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Original Research Article

A Retrospective Study on Histopathological Spectrum of Testicular Lesions

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Abstract:

Background: Both neoplastic and non-neoplastic diseases can affect the testis. Although they are uncommon, testicular neoplasms have been the focus of the majority of testis research in the past.

Aim: Aims of our study to determine the histological range, age-wise distribution, laterality, and clinical manifestation of all testicular lesions (both neoplastic and non-neoplastic).

Material and Methods: This was a one year retrospective study including all the testicular specimens referred to Department of Pathology, NMCH, Patna, Bihar from March 2022 to February 2023.

Results: The study comprised a total of 57 cases. Non- neoplastic testicular lesions were more common than the neoplastic ones (93 vs. 7%). In the second decade of life, non-neoplastic lesions were most prevalent in people between the ages of 5 months and 80 years. The most frequent non-neoplastic lesions (n=53) were undescended testicles (39.62%), inflammatory lesions (24.53%), infarcted testicles (torsion, 18.86%), and atrophic testicles (16.98%). Non-specific epididymo-orchitis (15.1%), testicular abscess (5.66%), and tubercular epididymo-orchitis (3.77%) were among the inflammatory lesions. During the study period, there were only 4 diagnoses of testicular neoplasm (7%)—only 1.33 cases per year. With an age range of 14 months to 35 years and a mean age of 20.54 years, all 4 cases were germ cell neoplasms. Seminoma, yolk sac tumor, immature teratoma, and mixed germ cell tumor (teratoma and seminoma) were all diagnosed in one case each. All of the lesions were unilateral, and 58% of them were non-neoplastic. Testicular (scrotal/inguinoscrotal) edema was the most prevalent symptom in both neoplastic and non-neoplastic lesions (87%). Empty scrotum and soreness were the second-most frequent presenting complaints (36.84% and 36%, respectively). Additionally, fever was a history for the inflammatory lesions (22.8%). In contrast to western countries, no tumor was discovered in undescended testes.

Conclusion: The majority of testicular lesions are benign, whereas neoplastic lesions are uncommon—most commonly, germ cell tumors. Neoplasms are typically observed in younger age groups, although non-neoplastic lesions are present in all age groups. Clinically, non-neoplastic lesions can resemble neoplastic ones; testicular enlargement is the most typical symptom. So that an appropriate diagnosis of testicular swellings may be made, histological examination is required. Our results align with those of the majority of studies.

Keywords: Undescended testis, Germ cell neoplasm, Epididymo-orchitis, seminoma, teratoma, yolk sac tumour, Non-neoplastic.

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Introduction

Both non-neoplastic and neoplastic diseases can affect the testis. Testicular lesions can affect people of all ages, from children to adults. They typically exhibit scrotal edema, discomfort, and an abdominal lump. Cryptorchid (undescended) testis, testicular torsion, testicular atrophy, epidermoid cysts, infections of the testes such tuberculosis, infertility, malakoplakia, and vasculitis are examples of non-neoplastic testicular diseases. [1]

The most prevalent genital abnormality in boys is an undescended testis, which affects about 1% of boys at age one [2,3]. A germ cell tumor is more likely to grow in an undescended testis than in a testis that is in its usual position. Cryptorchidism, mumps orchitis, liver cirrhosis, estrogen medication, radiation exposure, chemotherapy, AIDS, and exposure to environmental contaminants can all cause testicular atrophy. [4] Torsion of the testis is a surgical emergency that typically affects people between the ages of 10 and 25. [5] Age-related differences in the cause of non-specific epididymo-orchitis, which is frequently linked to infections of the urinary tract. It might develop into a true abscess. [6] A typical variation of genitourinary tuberculosis is tubercular epididymo-orchitis. It may coexist with TB of the lungs or TB of the lower genitourinary system. It nearly always starts in the epididymis before spreading to the

testis. Even while solitary cases are uncommon, they can resemble testicular tumors when they do. [7]

Despite being relatively uncommon, testicular tumors are very important and of considerable interest due to their various histological appearances and the differing or even opposing perspectives maintained regarding their histogenesis. [8] They make up less than 1% of all male malignancies and are the fourth most common cause of neoplastic death in younger men, who are often found in the age range of 15 to 35. Over the past 50 years, testicular neoplasia has become more common in western nations. [9] Although the exact cause of testicular cancer is unknown, a number of factors, including cryptorchidism, trauma, infections, hereditary and endocrine factors, seem to play a part in the disease's emergence. [10] Testicular tumors exhibit a distinct regional and racial distribution. [11] In contrast to most malignancies, testicular carcinoma has a declining incidence rate with aging. [12]

Clinically, testicular tumors are frequently diagnosed after they have progressed. [12] Despite advances in imaging technology and tumor marker testing, histological analysis still plays a major role in the diagnosis of testicular tumors. [5] The histological identification of tumors and lesions that resemble tumors is ultimately what the urologists, radiologists, and chemotherapists rely on. [13] Because histopathological characteristics play a significant role in defining the prognosis and treatment options. [14]

Material and Methods

This was one year retrospective study including all the testicular specimens referred to Department of Pathology, Nalanda Medical College, Patna from March 2022 to February 2023. Patients with prostatic cancer undergoing bilateral orchidectomy were not included in this study. The slides and histology requisition forms, which contained clinical information, were all retrieved and examined. The WHO classification from 2004 was used to classify the tumors. [15] The data was collated, analyzed, and contrasted with findings from other studies of a similar nature.

Results

A total of 57 cases were included in the study. The prevalence of non-neoplastic testicular lesions was higher than that of neoplastic ones (93 vs. 7%, n=53 vs. 4). The most frequent non-neoplastic lesion was an undescended testis (39.62%; n = 21), which was followed by inflammatory lesions (24.53%; n = 13), infarcted testis (torsion, 18.86%; n = 10) and atrophic testis (16.98%; n = 9). A testicular abscess (5.66%, n=3), a tubercular epididymo-orchitis (3.77%, n=2), and nonspecific epididymo-orchitis (15.09%, n=8) were among the inflammatory lesions (Fig. 1).

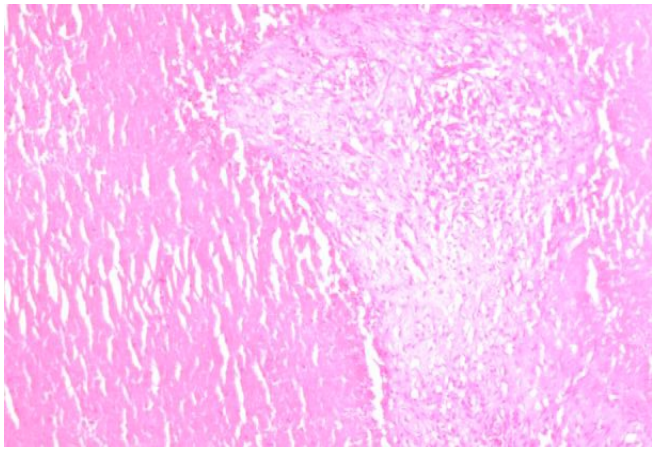

Figure 1: Tubercular epididymo- orchitis (H&E, 200X)

In the study period, there were only 4 diagnoses of testicular neoplasm, or 1.33 cases per year. Germ cell tumors were present in all 4 patients. Seminoma, yolk sac tumor, immature teratoma, mixed germ cell tumor (teratoma and seminoma), and seminoma were all detected in one case each. There were no signs of lymphoma, metastases, or sex cord stromal tumors.

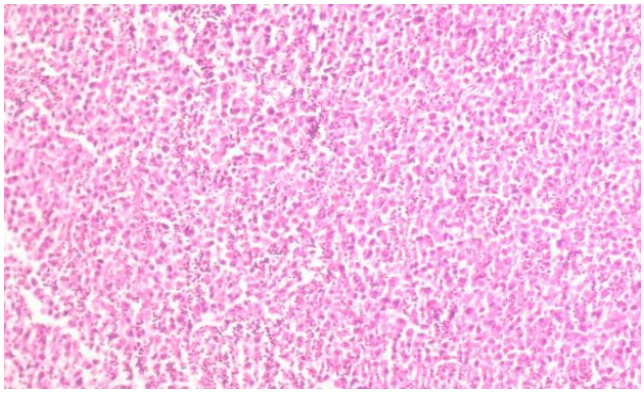

Figure 2: Seminoma. Note lymphocytes in septae in between lobules of round uniform cells with clear cytoplasm and central nuclei. (H&E, 200X)

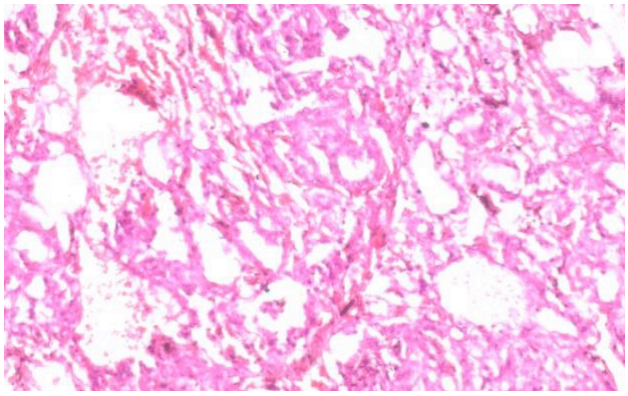

Figure 3: Yolk sac tumour showing microcystic pattern (H&E, 200X)

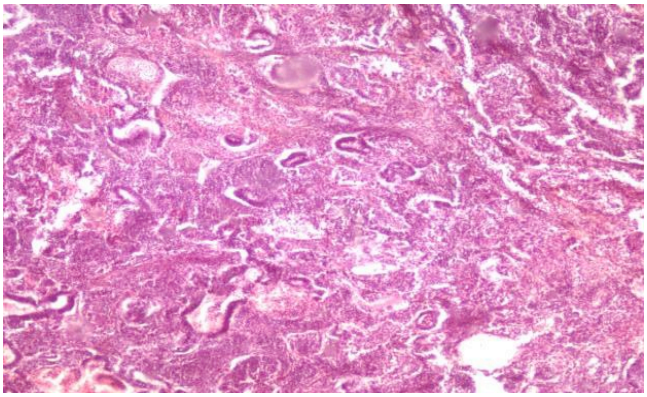

Figure 4: Immature teratoma showing immature neuroectodermall tissue (H&E, 200X)

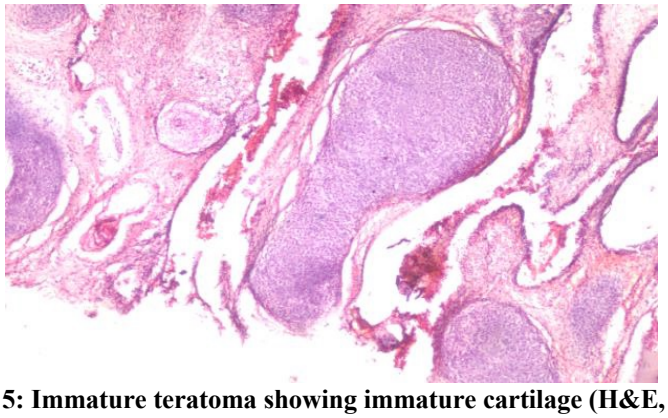

Figure 5: Immature teratoma showing immature cartilage (H&E, 200X)

The second decade of life, with a large age range of 5 months to 80 years and a mean age of 35.64 years, was when non-neoplastic lesions were most prevalent. Age ≤30 was present in 54.71% of cases.

The most prevalent non-neoplastic lesion in our study—undescended testis—occurred most frequently in the second decade, with a mean age of 20.5 years and an age range of 5 months to 65 years. 86% of the population was ≤ 30.

Infarcted testis (torsion) cases ranged from 14-48 years with 70% ≤30years and 24.1 years mean age. They were also most common in second decade. Testicle atrophies ranged in age from 22 to 75, with a mean of 47.11 years. In the third decade of life, they were most prevalent.

The majority of occurrences of inflammatory lesions, the second most prevalent non-neoplastic lesions, occurred in the sixth decade and affected people aged 28 to 80.

The average age was 50.86. The mean ages of tubercular epididymo-orchitis, nonspecific epididymo-orchitis, and abscess among inflammatory lesions were 65.75, 42.33, and 51.5 years, respectively. Ages of the 4 neoplastic cases ranged from 14 months to 35 years on average, and all 4 were germ cell neoplasms.

Table 1: Histopathological spectrum of non-neoplastic testicular lesions along with age distribution

Lesion	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Undescended testis	4	10	4	1	1	0	1	0	21 (39.62%)
Torsion testis	0	6	1	2	1	0	0	0	10 (18.86%)
Atrophic testis	0	0	3	0	2	2	1	1	9 (16.98%)
Nonspecific epididymo-orchitis	0	0	0	1	1	4	1	1	8 (15.09%)
Testicular abscess	0	0	1	0	1	1	0	0	3 (5.66%)
Tubercular epididymo-orchitis	0	0	0	1	0	0	1	0	2 (3.77%)
Total	4	16	9	5	6	7	4	2	53 (100%)
Percentage	7.5%	30.19%	16.98%	9.43%	11.32%	13.21%	7.55%	3.77%	100%

Table 2: Age distribution of neoplastic testicular lesions

Lesion	0-10	11-20	21-30	31-40	Total
Seminoma			1 (28 years)		1 25%)
Immature teratoma		1 (18 years)			1 25%)
Yolk sac tumour	1 (14 months)				1 25%)
Mixed germ cell tumour (Mixed seminoma and teratoma)				1 (35 years)	1 25%)
Total	1	1	1	1	4 (100%)

All of the lesions were one-sided. Right-sided lesions made up 58% of non-neoplastic lesions and 50% of neoplastic lesions.

The most prevalent symptom of both neoplastic and non-neoplastic lesions was testicular (scrotal/inguinoscrotal) enlargement. Swelling was seen in 83.02% (n=44) of non-neoplastic lesions, with painless swelling in 50.94% of cases. Pain (32.07%) was the second most frequent presenting complaint, followed by empty scrotum (39.62%).

Discussion

Testicular lesions that were not cancerous were more prevalent in our study than those that were (93 vs. 7%). This agrees with Reddy H et al (86 versus 14%) and Patel MB et al (85 vs 15%), but not Robertson GS et al (31.5 vs 68.4%). Similar to earlier studies [1,5], testicular edema was the most prevalent symptom in the current study [16]. In our research and those of Patel MB [5], right testis involvement was more frequently observed; however, Reddy H et al. [1] discovered the opposite pattern. The most prevalent non-neoplastic lesion varies depending on the investigation. Inflammatory lesions and undescended testes were the most prevalent findings. The most frequent lesion according to earlier investigations is torsion. Similar to Patel MB, we discovered that non-neoplastic lesions were most prevalent in the second decade of life. [5]

In contrast to earlier studies, more than 50% of participants in our study were under the age of 30. The relative proportion of the various histological types varies, which is the source of this change. The age distribution of each non-neoplastic lesion was discovered to be consistent with earlier research. Testicular tumors were discovered in the current investigation to be uncommon, as indicated in the literature. In fact, we discovered that they were less common than in earlier research. In our

three-year investigation, we only discovered 4 cases or about 1.33 cases annually. Testicular tumor incidence varies between nations and regions, suggesting a number of potential causes. [24]

According to Mostofi and Price [25], more than 94% of testicular tumors are germ cell tumors, while 3% are stromal tumors. The outcomes of other trials were comparable. Testicular neoplasms only occurred in 100% of our instances as germ cell tumors. There were no signs of lymphoma, metastases, or sex cord stromal tumors.

The histological pattern and behavior of testicular tumors vary with age, according to the literature. For men between the ages of 18 and 35, the most prevalent cancer is testicular neoplasm of germ cell origin. [27] Men under the age of 40 also accounted for all of our instances. It is known that non-seminomatous tumors commonly manifest earlier than seminomatous types. [28]

A pure seminoma was discovered in the third decade, a mixed germ cell tumor with a seminoma component was discovered in the fourth decade, and two non-seminomatous tumors were discovered in the first and second decades, respectively: a yolk sac tumor and an immature teratoma. 10% of all individuals with testicular cancer have a history of cryptorchidism, making it the single most significant risk factor for the disease. [20]

Despite the fact that we discovered 21 instances of undescended testes, none of them displayed a neoplastic focus, and none of the 4 instances of testicular neoplasms had a history of undescended testes. Our results agree with those of Reddy H et al. [1] the majority of our findings are consistent with earlier research.

Variations may have been missed due to a lack of instances, particularly those involving tumors. It is advised to conduct a follow-up study with a bigger study population over a longer time frame.

Conclusion

The majority of testicular lesions are non-neoplastic, whereas the majority of neoplastic lesions are germ cell neoplasms. Neoplastic lesions are common in younger age groups, although non-neoplastic lesions occur in all age groups.

Testicular edema is the most typical symptom of non-neoplastic lesions that mimic neoplastic ones clinically. An reliable diagnosis of testicular swellings therefore requires a histological study.

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