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ORIGINAL ARTICLE

Histomorphological Analysis of Testicular Specimens at Tertiary Care Hospital in Western Rajasthan – A Retrospective Study

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Abstract

Introduction: Numerous etiologies, categorised as Neoplastic and Non-Neoplastic lesions, can affect the testis. Non-neoplastic conditions are further broken down into important categories such as congenital anomaly, inflammation or infection, vascular disorders, and atrophy caused by various etiologies. Neoplastic lesions are far less common than non-neoplastic lesions, but their early detection is crucial for managing them and understanding age distribution.

Objectives: Our study aims to analyze Histomorphological spectrum of various testicular specimens as well as to calculate age incidence of various testicular lesions.

Material and Methods: This retrospective study of five years from January 2017 to December 2021 with total of 100 specimens conducted in department of pathology of jhalawar medical college. All orchidectomy specimens managed further and examined microscopically.

Results: Overall, it was discovered that non-neoplastic lesions were more prevalent than neoplastic lesions (85% vs. 15%). The most frequent non-neoplastic lesions were torsion/infarction (38%), followed by both cryptorchidism (14%) and Non specific inflammatory lesions (14%). Seminoma (40%) is more frequent than embryonal carcinoma (26.67%) among neoplastic tumours, which is thought to be the second most frequent. Inflammatory lesions are substantially less common among younger age groups, according to our research.

Conclusion: Comparing histopathogical evaluation to recently developed molecular techniques, we found it to be a very simple, logical, and effective instrument. It turns out to be quite useful for both identifying different testicular lesions and categorising their age occurrences.

Key words*:* Orchidectomy, Testicular Lesions, Torsion, Seminoma

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Introduction

A wide variety of non-neoplastic and neoplastic lesions can affect the testicles. Neoplastic lesions are less common to arise than non-neoplastic lesions, nonetheless. using tumour markers assays or ultrasonography as support for various non-invasive treatments while using histomorphological inspection as a key first resource in improving treatment decision-making. The epidemiology of distinct testicular non-neoplastic and neoplastic lesions varies greatly across different geographic borders. Worldwide, it is estimated that 1-2% of children aged 3 to 12 months have undescended testes or have cryptorchidism. In a similar vein, neoplastic lesions like germ cell tumours, which most frequently affect people between the ages of 15 and 45, account for only 1-2% of all male malignant tumours [1, 2, 3].

Congenital abnormalities, infertility, inflammation and infection (Epididymitis, Orchitis of various origin), vascular disorders (systemic vasculitis, varicocele, torsion and infarction), atrophy, and other non-neoplastic pathologic conditions all affect the testis [4].

The testis is affected by a variety of cancers, but their occurrence is considerably lower than that of benign or non-cancerous illnesses. These cancers can be further divided into germ cell tumours of the testis (Seminoma, Yolk sac tumour, Teratoma, etc.), non-germ cell tumours, and secondaries [15].

Material and Methods

100 testicular specimens in total were received at the pathology department of the Jhalawar Medical College and Hospital throughout a five-year period from January 2017 to December 2021. Samples were fixed in 10% formalin. Following a gross evaluation, the tissue was treated using an automated tissue processor, which included paraffin embedding, sectioning, and hematoxylin and eosin staining. According to WHO categorization, various lesions will be histomorphologically categorised.

Inclusion Criteria

Simple orchidectomy specimens, Bilateral simple orchidectomy specimens, Radical orchidectomy specimens and high inguinal orchidectomy specimens received in Pathology Department, Jhalawar medical college and Hospital, Jhalawar.

Exclusion Criteria

Biopsies received for infertility evaluation are excluded from study.

Methodology

Only those patients who meet the inclusion and exclusion criteria will be enrolled for the study after receiving approval and clearance from the ethical committee.

Gross Examination

1. When orienting the specimen, keep in mind that the epididymis can be felt superiorly and posteriorly, and that the cord structures pass superiorly.
2. Measure both the specimen and the length of the cord.

3. Beginning at the spermatic cord's tip, ink the cord cut margin.
4. Separate the testis into many parallel pieces starting from the base of the cord and moving toward the tunica. sufficient fixing portions. Fix the sample for 12 to 24 hours.
5. After fixing, cut a whole portion of the specimen's cord-cut margin after determining its separation from the tumor's or the cord's base.
6. Examine and characterise the tumor's size, shape, colour, texture, and areas of necrosis and haemorrhage. Keep an eye out for the development of hair, cartilage, bones, and teeth.
7. Visually evaluate the tumor's size in respect to the tunica layers, the epididymis, the rete testis, and the cord's base.
8. Before submitting sections from the tumour, take sections from the cord's base.
9. Take sections of the tumour for microscopic examination: one section for every cm of the tumour; sections with layers of tunica; sections with rete or epididymis; portions with any remaining native testicular tissue.
10. If the surgeon has sent a primary retroperitoneal lymph nodal dissection, gross the nodes and submit them.

Observation and Results

In the present study most common lesion was found to be torsion and infarction accounting for 38 cases, 38% (n = 100) followed by next common both cryptorchid lesion and Non specific inflammatory lesions recorded for 14 cases each, 14%. The other lesions with their incidence are classified in Table 1.

Table 1. Histomorphological Lesions Among Testicular Specimens.

HISTOMORPHOLOGICAL DIAGNOSIS	CASES
NEOPLASTIC	
SEMINOMA	6
EMBRYONAL CARCINOMA	4
TERATOMA	3
YOLK SAC TUMOR	2
NON NEOPLASTIC LESIONS	
NORMAL	8
CRYPTORCHID	14
TORSION AND INFARCTION	38
ATROPHY	4
NON SPECIFIC INFLAMMATORY LESIONS	14
TUBERCULAR ORCHITIS	1
ABSCESS	6
TOTAL	100

In this study it is observed that out of 100 cases, 85 cases reported for non neoplastic lesions (85%) and 15 cases were reported for neoplastic origin (15%). Among all age groups incidence of non neoplastic lesions are higher compared to neoplastic lesions, incidence of neoplastic lesion among age group >60 years is nil as not a single neoplastic lesion reported under this group (Table 2).

Table 2. Incidence of Neoplastic and Non neoplastic Lesions age group wise.

LESIONS	0-20 Years	21-40 Years	40-60 Years	>60 Years	Overall Percentage
	(n = 27)	(n = 35)	(n = 26)	(n = 12)	(n = 100)
NON NEOPLASTIC LESIONS	92.59%	74.29%	84.62%	100%	85%
NEOPLASTIC LESIONS	7.41%	25.71%	15.38%	0	15%

Among age group 0-20 years there is equal incidence of embryonal carcinoma and yolk sac tumor as 6.67%, in group 21-40 years incidence of seminoma is higher as 26.67%, not a single neoplastic case is reported in group >60 years. Among neoplastic lesions seminoma is the most common lesion in present study (Table 3).

Table 3. Incidence of Different neoplastic lesions age group wise.

NEOPLASTIC LESIONS	0-20 Years	21-40 Years	40-60 Years	>60 Years	Overall Percentage
(n = 15)					
SEMINOMA	0	26.67%	13.33%	0	40%
EMBRYONAL CARCINOMA	6.67%	13.33%	6.67%	0	26.67%
TERATOMA	0	13.33%	6.67%	0	20%
YOLK SAC TUMOUR	6.67%	6.67%	0	0	13.33%
OVERALL PERCENTAGE	13.33%	60.00%	26.67%	0	

Table 4. Incidence of Different Non neoplastic lesions age group wise.

NON NEOPLASTIC LESIONS	0-20 Years	21-40 Years	40-60 Years	>60 Years	Overall Percentage
	(n = 85)				
NORMAL	0	1.18%	3.53%	4.71%	9.41%
CRYPTORCHID	1.18%	7.06%	4.71%	3.53%	16.47%
TORSION AND INFARCTION	28.24%	11.76%	4.71%	0	44.70%
ATROPHY	0	2.35%	0	2.35%	4.71%
NON SPECIFIC INFLAMMATORY LESIONS	0	5.88%	9.41%	1.18%	16.47%
TUBERCULAR ORCHITIS	0	1.18%	0	0	1.18%
ABSCESS	0	1.18%	3.53%	2.35%	7.06%
OVERALL PERCENTAGE	29.42%	30.59%	25.88%	14.12%	

In age group 0-20 years most common non neoplastic lesion found to be torsion or infarction with incidence of 28.24%, In 21-40 years of age group most common lesion is again torsion or infarction with 11.76%, in group 40-60 years Non Specific inflammatory lesions (9.41%) are most common, In group >60 years most testis are having normal architecture done mainly for hormonal ablation in prostatic carcinoma (Table 4).

Discussion

In present study most common lesion among non neoplastic group is found to be torsion or infarction including gangrenous testis with incidence of 44.70% followed by both cryptorchidism and inflammatory etiology with an incidence rate of 16.47% respectively in total of 85 non neoplastic lesions which is comparable Baidya R et al. [20] with incidence of Torsion or infarction as 54.90%, There is quite variation in incidence of different non neoplastic lesions because of various geographical and environmental factors or boundations. (Table 5).

Among neoplastic lesions most common lesion is found to be seminoma with an incidence rate of 40% followed by embryonal carcinoma having incidence rate of 26.67% among total of 15 cases of neoplastic origin in comparison to other studies Buge Aarti el al [10] Seminoma is common with incidence of 37.5%, Tekumalla A et al [13] again seminoma is most common with incidence of 40%, In Baidya R el al [20] seminoma is the most common lesion (44.44%) Among neoplastic lesions seminoma is the most common lesion in almost all the studies which is comparable to our study (Table 5).

Table 5. Comparison of different Histomorphological lesions in different studies.

NON NEOPLASTIC LESIONS	Buge Aarti et al (2020) Maharashtra	Tekumalla A et al (2019) Telangana	Baidya R et al (2017) North East	Mansi Sharma et al (2017) Jammu	Present Study
	(n = 31)	(n = 65)	(n = 51)	(n = 53)	(n = 85)
NORMAL	0.00%	21.50%	0.00%	0.00%	9.41%
ABSCESS	12.90%	0.00%	15.68%	5.66%	7.06%
ATROPHY	12.90%	23.10%	0.00%	16.98%	4.71%
CRYPTORCHID	9.68%	4.60%	7.84%	39.62%	16.47%
INFLAMMATORY ETIOLOGY	32.26%	38.50%	9.80%	15.09%	16.47%
TUBERCULAR ORCHITIS	9.68%	0.00%	9.80%	3.77%	1.18%
TORSION/INFARCTION/GANGRENOUS	16.13%	12.30%	54.90%	18.86%	44.70%
OTHERS NON NEOPLASTIC	6.45%	0.00%	1.96%	0.00%	0.00%
NEOPLASTIC LESIONS	(n = 8)	(n = 15)	(n = 9)	(n = 4)	(n = 15)
TERATOMA	25.00%	13.34%	11.11%	25.00%	20.00%
SEMINOMA	37.50%	40.00%	44.44%	25.00%	40.00%
EMBRYONAL CARCINOMA	0.00%	0.00%	0.00%	0.00%	26.67%
YOLK SAC TUMOUR	0.00%	6.67%	0.00%	25.00%	13.33%
OTHERS NEOPLASTIC	37.50%	40.00%	44.44%	25.00%	0.00%

In present study it is observed that out of 100 cases, 85 cases reported for non neoplastic lesions (85%) and 15 cases were reported for neoplastic origin (15%) which is comparable with other studies stated in Table 6.

Table 6. Comparison of Non Neoplastic and Neoplastic lesions in different studies.

STUDIES	Non Neoplastic Lesions	Neoplastic Lesions
Tekumalla A et al (2019)	81.25%	18.75%
Ali Abdul Latheef et al (2019)	91.30%	8.70%
Kalpana R et al (2018)	92.86%	7.14%
Charak A et al (2018)	90.20%	9.80%
Baidya R et al (2017)	85.00%	15.00%
Hemavthi Reddy et al (2016)	86.00%	14.00%
Present Study	85.00%	15.00%

Conclusion

There is a wide diversity of histopathology in testicular lesions. Compared to neoplastic lesions, Non neoplastic lesions are substantially more prevalent. The most frequently researched non-neoplastic lesion is torsion or infarction. Seminoma is the most prevalent neoplastic lesion. All age groups experience non-neoplastic lesions on a regular basis, however as people age, the frequency of neoplastic lesions declines. As clinical or USG findings may mistake a neoplastic lesion for a non-neoplastic one or vice versa, histopathological diagnosis is thought to be the gold standard method for making a final determination regarding the diagnosis of various testicular lesions. Most of the differences between our study and other studies are attributable to the differences in sample sizes, as well as geographic and environmental boundaries.

Statements and Declarations

Competing Interests – No Direct or Indirect financial aid was taken to conduct this study.

Conflict of Interest – No conflict of interest.

Author Contributions

Dr. Viral Jain – Study Conception and Design Along With Data Collection

Dr. Richa Sharma – Reporting of Cases with Analysis of Results

Dr. Rishi Diwan - Reporting of Cases with Draft Preparation

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