

Histopathological spectrum of testicular tumors

Hemavathi Reddy, Vijay D Dombale

Department of Pathology, Koppal Institute of Medical Sciences, Koppal, Karnataka, India

Correspondence to: Hemavathi Reddy, E-mail: hemareddy79@gmail.com

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ABSTRACT

Background: Testicular cancers are rare in most countries. However, in many western countries, its incidence has been increasing since the middle of the 20th century. These neoplasms span, an amazing gamut of anatomic type, contribute for 1-2% of all malignant tumors and most common malignancy in men in the 15-35 years of age group. A definite geographic and racial distribution is seen in testicular tumors. **Objective:** The purpose of the study was to analyze the incidence, morphological pattern, and distribution of testicular cancers. **Materials and Methods:** A retrospective study of 100 consecutive patients of all orchidectomy specimens and testicular biopsies was conducted over a period 24 months, between July 2012 to June 2014, at Department of Pathology, SNMC, Bagalkot, and peripheral centers. Histopathological examination was done after routine processing and staining with Hematoxylin and Eosin. **Results:** Testicular tumors were uncommon, comprising only 15% (15/100 cases) of all testicular lesions. Most of these tumors (50%) were seen between third and fifth decades. Germ cell tumors were the most common tumors (80%), among which seminomas was the most common, encountered six cases. 14% of the biopsies consisted of undescended testis, and none of them showed malignancy. **Conclusion:** Testicular tumors are uncommon in our population. As evident in other parts of the world, germ cell tumor was the common tumor found in this study as well. However, unlike in Western population, no tumor was seen in undescended testis. Study of testicular tumors is important for pathologists because grossly identifiable benign pathology may harbor in focus of malignancy.

KEY WORDS: Seminoma; Tumor Markers; Age Group; Undescended Testis; Geography


INTRODUCTION

Testicular cancers are rare in most countries. However, in many Western countries, its incidence has been increasing since the middle of the 20th century, accounts for 1-2% of all malignant tumors, incidence rate ranging from 1/100,000 in Asian and African/African American populations to 9.2/100,000 in Denmark.^[1] The testicular tumors (TTs), although relatively rare, constitute the 4th most common cause of death from neoplasia in a younger male. It is usually found

in age groups of men between 15 and 35 years which accounts for <1% of all malignancies in males.^[2] Its incidence has been increasing since the middle of the twentieth century in many Western countries with the potential exception of children ages 14 years or less, where little variation is observed.^[3-8]

Testicular carcinoma follows a reverse pattern to most cancers with decreasing incidence rate with increasing age. Cryptorchidism, Klinefelter syndrome, and strong family are the predisposing risk factors in the development of testicular germ cell tumors (GCTs).

Although the etiology of testicular cancers is not well understood, various factors such as cryptorchidism, trauma, infections, and genetic and endocrine factors appear to have a role in their development.^[9] A definite geographic and racial distribution is seen in TTs. The age distribution of testicular cancers is also distinct from other types of cancer.^[3]

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Objective

The present study is conducted to study the relative incidence of various testicular tumors among different age groups and histomorphological patterns of testicular tumors at SNMC, Bagalkot, and peripheral centers, Bagalkot, one of the tertiary care centers in North Karnataka.

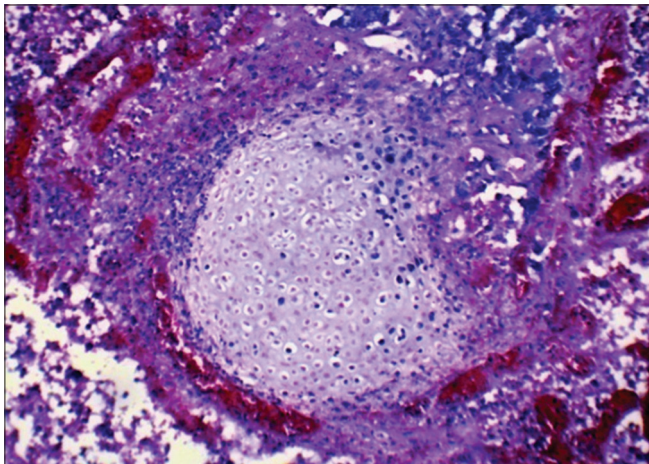


Figure 1: Microscopic picture of teratocarcinoma

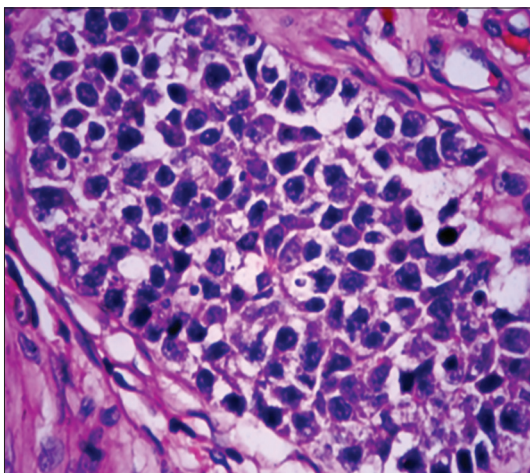


Figure 2: Microscopic picture of seminoma

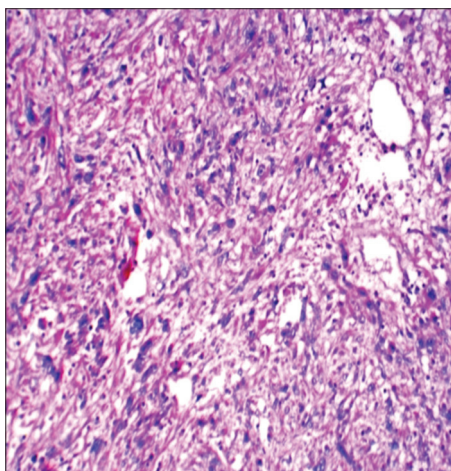


Figure 3: Microscopic picture of malignant fibrous histiocytoma

MATERIALS AND METHODS

The present study is the retrospective study of the gross and histopathological findings of testicular radical orchidectomy specimens and biopsies in 100 cases, received in the Department of Pathology, Shree Nijalingappa Medical College, a tertiary health-care center, Bagalkot, and peripheral centers, Bagalkot, over a period of 2 years, i.e., from July 2012 to June 2014. In this study, the orchidectomy specimens which had been sent for infertility had been excluded.

Due importance was paid to record a brief clinical history with age, registration number, biopsy number, presenting signs and symptoms. All patients' clinical details were retrieved from their case sheets which include routine hemogram, X-ray chest, ultrasound of the abdomen, when required serum marker assay for alphafetoprotein - human chorionic gonadotropin and computed tomography scan were done. Following findings were looked for during gross examination: right or left side, external surface, condition of the scrotal skin and 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, whenever received, along with the specimen were scrutinized for evidence of metastasis. Grossly multiple representative tissue sections of 3-4 mm thickness varying from 2 to 10 sections from tumor, part of normal testicular tissue, epididymis, and spermatic cord (surgical margin) were taken.

The gross specimens received were fixed in 10% neutral buffered formalin for overnight fixation. Next day morning, gross examination of fixed specimen is done, and the sections are taken from representative sites. These sections are further processed into automated tissue processor. After processing, sections are embedded in paraffin to make paraffin blocks. These blocks are then cut serially in 3-5 μ thickness using a rotatory microtome to prepare slides. Slides are then stained using routine Hematoxylin and Eosin stain and then mounted with DPX. Special stains are not carried out. These microscopic findings were then correlated with clinical diagnosis and came to a proper conclusion.

Histological features were studied in detail and correlated with other findings such as clinical, gross features, and tumor marker values mainly in GCTs.^[10]

RESULTS

There were 100 testicular biopsies received in the Department of Pathology at S N Medical College, a tertiary care center, Bagalkot, Karnataka, India, during July 2012 to June 2014. 95% of these testicular biopsies were of orchidectomy specimen and 5% were small biopsies; 14% biopsies consisted of undescended testes. Of the total, 15%

(15/100) cases were diagnosed as TTs as shown in Table 1. Age-wise distribution of the patients along with diagnosis is shown in Table 2. Figures 1-3 are depicting microscopic pictures of teratocarcinoma, seminoma and malignant fibrous histiocytoma.

DISCUSSION

Although the incidence of TTs is low, it is one of the most common malignancies occurring in young adults. As

described in the literature, TTs were found to be rare in this study too. Undescended testes comprised 14% (12 cases) of the total testicular biopsies received; however, none of these cases showed malignancy.

Most of the malignant cases were seen in the third and fifth decades, 11 cases (73.34%).

Testicular tumors are limited to three age groups: infancy, late adolescence to young adulthood (20-35 years), and 50 years and above.^[11]

Table 1: Different diagnosis made in the testicular specimens

Microscopy	Type of lesion		Total (n=100)	P
	Benign n=85 (%)	Malignant n=15 (%)		
TT	19 (22.1)	0 (0)	19 (19)	0.066+
TA	16 (19.0)	0 (0)	1 (16)	0.119
CNSI	16 (18.6)	0 (0)	16 (16)	0.117
UT	12 (14)	0 (0)	12 (12)	0.208
VH	7 (8.1)	0 (0)	7 (7)	0.589
Seminoma	0 (0)	6 (42.9)	6 (6)	<0.001**
TeratoCa	0 (0)	4 (28.6)	4 (4)	<0.001**
Orchitis	3 (3.5)	0 (0)	3 (3)	1.000
TB	3 (3.5)	0 (0)	3 (3)	1.000
NTT	2 (2.3)	0 (0)	2 (2)	1.000
Chylocele	1 (1.2)	0 (0)	1 (1)	1.000
EMB Ca	0 (0)	1 (7.1)	1 (1)	0.140
Hematocele and CNSI	1 (1.2)	0 (0)	1 (1)	1.000
MFH	0 (0)	1 (7.1)	1 (1)	0.140
MM GCT	0 (0)	1 (7.1)	1 (1)	0.140
MNS GCT	0 (0)	1 (7.1)	1 (1)	0.140
NFWAAL	1 (1.2)	0 (0)	1 (1)	1.000
Orchitis with TT	1 (1.2)	0 (0)	1 (1)	1.000
SL	1 (1.2)	0 (0)	1 (1)	1.000
Spermatocele	1 (1.2)	0 (0)	1 (1)	1.000
TaWSC	1 (1.2)	0 (0)	1 (1)	1.000
NHL	0 (0)	1 (7.1)	1 (1)	0.14

NHL: Non-Hodgkin lymphoma, MFH: Malignant fibrous histiocytoma, MNS GCT: Malignant nonseminomatous germ cell tumor, TT: Testicular tumors, TB: Tuberculosis, EMB Ca: Embryonal carcinoma, UT: Undecided testis, MM GCT: Malignant Mixed Germ Cell Tumour, NFWAAL: Neurofibroma with Atypical Lipoma, TaWSC: Testis abscess With Suppurative Changes

Table 2: Histopathological diagnosis along with age distribution

Age group	MM GCT	Seminoma	MNS GCT	TeratoCa	Embryonal	MFH	NHL	Total
10-20	1	1						2
21-30		2	1	2				5
31-40		2						2
41-50		1		2	1			4
51-60								0
61-70						1	1	2
>70								0
Total	1	6	1	4	1	1	1	15

NHL: Non-Hodgkin lymphoma, MFH: Malignant fibrous histiocytoma, MNS GCT: Malignant nonseminomatous germ cell tumor

According to the literature, the histological pattern and behavior of the tumor differ with age. One case of seminoma was seen at 11 years of age. In young adults, seminoma, embryonal carcinoma (EMB Ca), teratoma, and teratocarcinoma are common; however, seminoma is more common in the fourth decade whereas spermatocytic seminoma and lymphoma occur in the elderly. Seminomas have not been reported in infants while EMB Ca and teratoma are the most common tumors of infancy and childhood.

Of the total 15 malignant tumors in this study, 80% (12 cases) consisted of GCTs. According to Mostofi and Price,^[11] GCTs constitute more than 94% of TTs and other study also showed a similar percentage of GCTs.^[12]

Among the 12 cases of GCTs in this study, 2 (16.66%) were mixed GCTs. Seminoma comprises 35-71% of TTs. In this study, seminoma consisted of 40 (6 cases) of all TTs. A single case of EMB Ca (6.66%) was seen at 43 years of age.

In this study, one case of non-Hodgkin lymphoma (NHL) and spermatocytic seminoma was seen in elderly, five cases of pure seminoma occurred in the 3rd decade.

One case (7.1%) of NHL was encountered, which was large B-cell type seen in a 67-year-old patient. Fonseca et al.^[13] reported the median age of presentation of extranodal NHL to be 68 years. Primary testicular lymphoma accounts for approximately 1% of all lymphomas and is the most common testicular malignancy in men more than 60 years of age.^[14]

NHL is the most common neoplasm presenting as metastasis to the testis, comprising approximately 1% of TTs.^[11] It may occur at any age, ranging from 21 to 87 years with most of the cases presenting in the sixth and seventh decades.

Age group of patients studied in the third decade was 50% in the present study which was 39.7% of Qaiser et al.^[15] and 32% of Deotra et al.^[16] studies and which was almost nearer to our study.

Relative frequency of testicular tumors among cancers by different authors compared with present study and it was correlated.

Comparing of percentage incidence of testicular tumors in different studies was, like this, 80%.^[12] In our study also, it was 80% and which was correlating.

There were 85 (55.8%) patients with right-sided tumors and 67 (44.2%) patients with left-sided tumors.^[17] In this study, it was tumors - right-sided tumors were more common than (10 cases, 66.66%) left-sided tumors (5 cases, 33.33%), and this was the same in our study also.

According to Duncan and Munro,^[17] testicular swelling was the main complaint, 80%, and the present study also showed similar configuration.

HL occurring primarily in testis has not yet been reported so far in the literature. HL was not seen in this study as well. This variation in data may be due to the small number of cases included in this study.

The reported incidence of leukemic infiltration of testis varies from 8% to 25% in the literature, but in most studies, this figure is <10%.^[18-20] The testis represents a potential sanctuary site for tumor cells, especially in acute lymphoblastic leukemia (ALL).^[21] The incidence of testicular leukemia has increased with the improved survival of childhood ALL.^[22] In the present study, no single case of leukemic infiltration to testis seen, this is because of shorter duration of the study.

According to Staiman et al., the testis is a very rare location for malignant fibrous histiocytoma (MFH).^[23] One very rare case of MFH (6.66%) was seen at 67 years of age.

According to Mostofi and Price,^[11] stromal tumors consist of 3% of TTs. However, in this study, stromal tumors were not encountered. This could be due to the small number of cases and shorter duration of the study. Since, this study was limited by a small number of cases, follow-up study involving a larger study population is recommended.

CONCLUSION

We conclude that TTs are uncommon in our population. In our study, TTs showed a varied histomorphology. Germ cell tumors formed the bulk of TTs. Among the individual GCTs, seminomas were the most common followed by TeratoCa. The age of patients with TTs varied from 11 years to 80 years. Testicular tumors were the most common in the third and fifth decades of life. However, unlike in the Western population, malignancy developing in the undescended testes was rare.

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