathological conditions which can be broadly classified into non-neoplastic and neoplastic lesions . Non-neoplastic lesions include inflammatory and degenerative conditions, while neoplastic lesions include germ cell tumors, sex cord-stromal tumors, and metastatic tumors . The histomorphological patterns of testicular lesions can vary depending on the type of lesion and the stage of the disease

Some of the non neoplastic conditions that occur in the setting of testes include degenerative lesions such as cryptorchidism, absence of one or both testes and fusion of the testes (synorchism). From the regressive changes atrophy and decreased fertility may be caused by one of several conditions, including progressive atherosclerotic narrowing of blood supply in old age, the end stage of an inflammatory orchitis, cryptorchidism, hypopituitarism, generalized malnutrition or cachexia, irradiation, prolonged administration of antiandrogens and exhaustion atrophy, atrophy occasionally occurs as primary failure of genetic origin, such as in klinefelter syndrome. The testes are also affected by inflammatory conditions like nonspecific orchitis commonly related to infections in the urinary tract (cystitis, urethritis, prostatitis). In sexually active men C. trachomatis and Neisseria gonorrhea are most frequent. We also have granulomatous orchitis tuberculosis, atypical mycobacteriosis, leprosy, sarcoidosis, syphilis and crohn disease. The testis also can be involved by viral orchitis, malakoplakia, juvenile xantogranuloma, rosai-dorfman and xantogranulomatous orchitis.

The testis also can be affected by torsion, twisting of the spermatic cord typically cuts off the venous drainage of the testis which frequently leads to testicular infarction which represent one of the few urologic emergencies.

Testicular tumors are a diverse group of neoplastic conditions that arise from the testes, the male reproductive organs responsible for producing sperm and hormones. Testicular cancers comprise 1% of all the male cancers worldwide(1).These tumors can occur at any age, but they are most commonly diagnosed in young and middle-aged men. The incidence of testicular germ cell tumors shows a remarkable geographical variation. The highest level of incidence, around 8-19 per 100,000 world standard population (WSP) are found in Denmark, Germany, Norway, Hungary and Switzerland. The only population of Non-European origin with a similar high level of incidence is the Maori population of New Zealand with 7 per 100,000 WSP. In populations in Africa, the Caribbean and Asia the level of incidence is typically less than 2 per 100,000 WSP.(1)

There are several known risk factors for testicular cancer, including age (most common in men between the ages of 20 and 39 and is more likely to occur in men with a family history of the disease or who were born with cryptorchidism (undescended testicles). White men and those suffering from HIV infections are more vulnerable to TC as compared to their counterparts from other racial groups. Men who have had testicular cancer in one testicle are also at increased risk of developing cancer in the other testicle.TC may occur in men who do not have any known risk factors.(2)

Most testicular germ cell tumors present with progressive, painless enlargement of the testis. A small tumor may be found in a testis by palpation or ultrasonography. They may grow slowly or with appalling speed. Sometimes, the initial presentation is in the form of a metastatic deposit in the retroperitoneum, lung, or mediastinum. Presentation with significant clinical symptomatology is uncommon in seminoma, but relatively common for choriocarcinoma, in which the patient may have gynecomastia; large mediastinal, pulmonary, liver and/or brain metastases; and markedly increased levels of serum human chorionic gonadotropin (hCG).(3)

The vast majority of testicular tumors originate from germ cells, which are the precursors to sperm cells. According to World health organization(WHO) testicular tumors could be germ cell tumors which could be derived from germ cell neoplasia in situ or unrelated to germ cell neoplasia in situ (GCNIS),sex cord–stromal tumors; mixed germ cell–sex cord–stromal tumors; primary tumors not specific to the testis; and metastatic tumors(4). Seminoma which could be both germ cell neoplasia in situ derived or unrelated to germ cell neoplasia in situ (GCNIS) is a type of TC that tends to grow and spread more slowly than non-seminoma. It has a survival rate of 98–99% when the diagnosis is made in nascent phases.(5)

The more aggressive non-seminoma tends to grow and spread more quickly than seminoma.There are several subtypes of non-seminoma, including teratoma, embryonal carcinoma, yolk sac tumor, and choriocarcinoma. These subtypes can behave differently and may require different treatments.(6)

Sex cord-stromal tumors are another group of testicular neoplasms that arise from the supportive and hormone-producing tissues of the testes. They are less common than germ cell tumors but require specific histomorphological features for accurate classification. Leydig cell tumors, which produce androgens, and Sertoli cell tumors, which support sperm cell development, are the two main subtypes of sex cord-stromal tumors.(7)

In addition to germ cell and sex cord-stromal tumors, testicular tumors may include rare miscellaneous tumors such as gonadoblastomas, lymphomas, and metastatic tumors from other primary sites. Histomorphological analysis is crucial for differentiating these rare entities from more common testicular tumors and aiding in appropriate treatment decisions.(8)

In conclusion, histomorphological patterns of testicular lesion offer valuable insights into their classification, prognosis, and treatment. The detailed examination of lesion tissue under the microscope remains an indispensable tool for pathologists and oncologists, as it contributes to the overall management and care of patients affected by testicular tumors. Ongoing research and understanding of these histomorphological patterns continue to shape the field of urological pathology and drive advancements in personalized medicine for testicular lesion patients.

Primary paratesticular tumors are uncommon neoplastic entities that typically originate from the tissues adjacent to the testes. These include tumors of the collecting duct,rete testis ,epididymis, and mesothelial tumors(12).

**1.2 Statement of the problem**

Testicular and paratesticular lesions, both benign and malignant, pose significant challenges in the field of urology and pathology due to their diverse patterns. The accurate diagnosis

and classification of these lesions are crucial for determining the appropriate therapeutic approach and predicting patient prognosis.

These study contribute to the understanding of the various patterns of these lesions, shedding light on the prevalence of these lesions and providing valuable information for clinical diagnosis and management.

**1.3 Rationale of the study**

There are very few study paper done on testicular and paratesticular lesion in our country (Ethiopia) so These study would help in:

Identification of different types of testicular lesions

Improved diagnosis and treatment: Understanding the pathological patterns of testicular lesions can help in the diagnosis and treatment of the disease

Epidemiological characteristics: The study can provide information on the epidemiological characteristics of testicular lesions , such as age range and incidence rates

Research and Advancements: the study of testicular lesions contribute to the overall body of knowledge in oncology and pathology.

## 2. LITERATURE REVIEW

The first literature is from Kenya, (12)Retrospective case study of testicular cancer patients over a fifteen year period at Kenyatta National Hospital, a referral and teaching hospital. The mean age was 34.8 years with a peak incidence in the 30-44 year age group. History of cryptorchidism was obtained in 10.26% of the patients. Thirty one patients (79.49%) presented with painless testicular swellings, eleven (28.08%) with pain, nine (23.08%) with scrotal heaviness, six (15.38%) with abdominal swellings and one (2.56%) each with gynecomastia and eye swelling. On examination 32 patients (82.05%) had testicular masses, ten (25.64%) had abdominal masses, seven (17.91%) had supraclavicular and cervical lymphadenopathy, and one each (2.56%) had gynecomastia and eye mass respectively(9). More than eighty nine per cent had germ cell cancers with seminoma accounting for 67.35%, teratoma 12.24%, embroyonal carcinoma 8.16%, rhabdomyosarcoma 6.12% and malignant germ cell tumor, orchioblastoma and dysgerminoma each accounted for 2.04%(9).

Similarly in study from neighboring African country of done in Nigeria, Three hundred and forty- three testicular specimens were subjected to histology during the 14- year study period.

nonneoplastic specimens added up to 331 cases (96.5%), with age range of 3–90 years and the highest incident in the fourth and fifth decades. Atrophies and maturation arrests were the most common benign lesions and formed 29.4% and 18.0%, respectively. Neoplastic lesions accounted for only 12 cases (3.5%) of these specimens with the age range of 3–65 years. The tumors were more common on the right than the left side with a ratio of 1.4 (10). the Study also show 12 cases were neoplastic cases and Seminomas were the most common histologic type among the neoplastic lesions with eight cases (66.7%). Yolk sac tumor, embryonal carcinoma, Leydig cell tumor, mixed germ cell, and stromal tumor each had a single specimen.(10)

Another similar study from Tanzania,(11)Ten-year experience with testicular cancer at a tertiary care hospital. A total of 56 testicular cancer patients were enrolled in the study, representing 0.9% of all malignancies. The median age of patients at presentation was 28 years, with a peak incidence in the 21-to-30-year age group. A family history of testicular cancer was reported in four (5.4%) patients. A history of cryptorchidism was reported in six (10.7%) patients. Most patients (57.1%) presented late with an advanced stage of cancer. Testicular swelling was the main complaint in 48 (85.7%) patients. The right testis was involved in 67.9% of cases. Lymph node and distant metastases were documented in 10 (17.9%) and 12 (21.4%) patients, respectively. Histologically, 80.4% of patients had germ cell cancers, with seminoma accounting for 62.2% of cases.

According to retrospective study done in Indian by Sharma M, Mahajan V, Suri J, Kaul KK . The study comprised a total of 57 cases. Non- neoplastic testicular lesions were more common than the neoplastic ones (93 vs. 7%). Non- neoplastic lesions were most common in 2nd decade of life with a wide age range of 5 months- 80 years. Among non-neoplastic lesions (n=53),

undescended testis (39.62%) was the most common non-neoplastic lesion followed by inflammatory lesions (24.53%), infarcted testis (torsion, 18.86%) and atrophic testis (16.98%). Inflammatory lesions included

nonspecific epididymo-orchitis (15.1%), testicular abscess (5.66%) and tubercular epididymo-orchitis (3.77%). Only 4 cases (7%) of testicular neoplasm were diagnosed in the study period amounting to only 1.33 case/ year. All 4 cases were germ cell neoplasms with age range of 14 months- 35 years and mean age 20.54 years. One case each of seminoma, yolk sac tumour,

immature teratoma and mixed germ cell tumour (mixed teratoma and seminoma) was diagnosed.(12)

Based on research done in tertiary care in central india , there were 37 histopathologically confirmed cases of testicular and paratesticular neoplasms over a study period of ten years. The mean age was 38.1 years with the age range of 1 to 80 years. More than 59% of cases occurred in 3$^{rd}$ and 4th decade. Twenty six (70.3%) of the tumours were on the right side and 11 (29.7%) were on left side. There was no bilateral involvement in our study.(13)

Scrotal swelling and heaviness was recorded in 29 cases and history of pain in 7 cases. A history of cryptorchidism was noted in 3 cases and family history of testicular neoplasm in 2 cases. Testicular atrophy was noted in 1 case. Preoperative assay of tumor marker showed elevated α-fetoprotein and β-human chorionic gonadotrophin levels in 10 (27.0%) and 6 cases (16.2%) respectively.(13)

Study in Pakistan During the period 1991-98, 170 cases of testicular cancer were diagnosed. Age of the patients ranged from 01 year to 84 years with a mean age of 30.94 years. The most common mode of presentation was testicular mass or swelling (94.4%), whereas cryptorchidism was seen in 8.4% cases, gynecomastia in 1 .4% cases and history of testicular trauma was observed in 1.4% of the cases. Laterality of testicular involvement was known in 127 cases. Sixty six cases (51 .9%) were detected in the right testis and 59 cases (46.5%) in the left testis. Both testes were involved in two patients only.(14)out of total 170 cases histologically 83.5% were of germ cell type, the rest 16.5% cases were various non-germ cell tumors. Amongst the germ cell tumors, seminoma (43.66%) was the most common type.

3. Objectives

### 3.1. General objective

- ❖ This study was undertaken to describe the pathological patterns of orchidectomy specimens in pathology department.

### 3.2 Specific objectives

- To classify and categorize orchidectomy specimens as non neoplastic and neoplastic lesions.
- To describe the histomorphological types of non neoplastic testicular lesions.
- To describe the histomorphological types and subtypes of testicular and paratesticulartumors
- This study also aims to investigate epidemiological characteristics and clinical presentation of both neoplastic and non neoplastic lesions.
- To assess the pathological staging of neoplastic testicular lesions.

4. METHODS

**4.1. Study Area**

The study will be conducted at Tikur-Anbessa Specialized Hospital, Addis Ababa, Ethiopia which is the largest referral hospital for Ethiopia as a whole receiving many patients, especially, patients diagnosed with testicular tumor. It is one of the leading referral hospitals to accept, diagnose and treat testicular tumor patients.

**4.2. Study Design**

A quantitative retrospective descriptive statistic study will be utilized to analyze the data collected from the medical records of patients diagnosed with testicular tumor inTikur-Anbessa Specialized Hospital between January 2019 up to December of 2023.

**4.3. Source and Study Population**

The source of the study are all patients with testicular and paratesticular lesion presenting to the Tikur-AnbessaSpecialized Hospital between January 2019 up to December 2023 and

The study population ,all patient who had had histopathologically confirmed testicular and paratesticular lesion biopsies at black lion hospital between January 2019 up to December 2023.

**4.4. Eligibility Criteria**

***4.4.1. Inclusion Criteria***

- Samples obtained through biopsies or surgical resections
- patients record within a specified time frame and at a specific location

*4.4.2. Exclusion Criteria*

- Diagnosis signed out with descriptive diagnosis and comments
- Incomplete or unavailable histopathological examination results
- Cases which are recurrent

4.5. Sample Size Determination

- The medical records of patients with testicular tumor registered in the hospitals pathology department from January 2019 up to December of 2023 will be examined. After checking and clearing for duplications in the registral number of the patients, all the remaining cases will be evaluated.

*4.6. Sampling Procedure*

- All patients with testicular tumor cases between January 2019 up to December of 2023

  will be utilized for the research activities.

4.7. Data Collection

- The total number of patients with testicular tumors will be collected from pathology department of the hospital. The time-frame of January 2019 up to December of 2023

will be used for the research. The time frame of 5 years was used due to the time-frame of the research study.

- Demographic variables such as age
- Demographic variables related to tumor characteristics including tumor laterality (unilateral or bilateral), histological subtype and stage will be collected from patients biopsy report.

4.8. Variables

4.8.1. Dependent Variables

- Histopathological Patterns of testicular and paratesticular lesion

4.8.2. Independent Variables

1. Age:
2. Clinical presentation (sign and symptoms)
3. Tumor characteristics: such as
   - ✓ laterality (unilateral or bilateral) and
   - ✓ stage

4.10 Data Management

- ✓ The information gathered from the study will be entered into an excel spreadsheet and uploaded to SPSS 26 for analysis. Missing values, outliers, and other inconsistencies will be removed from data, which will be gathered, categorized, and entered into Epi info version 7.2. The data will be cleaned up using frequency, sort, and list. The cleaned data will be exported to SPSS version 26 for analysis, and using the Epi Info statistical software the data will be interpreted in the format of frequencies and percentages.

4.11 Data Quality Assurance

To ensure data quality, a standardized questionnaire adapted from previous studies will be employed. The questionnaires will be written in English language only. The study's overall activities will be carefully observed and followed. To improve recollection, information accuracy and result consistency, patients' data will be taken from pathology department of Tikur-Anbessa Specialized Hospital data base.

4.12 Ethical Consideration

Ethical clearance and official letterwas taken from Addis Ababa University, College of Health

Sciences, and School of Medicine. Pathology department received an official letter and

permission was sought from the above-mentioned areas in order to undertake the research. Confidentiality was maintained by keeping information anonymous and ensuring that it was not available to anybody other than researcher.

4.13 Dissemination of the Results

Addis Ababa University, School of Medicine and the Department of pathology will receive my results of the research study. In addition, the research findings will be presented in a seminar presentation and if possible, published in a peer-reviewed journal. Publication will also be used to communicate the findings.

## 5.RESULTS

A total of 96 cases were collected for analysis and interpretation, but 18 cases didn't met the inclusion criteria, due to incompletely filled and signed out as descriptive.Those 78 cases which met the criteria are finally ready for data analysis and the results are depicted as follow.

In the last five year the youngest age to undergo orchidectomy was a 1 year old boy while the oldest was 72 years old making the mean age 32.06 years.

Table 5.1 Distribution frequency of age of patients (non neoplastic and neoplastic)

| | N | Minimum | Maximum | Mean | median | skewness | Std. Error of Skewness |
|---|---|---|---|---|---|---|---|
| Age | 78 | 1 | 72 | 32.06 | 32.00 | 0.127 | 0.272 |

The data presented in the above table suggests a symmetrical distribution of patient ages.

Table 5.2 year of specimen received

| Year | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 2019 | 10 | 12.8 | 12.8 | 14.1 |
| 2020 | 11 | 14.1 | 14.1 | 16.6 |
| 2021 | 32 | 41 | 41 | 44.8 |
| 2022 | 12 | 15.3 | 15.3 | 24.5 |
| 2023 | 13 | 16.6 | 16.6 | 100 |
| Total | 78 | 100.0 | 100.0 | |

Year 2021 is the year most biopsy was received.

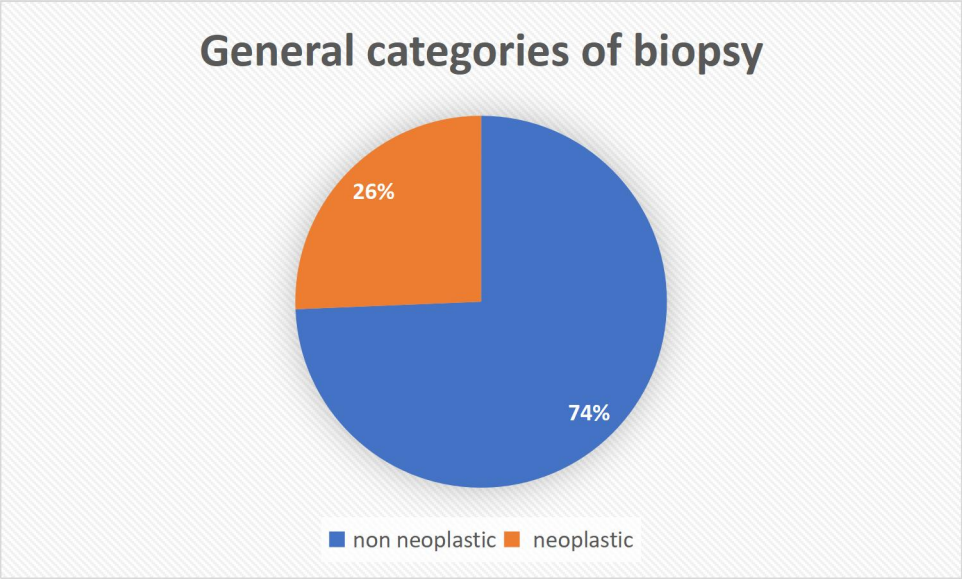



*Figure 5.1 general categories of testicular biopsies*

The figure above shows majority of the testicular biopsies are non neoplastic (74%) and the neoplastic conditions of the testis are 26%.

Table 5.3 clinical presentation of non neoplastic lesion

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | scrotal swelling | 24 | 30.8 | 31.2 | 31.2 |
| | Empty scrotum | 28 | 35.9 | 36.4 | 67.5 |
| | scrotal ulcer | 2 | 2.6 | 2.6 | 70.1 |
| | swelling and discharge | 9 | 11.5 | 11.7 | 81.8 |
| | scrotal swelling and pain | 6 | 6.4 | 6.5 | 88.3 |
| | gangrenous testis | 1 | 1.3 | 1.3 | 89.6 |
| | not specified | 8 | 10.3 | 10.4 | 100.0 |
| Total | | 78 | 100.0 | 100.0 | |

The above table shows the frequency distribution of clinical presentations, the most frequent mode of presentation being undescended testis accounting for 36.4% followed by scrotal swelling. There is more than one clinical presentation, the most frequent being testicular swelling

and pain 6.5%. The least common mode of clinical presentation is gangrenous testis accounting 1.3% of the clinical presentation.

Table 5.4 showing laterality of the non-neoplastic lesions

Laterality of non neoplastic lesions

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Left | 20 | 26.0 | 26.0 | 49.3 |
| | Right | 29 | 38.0 | 38.0 | 86.7 |
| | Bilateral | 6 | 6 | 6 | 90.7 |
| | Not mentioned | 23 | 30 | 30 | 100.0 |
| | Total | 78 | 100.0 | 100.0 | |

Among the non-neoplastic lesions of the testis right side testis the most involved one accounting for 36% and with bilateral conditions accounting for 6%.

Table 5.5 Age Group frequency distribution of non neoplastic

| Age group | | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Valid | 1-10 | 5 | 5.1 | 5.1 |
| | 10 to 20 | 25 | 44.2 | 44.2 |
| | 20 to 30 | 15 | 20.1 | 20.1 |
| | 30 to 40 | 7 | 16.5 | 16.5 |
| | >40 | 6 | 14 | 14 |
| | Total | 58 | 100.0 | 100.0 |

Across the board of nonneoplastic specimens added to 58 cases (76%) with a wide age range, the highest incident with in 2nd decade of life (44.2%) with mean age of 30.8 years and median of 30.2years.

Table 5.6 frequency distribution of histopathologic patterns of testicular biopsy

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | crypto/undesended | 20 | 25.6 | 34.5 | 34.5 |
| | Tuberculosis | 11 | 14.1 | 19.0 | 70.7 |
| | Atrophy | 10 | 12.8 | 17.2 | 51.7 |
| | granulomatous orchitis | 2 | 2.6 | 3.4 | 74.1 |
| | testicular abscess | 1 | 1.3 | 1.7 | 75.9 |
| | chronic non specific inflammation | 6 | 7.7 | 10.3 | 86.2 |
| | testicular torsion | 3 | 3.8 | 5.2 | 91.4 |
| | Biopsy | 2 | 2.6 | 3.4 | 94.8 |
| | necrotizing non specific inflammation | 2 | 2.6 | 3.4 | 98.3 |
| | xanthogranulomatous inflammation | 1 | 1.3 | 1.7 | 100.0 |
| | Total | 58 | 74.4 | 100.0 | |
| Missing | System | 20 | 25.6 | | |
| Total | | 78 | 100.0 | | |

Among the non-neoplastic lesions cryptorchidism was the leading testicular lesion accounting for (34.7%) followed by tuberclousorchits.

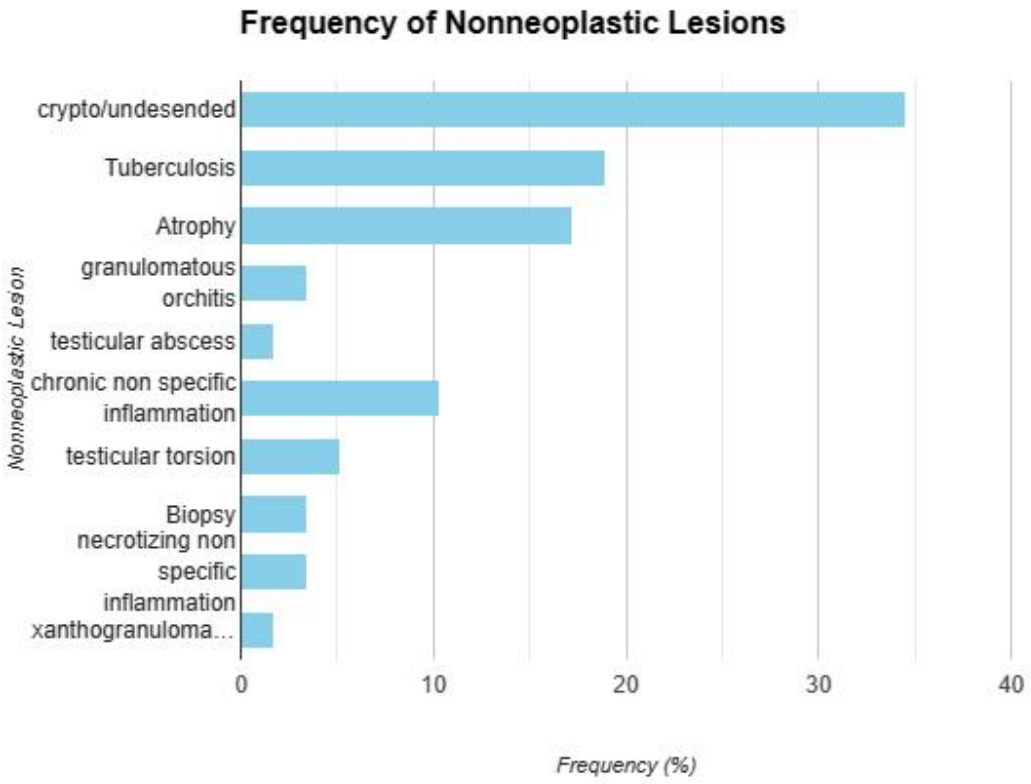



*Figure 5.2 histopathology distributions of non neoplastic testicular biopsies*

Among the non-neoplastic lesions of the testis undescended testis was the leading testicular lesion accounting for 34.7% followed by tuberculous orchitis 17%.

Table 5.7Group frequencydistribution of each non neoplastic lesions among Age groups

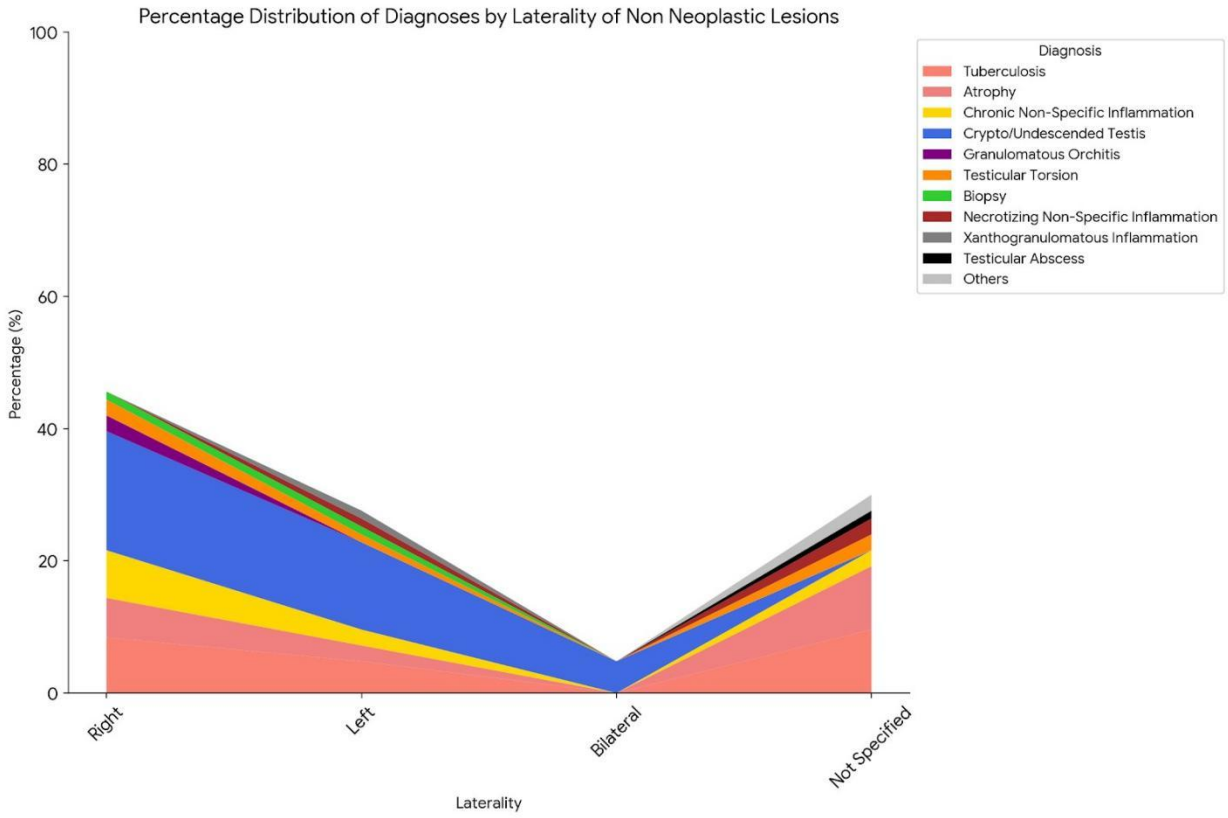
| | Age range | | | | | |
|---|---|---|---|---|---|---|
| | 1-10 | 11-20 | 21- 30 | 31-40 | >40 | Total % |
| Undescended Testis (Crypto/Undescended) | 12% | 62.50% | 22.17% | 0% | 3.33% | 100 |
| Chronic Non-Specific Inflammation | 3% | 19.54% | 29.16% | 6.61% | 41.69% | 100 |
| Necrotizing Non-Specific Inflammation | 10% | 21.73 | 0% | 0% | 68.27% | 100 |
| XanthogranulomatousInflammation | 0% | 0% | 0% | 0% | 100% | 100 |
| Tuberculosis | 0% | 10% | 42.9% | 36.90% | 10.2% | 100 |
| Testicular Abscess | 0% | 0 | 0% | 100% | 0% | 100 |
| Granulomatous Orchitis | 0% | 0 | 0% | 100% | 0% | 100 |
| -Biopsy | 0% | 0 | 0% | 0% | 100% | 100 |
| Testicular Torsion | 0% | 100% | 0% | 0% | 0% | 100 |
| Atrophy | 0% | 72% | 8.9% | 0% | 19.1% | 100 |

The above table shows most of non neoplastic conditions are in the second and third decade of life.

Table 5.8 frequency distribution of each non neoplastic lesions with laterality.

| | Laterality | | | | Total |
|---|---|---|---|---|---|
| | Right | Left | Bilateral | Not Specified | |
| **Tuberculosis** | 36.8% | 21% | 0% | 42.2% | 100 |
| **Atrophy** | 33.3% | 13.3% | 0% | 53.4% | 100 |
| **Chronic Non-Specific Inflammation** | 60% | 20% | 0% | 20% | 100 |
| **Crypto/Undescended Testis** | 50% | 36.6% | 13.4% | 0% | 100 |
| **Granulomatous Orchitis** | 100% | 0% | 0% | 0% | 100 |
| **Testicular Torsion** | 40% | 20% | 0% | 40% | 100 |
| **Biopsy** | 50% | 50% | 0% | 0% | 100 |
| **Necrotizing Non-Specific Inflammation** | 0% | 25% | 0% | 75% | 100 |
| **Xanthogranulomatous Inflammation** | 0% | 100% | 0% | 0% | 100 |
| **Testicular Abscess** | 0% | 0% | 0% | 100% | 100 |
| **Others** | 0% | 0% | 0% | 100% | 100 |

The above table shows most of non-neoplastic lesions of the testisare right sided with bilateral case being the least common.




The above graph shows most of non-neoplastic lesions of the testis are right sided with bilateral case being the least common and those with laterality being not mentioned holding a significant proportion.

*Figure 5.3 laterality of non neoplastic testicular biopsies*

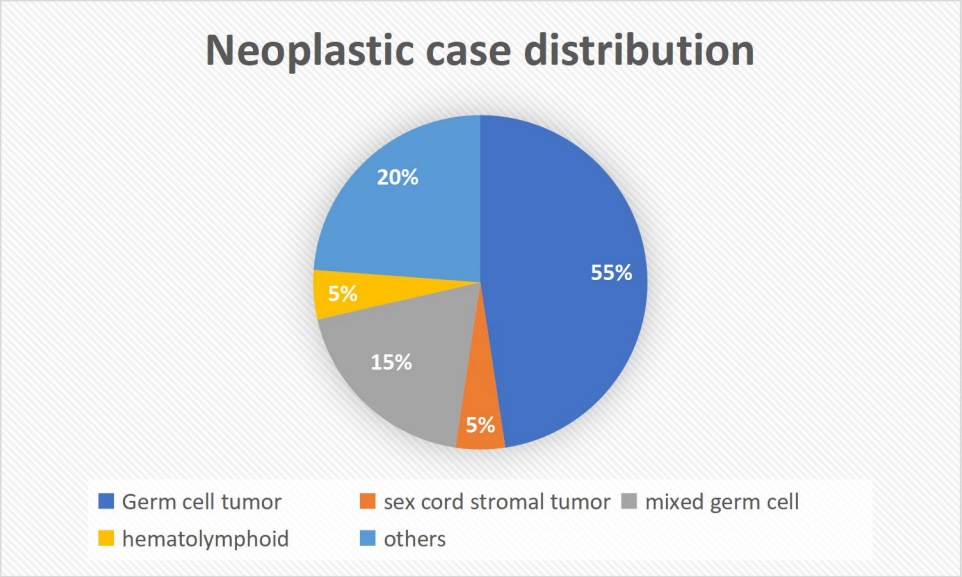



*Figure 5.4 frequency of neoplastic testicular lesions*

Analysis of the neoplastic lesions revealed that germ cell tumors were the most prevalent histological type, constituting eleven cases (55%).Mixed germ cell tumor accounting for 3 cases(15%) was the second among the testicular tumors with spectrum of histopathological combinations.paratesticular (others) tumors account for a significant part (20 %) of the neoplastic lesions

Table5.9 Frequency of clinical_presentation of patients with Neoplastic lesions

Count

| | | Neoplastic | | | | | |
|---|---|---|---|---|---|---|---|
| | | Germ cell tumor | sex cord stromal tumor | mixed germ cell | Hemato lymphoid | others | Total |
| clinical_presentation | scrotal swelling | 9 | 1 | 3 | 1 | 4 | 18 |
| | scrotal swelling and pain | 0 | 0 | 1 | 0 | 0 | 1 |
| | not specified | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | | 9 | 1 | 4 | 1 | 5 | 20 |

The above table shows almost >90% of patients with neoplastic lesion presented with testicular swelling

Table 5.10Age Group frequency distribution of neoplastic

| Age group | | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Valid | 1-10 | 2 | 10 | 10 |
| | 10 to 20 | 3 | 15 | 15 |
| | 20 to 30 | 7 | 35 | 30 |
| | 30 to 40 | 6 | 25 | 30 |
| | >40 | 3 | 15 | 15 |
| | Total | 20 | 100.0 | 100.0 |

Across the board of neoplastic specimens with in age range of 1–67 years and the highest incidence(60%) being in third and fourth decade of life with mean age of (34.6 years) and median of 34 years .

Table 5.11 frequency distribution of each neoplastic lesions

| Histological diagnosis | Frequency | %of total |
|---|---|---|
| **Testicular tumors** | | |
| **Germ cell tumor** | 1 | 5% |
| **GCNIS** | 5 | 25% |
| **Seminoma** | 1 | 5% |
| **Embryonal carcinoma** | 2 | 10% |
| **Yolk sac tumor** | 2 | 10% |
| **Mature Teratoma** | | |
| **Mixed germ cell tumor** | | |
| **Immature teratoma+embryonal carcinoma** | 1 | 5% |
| **Seminoma +yolk sac tumor** | 1 | 5% |
| **Embryonal carcinoma+yolk sac tumor** | 1 | 5% |
| **Sexcord stromal tumor** | | |
| **Sertoliledyig cell tumor** | 1 | 5% |
| **Hematolymphoid** | | |
| **Lymphoblastic lymphoma** | 1 | 5% |
| **Paratesticular tumors** | | |
| **Spindle cell rhabdomyosarcoma** | 1 | 5% |
| **Mucinous cystadenoma** | 1 | 5% |
| **Fibrous pseudotumor** | 1 | 5% |
| **Low grade fibromyxosarcoma** | 1 | 5% |

The above table shows most of cases of neoplastic condition being a germ cell tumor with one case each for Sertoli ledyig cell tumor and Lymphoblastic lymphoma.All of the testicular tumors are malignant except mature teratoma and Sertoliledyig cell tumor.

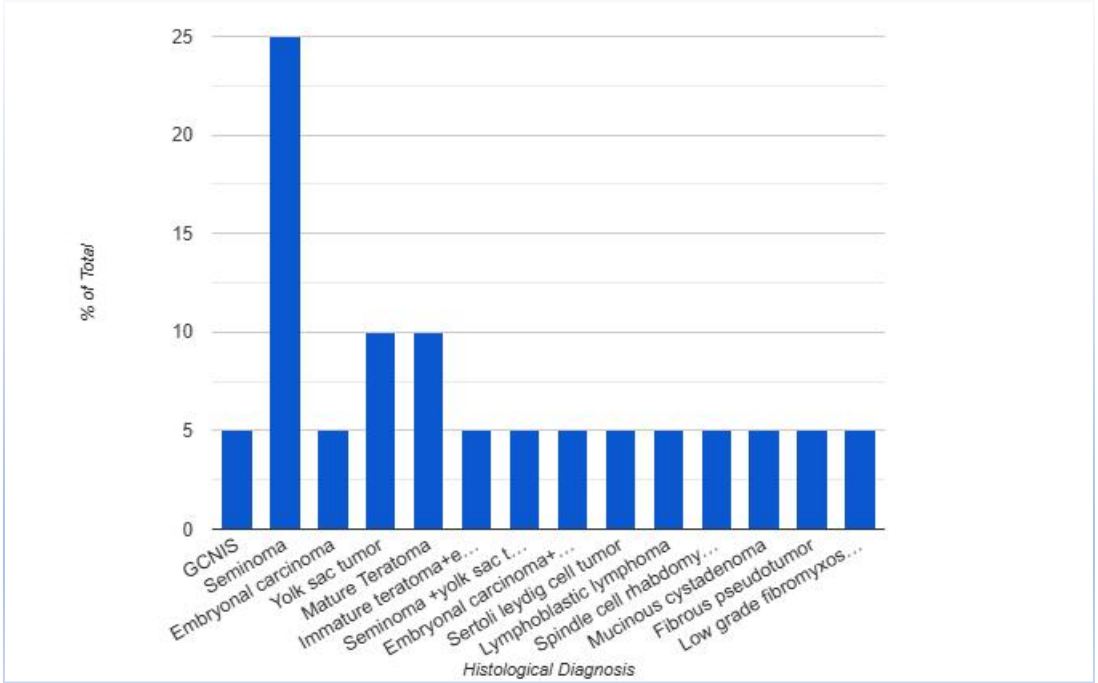



Figure 5.5 distribution of each neoplastic lesion

Seminomas are the most common type among the neoplastic tumour as well as germ cell tumor, accounting for approximately 5 cases (25% ) of the neoplastic lesions and 45% of among the germ cell tumors identified.

Table 5.12 frequency distribution of each neoplastic lesions with laterality

| Neoplastic | laterality | |
|---|---|---|
| | left | right |
| GCNIS | - | 1 |
| sertoli cell tumor | 1 | - |
| mixed germ cell tumor(immature teratoma and embryonal carcinoma) | 1 | 1 |
| embryonal carcinoma | - | 1 |
| spindle cell rhabdomyosarcoma | not specified | |
| mucinous cyst adenoma | 1 | - |
| seminoma | 1 | 4 |
| fibrous pseudotumor | - | 1 |
| low grade fibromyxosarcoma | 1 | - |
| lymphoblastic lymphoma | bilateral | |
| mixed germ cell tumor(immature teratoma and embryonal carcinoma | not specified | |
| yolk sac | - | 1 |
| mature teratoma | not specified | |

The above table shows a higher prevalence of neoplastic lesions in the right testis compared to the left .

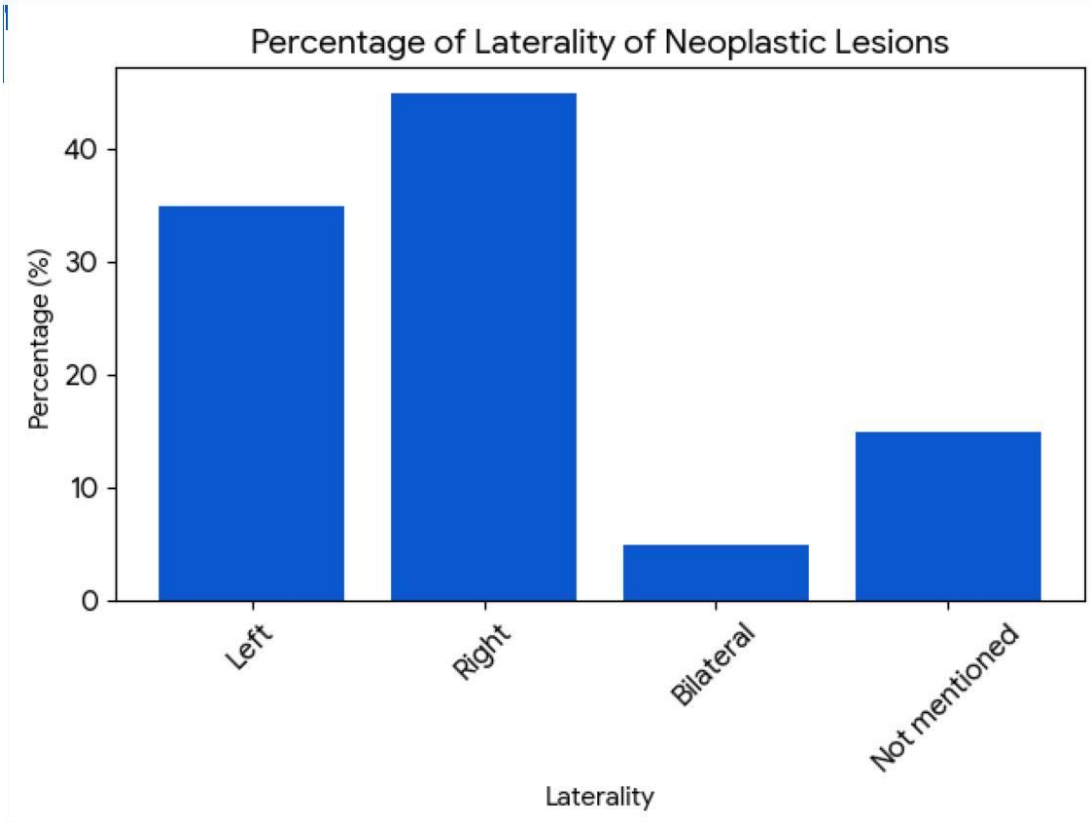



*Figure 5.6 laterality of neoplastic condition*

Analysis of the data revealed a predominance of involvement in the Right testis (45%) of cases. Additionally, a single case of bilateral involvement was observed, which was subsequently diagnosed as lymphoblastic lymphoma (5%)

Table 5.13 Pathological_Stage_presentation

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | PT1 | 3 | 30 | 30.0 | 30.0 |
| | PT2 | 4 | 40 | 40.0 | 70.0 |
| | PT3 | 3 | 30 | 30.0 | 100.0 |
| | Total | 10 | 100 | 100.0 | |

Our investigation revealed that only ten out of 20 patients were staged ,30% of patients (n=3) were diagnosed at stage PT1. Similarly, another 30% (n=3) were diagnosed at stage PT3. The remaining 40% (n=4) presented with stage PT2 disease. It is important to note that none of the patients had documented lymph node or distant metastasis.

## 6.DISCUSSION

A total of 96 cases were collected retrospectively from a five years data for analysis and interpretation, but 18 cases didn't met the inclusion criteria,incompletely filled and signed out as descriptive. Those 78 cases which met the criteria are finally ready for data analysis. Non neoplastic process dominated accounting for 74%. Across the board of nonneoplastic specimens added to 58 cases with age range of 1–72 years and the highest incident in second decade of life(44.2%) with mean age of 30.8 years which is comparable with studies from india(47.8%, mean age 32.8years ) and nigeria( 52.4%, mean 34.5 years).

Among specific orchitis, 11(19%) were tuberculous with the majority occurring in the second to fifth decade in contrast to studies in nigeria and india where non specific orchitis is the predominant with tuberculous orchitis accounting for only (6.6%) in nigeria and (3.7%) in india(10).this could be explained by lower preoperative diagnosis with FNAC.

This study identified neoplastic lesions in 20 (26%), which is comparable to the findings of a study done in india(12)., where neoplastic lesions were present in 15% of cases. The age range of individuals with neoplastic lesions in our study was 1 to 67 years old, with a mean age of 34 and highest incidence in the third decade . This is higher than the reported mean age of 28 years in a Tanzanian study(11) and slightly higher occurrence 34.8 years in a Kenyan study (9).

Almost >90% of neoplastic cases in this study presented with either testicular mass or testicular swelling . Testicular mass was the commonest presentation accounting for 89.49% in the Kenya study(9). Although testicular mass is commonest presentation of testicular malignancy, other less common manifestations such as , scrotal heaviness with pain, abdominal swelling and features of hormone imbalance like gynecomastia have been reported(9).. Cryptorchidism, known risk factor for testicular malignancy, has been reported in one of the patient diagnosed with germ cell neoplasia insitu (GCNIS). Right testes were affected more accounting for 45 % which is comparable to study done in Pakistan right testes affected in 46.5%(15) . However, a marked right side preference was alspnoted in a study in nigeria, where right testis involvement was 67.9%(11).

In our study, the histological pattern and behaviour of the testicular tumours differs with age. Testicular neoplasm of germ cell origin is the most common malignancy accounting for 55%. Amongst the germ cell tumors, seminoma (45.4%) was the most common type which is comparable to study done in Pakistan seminoma holding 43.44%(15).The age related data reveals that seminoma was the most common lesion encountered, with 90% of the patients between 10 to 30 years of age. There was a predominance (60%) of right-sided tumours. Bilateral seminoma was not seen. Mixed germ cell tumour was the second common testicular tumor in frequency, accounting for 15 % of all cases. All of the patients presented between the ages of 15 to 30 years. A broad spectrum of histopathological combinations was encountered in this subgroup where (2/3) cases were imature teratoma with embryonal carcinoma.Only 1 case

(5%) of testicular lymphoma were reported with bilateral testicular involvement,similarly only one case of sex cord stromal tumor(sertoli cell tumor) were reported with comparable finding from pakistan (4%) and (5.7%) respectively.

In our analysis paratesticulartumors account for a significant part (20 %) of the neoplastic lesions with spindle cell rhabdomyosarcoma (1 case) ,mucinous cyst adenoma (1case), fibrous pseudotumor(1 case) and lowgradefibromyxosarcoma(1 case). only 3 cases of spindle cell rhabdomysarcoma have been reported in kenya.

Analysis revealed a significantly higher proportion of patients (70%) presenting with disease stages (PT2 and above) compared to a Kenyan study (where >50% presented at PT1). This disparity suggests potential delays in diagnosis in our patient population. Limited public awareness regarding this condition in our country could be a contributing factor.

## STRENGTH AND LIMITATION OF THE STUDY

- Despite being single-center study, the study is representative of neoplastic lesions since TASH is the primary referral center for cancer patient across the country.
- This study encompasses both neoplastic and non-neoplastic lesions, providing a comprehensive analysis of testicular pathologies.

- ✓ The demographic and clinical data on the request forms were incomplete.
- ✓ This study is limited to biopsies performed at this hospital, potentially leading to an underestimation of the true incidence within the population
- ✓ Additionally, inconsistencies were identified in how cases were reported.

## CONCLUSION

Since the study aims to characterize the spectrum of testicular lesions observed in orchidectomyspecimens.Based on our study, the majority of patients with testicular lesions are young. Non-neoplastic lesions are prevalent during the second decade of life, whereas neoplastic lesions are more common in the third and fourth decades.Analysis of testicular biopsies revealed that the majority were non-neoplastic lesions. Undescended testes constituted a significant portion of these non-neoplastic cases, followed by tuberculosis. Neoplastic lesionswere identified in 26% (20 out of 78) of biopsies, which aligns with findings from similar studies conducted in Kenya, Nigeria,india and Pakistan..Germ cell tumors were the most prevalent testicular malignancy. Within this category, seminomas represented the highest proportion at 45.4%, with the commonest age range being between 15 to 30 years. Notably, seminomas affected the right testis commonly. Leukemic infiltration (5%) and mixed germ cell tumors (15%) followed in prevalence. Encouragingly 70 % of patients presented at stage (PT1) and (PT2). No lymph node or distant metastasis was reported in any of the cases.

## 9.RECCOMENDATION

- A national cancer registry is crucial to understanding the true burden of various malignancies in our country.
- The reporting of certain non-neoplastic lesions exhibited inconsistencies. For instance, some cases of undescended testis were diagnosed as testicular atrophy. In such instances, where a clinical history of undescended testis is documented, it is preferable to report the diagnosis as "features of undescended testis" rather than focusing on the secondary change (atrophy).
- Adopting a uniform method of reporting, such as the CAP protocol, could potentially prevent Some inconsistency.
- 
  - ✓ It is imperative to report any association with In Situ Germ Cell Neoplasia (GCNIS).
  - ✓ Neoplastic conditions exhibiting mixed features do not provide a percentage breakdown of each tumor type, given their prognostic significance.
  - ✓ Laterality
- Important clinical, radiological and laboratory information's are not registered routinely on majority of the patients.
- For future researches, to avoid incomplete data, prospective follow up study with larger sample size is advised.

- Considering the relatively rare occurrence of paratesticular lesions case reports detailing such presentations could be published as it holds significant value for the medical literature.

- Awareness creation about undescended testis since cases in older individual might be associated neoplastic condition like for instance Germcell neoplasia insitu.
- Awareness creation in the field of pediatrics for routine evaluation of undescended testis during early ages
- Unnessesary orchidectomy/biopsies for cases like Tuberculosis can be avoided by FNAC

10.ANNEX

**Questionary**

**Age?**

**Previous diagnosed testicular tumor or tumor-like lesion?**

**symptoms related to the tumor or tumor like lesion?**

**Tumor unilateral or bilateral?**

**Right or left testis?**

**Histopathological diagnosis?**

**Histological subtype of testicular tumor or tumor-like lesion**

**GCNIS ?**

**The stage of testicular tumor?**

**any laboratory tests or serum markers**?

**Imaging before histopathological diagnosis**

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