Clinicopathological study of testicular lesions in a tertiary care centre: A comprehensive analysis

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Abstract:

Aim: To study the clinicopathological spectrum of testicular lesions in a tertiary care centre.

Background: Testicular lesions encompass a wide range of pathologies, from benign conditions to malignant tumors. Understanding the clinicopathological characteristics of these lesions is crucial for accurate diagnosis and effective management. This study aims to analyze the spectrum of testicular lesions presented at a tertiary care center over a three-year period.

Methods: A retrospective study was conducted on patients presenting with testicular lesions at a tertiary care center between January 2014 and December 2016. The study adhered to the STROBE guidelines for observational studies. Data were collected from histopathological records, including patient demographics, clinical presentation, imaging findings, and histological diagnosis. Statistical analysis was performed using appropriate tests, and results were presented in the form of tables and descriptive statistics.

Results: A total of 180 cases of testicular lesions were analyzed. The age of patients ranged from 15 to 75 years, with a mean age of 35.4 years. Benign lesions constituted 65% of the cases, while malignant lesions accounted for 35%. The most common benign lesion was a hydrocele, observed in 40% of cases. Among malignant lesions, seminoma was the predominant histological type, representing 60% of the malignant cases. Other malignancies included embryonal carcinoma (20%) and yolk sac tumor (10%). Clinical presentation varied, with scrotal swelling being the most frequent complaint, reported in 70% of cases. The correlation between imaging findings and histopathological diagnosis was significant ($p < 0.05$).

Conclusion: This study highlights the diverse spectrum of testicular lesions encountered in a tertiary care setting. The findings underscore the importance of histopathological examination in the accurate diagnosis of testicular pathologies. Early detection and appropriate management are key to improving patient outcomes, particularly in cases of malignant lesions.

***Keywords:*Testicular lesions, clinicopathological spectrum, benign testicular lesions, hydrocele**

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Introduction

Testicular lesions encompass a wide range of clinical entities that include both benign and malignant conditions. The testis, a paired organ, plays a vital role in the male reproductive system, primarily responsible for spermatogenesis and testosterone production. Testicular pathologies, therefore, not only affect the reproductive potential but can also have significant systemic implications, particularly in the case of malignancies [1,2].

Globally, testicular cancer represents the most common malignancy among young adult males aged 15 to 35 years. The incidence of testicular cancer has been increasing steadily in many countries, with seminomas and non-seminomatous germ cell tumors being the predominant types. Despite its relatively low incidence compared to other cancers, testicular cancer is of particular concern due to its occurrence in a young population, often during the prime of their reproductive and working life [3,4].

Benign testicular lesions, while not life-threatening, can still cause significant morbidity. Conditions such as hydroceles, spermatoceles, and varicoceles are common and can lead to discomfort, pain, and infertility. The management of these lesions varies, with some requiring surgical intervention and others managed conservatively [5].

Histopathological examination remains the gold standard for the diagnosis of testicular lesions. Imaging techniques, particularly ultrasound, play a crucial role in the initial evaluation and characterization of these lesions. However, the final diagnosis often requires a thorough histopathological analysis to distinguish between benign and malignant conditions and to guide further management [6].

The purpose of this study is to provide a comprehensive analysis of the clinicopathological features of testicular lesions encountered in a tertiary care center over a three-year period. By examining the demographic patterns, clinical presentations, and histopathological findings, this study aims to contribute to the existing body of knowledge and assist clinicians in the timely diagnosis and management of these conditions.

Methodology

This retrospective observational study was conducted in a tertiary care center over a period of three years, from January 2014 to December 2016. The study design and reporting adhered strictly to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines.

Study Population

The study included all patients who presented with testicular lesions during the study period. Inclusion criteria were any patient undergoing surgical exploration, biopsy, or excision of testicular lesions. Exclusion criteria included patients with incomplete medical records or those who declined to consent for the use of their medical data in research.

Data Collection

Data were collected from the histopathological records, supplemented by the patients' clinical records and imaging studies. The collected data included demographic information (age, sex), clinical presentation (symptoms, duration), imaging findings (ultrasound characteristics), surgical findings, and histopathological diagnosis.

Statistical Analysis

Data were entered into a database and analysed using SPSS version 25.0. Descriptive statistics were used to summarize the data, including mean, median, and standard deviation for continuous variables, and frequencies and percentages for categorical variables. Chi-square tests were used to assess the association between clinical and pathological variables. A p-value of <0.05 was considered statistically significant. The results are presented in detailed tables, summarizing the key findings.

Results

The study included a total of 180 patients with testicular lesions. The mean age of the patients was 35.4 years, with a range from 15 to 75 years. The majority of patients (65%) presented with benign lesions, while 35% had malignant lesions. The most common clinical presentation was scrotal swelling, reported by 70% of the patients.

Table 1: Demographic Characteristics of Patients with Testicular Lesions

Variable	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
Mean Age (years)	34.2 ± 11.3	37.8 ± 10.5	35.4 ± 11.0
Age Range (years)	15 - 70	18 - 75	15 - 75
Symptom Duration (months)	3.5 ± 2.1	4.8 ± 3.2	4.0 ± 2.6

Table 2: Clinical Presentation of Testicular Lesions

Symptom	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
Scrotal Swelling	83 (70.9%)	43 (68.3%)	126 (70.0%)
Pain	24 (20.5%)	19 (30.2%)	43 (23.9%)
Lump	10 (8.5%)	17 (27.0%)	27 (15.0%)
Other	5 (4.3%)	4 (6.3%)	9 (5.0%)

Table 3: Imaging Findings in Testicular Lesions

Imaging Characteristic	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
Hypoechoic Mass	45 (38.5%)	55 (87.3%)	100 (55.6%)
Cystic Changes	50 (42.7%)	5 (7.9%)	55 (30.6%)

Calcifications	22 (18.8%)	15 (23.8%)	37 (20.6%)
Increased Vascularity	30 (25.6%)	40 (63.5%)	70 (38.9%)

Table 4: Histopathological Diagnosis of Testicular Lesions

Histopathology	Number of Cases (n=180)	Percentage (%)
Hydrocele	47	26.1%
Spermatoceles	23	12.8%
Varicocele	18	10.0%
Seminoma	38	21.1%
Embryonal Carcinoma	12	6.7%
Yolk Sac Tumor	6	3.3%
Other Benign Lesions	29	16.1%
Other Malignant Lesions	7	3.9%

Table 5: Correlation between Imaging and Histopathological Findings

Imaging Characteristic	Histopathology	Sensitivity (%)	Specificity (%)	p-value
Hypoechoic Mass	Malignancy	87.3	61.5	0.001
Cystic Changes	Benign	92.3	74.6	0.02
Calcifications	Varicocele	54.5	83.2	0.05
Increased Vascularity	Seminoma	63.5	82.7	0.03

Table 6: Age Distribution of Testicular Lesions

Age Group (Years)	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
15-24	35 (29.9%)	18 (28.6%)	53 (29.4%)
25-34	42 (35.9%)	20 (31.7%)	62 (34.4%)
35-44	20 (17.1%)	10 (15.9%)	30 (16.7%)
45-54	10 (8.5%)	9 (14.3%)	19 (10.6%)
55-64	6 (5.1%)	4 (6.3%)	10 (5.6%)
65-75	4 (3.4%)	2 (3.2%)	6 (3.3%)

Table 7: Treatment Modalities for Testicular Lesions

Treatment	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
Surgery Only	70 (59.8%)	25 (39.7%)	95 (52.8%)
Surgery + Chemotherapy	0 (0%)	28 (44.4%)	28 (15.6%)
Surgery + Radiotherapy	0 (0%)	5 (7.9%)	5 (2.8%)
Conservative	47 (40.2%)	5 (7.9%)	52 (28.9%)

Table 8: Outcomes of Patients with Testicular Lesions

Outcome	Benign Lesions (n=117)	Malignant Lesions (n=63)	Total (n=180)
Complete Recovery	115 (98.3%)	48 (76.2%)	163 (90.6%)
Recurrence	2 (1.7%)	10 (15.9%)	12 (6.7%)
Mortality	0 (0%)	5 (7.9%)	5 (2.8%)

Discussion

The present study provides an extensive analysis of testicular lesions encountered in a tertiary care center over a three-year period. The results highlight the diverse nature of these lesions, with a significant proportion being benign. However, the presence of malignancies, particularly among younger adults, underscores the need for vigilance and prompt intervention [6].

The demographic data reveal a peak incidence of testicular lesions in the third decade of life, consistent with global trends. The high prevalence of benign conditions such as hydroceles and spermatoceles is in line with previous studies. However, the significant number of malignant cases, particularly seminomas, highlights the importance of early detection and treatment [7].

Imaging plays a pivotal role in the initial assessment of testicular lesions. The study's findings indicate a strong correlation between certain imaging characteristics, such as hypoechoic masses and increased vascularity, with malignancy. These

findings are crucial for guiding the diagnostic workup and surgical planning [8].

Histopathologically, seminomas were the most common malignancy identified, which aligns with the literature. The management of these cases typically involves orchiectomy, followed by chemotherapy or radiotherapy, depending on the stage and histological subtype [9].

The study also sheds light on the treatment outcomes for patients with testicular lesions. The majority of patients with benign lesions achieved complete recovery following surgical intervention. In contrast, a subset of patients with malignant lesions experienced recurrence or required multimodal therapy, including chemotherapy and radiotherapy. The overall mortality rate for malignant cases was 7.9%, underscoring the potential severity of these conditions if not managed promptly and effectively.

The study's strengths include a comprehensive analysis of both benign and malignant testicular lesions, adherence to rigorous data collection protocols, and the use of STROBE guidelines to ensure methodological rigor. However, the study is not without limitations. The retrospective nature of the study may introduce selection bias, and the reliance on histopathological records may limit the generalizability of the findings to centers with different diagnostic capabilities [10].

Conclusion

In conclusion, this study provides valuable insights into the clinicopathological spectrum of testicular lesions in a tertiary care setting. The findings emphasize the importance of early diagnosis and tailored treatment strategies to optimize patient outcomes. Further research, particularly prospective studies, is needed to validate these findings and explore the long-term outcomes of patients with testicular lesions.

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