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Morphological Pattern of Testicular Tumors

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Abstract

Objective: To find out the mode of presentation, age distribution and the prevalence of various histological subtypes of testicular tumors.
Method: All consecutive cases of testicular tumors diagnosed in the department of pathology, the Aga Khan University Hospital, Karachi, during the period of eight years (1991-98) were included in this study. Relevant clinical details such as age, clinical presentation and side of involvement of the testis were also recorded, where available.
Results: During the span of eight years (1991-98), 170 cases of testicular tumors were diagnosed at the Aga Khan University Hospital, Karachi. Most of the tumors were diagnosed in the third and fourth decade of life. Scrotal mass or swelling was the predominant mode of presentation. There was a slight predominance of right- sided testicular tumors. Germ cell tumors constituted 83.5% of all malignant testicular neoplasms. Amongst these seminoma was the most common (36.5%) tumor followed by mixed germ cell tumors (28.82%). Yolk-sac tumor was the commonest testicular neoplasm in children while lvmphoma was the predominant neoplasm in the malignancy in this series correlated with that reported elderly population.
Conclusion: The overall relative frequency of testicular in the international literature UPMA 50:110, 2000).

Introduction

Testicular cancer is the commonest malignancy in young males[1]. The worldwide incidence has been rising steadily and has more than doubled over the past few decades[2]. Approximately 95% of malignant tumors arising in the testes are germ cell tumors[3]. Although most of these behave aggressively, they are among the most curable cancers in humans[4]. More than 90% of patients with newly diagnosed cancer are cured[5,6]. Mortality due to these lesions has decreased because of recent advances in their management with combination chemotherapy and surgery[7]. Early and accurate diagnosis is important for successful management of testicular tumors as a delay in diagnosis correlates with higher stage at the presentation for treatment[5,6]. This study looks at the prevalence of various histological sub-types of testicular tumors, presentation and age distribution in our population.

Materials and Methods

This study included all (n=170) cases of testicular tumors diagnosed in this hospital during a period of eight years (199 1-98). The WHO classification scheme was used for histologic typing[8]. Relevant clinical details such as age, clinical presentation and side of involvement of the testis, were analyzed along-with histological diagnoses. Ten percent buffered formalin was used as fixative for specimens. The gross examination of the specimens was performed and adequate representative sections were obtained according to the guidelines provided by Rosai[9].
Paraffin-embedded sections were stained routinely with Haematoxylin and Eosin. PAS (Periodic Acid Schiff) and reticulin stains were performed where necessary. Immunohistochemical staining was also done where indicated. The immunomarkers included Cytokeratin, Human Chorionic Gonadotrophin

(HCG), Placental Alkaline Phosphatase (PLAP), Alpha Feto Protein (AFP), Leukocyte Common Antigen (LCA), 1.-26 (Pan-B) and UCHL-l (Pan-T). All of these monoclonal antibodies are commercially available and were obtained from DAKO. Denmark.

Results

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 (Table 1)

Table 1. Clinical Presentation of the Cases (n=143*).

Clinical Presentation	Percentage
Mass or Swelling	94.4
Cryptorchidism	8.4
Gynecomastia	1.4
Trauma	1.4

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. Histologically (Table 2),

Table 2. Histological types and mean age in 170 patients with testicular tumors.

Histological Diagnoses	No.	% of Total	Age (years)	
			Mean	Median
Germ cell tumors				
Seminoma	62	36.5	34.3	32.0
Spermatocytic seminoma	2	1.18	55.0	
Yolk sac tumor	13	7.65	14.5	4.0
Teratoma	12	7.00	30.0	25.5
Embryonal carcinoma	4	2.35		
Mixed germ cell tumor	49	28.82	26.2	25.0
Subtotal	142	83.5	29.3	28.0
Non-Germ cell tumors				
Lymphoma	14	8.23	52.5	60.0
Leukemia	6	3.53	9.6	9.0
Sertoli cell tumor	3	1.76	33.0	
Adenocarcinoma of rete testis	2	1.18	46.5	
Gonadal stromal tumor	1	0.6		
Malignant undifferentiated epithelial tumor	1	0.6		
Malignant mesothelioma	1	0.6		
Subtotal	28	16.5	38.2	45.0
Total	170	100	30.9	29.0

83.5% testicular tumors 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. Approximately one third (34.5%) of germ cell malignancies 2 patients presented with testicular mass alongwith gynecomastia, while in two patients testicular mass was noted and there was history of

testicular trauma as well.

were of mixed type

he age distribution of five leading tumors is shown in Table 3.

Table 3. Age distribution of major testicular tumors.

Age Group (years)	Seminoma	MGCT*	Lymphoma	YST**	Teratoma	Total
0-9	0	1	2	7	0	10
10-19	0	10	0	0	1	11
20-29	26	24	0	3	7	60
30-39	22	10	0	3	3	38
40-49	9	3	3	0	0	15
50-59	3	1	2	0	0	6
60+	2	0	7	0	1	10

*Mixed Germ Cell Tumor
**Yolk Sac Tumor

The age related data reveals that seminoma was the most common lesion encountered, with 42% of the patients between 20 to 29 years of age. There was a slight predominance (55.1%) of right-sided tumors. Bilateral seminoma was seen in one case only.

Mixed germ cell tumor was the second common testicular tumor in frequency, accounting for 28.82% of all cases. Majority of the patients presented between the ages of 20 to 29 years. A broad spectrum of histopathological combinations was encountered in this subgroup such as years, with a mean of 26.2 years.

Lymphoma constituted the third major category in this series. Half of the patients were aged 60 years or above. All cases were of B-cell phenotype as determined by LCA and L-26 (Pan-B) irnmunostaining embiyona! carcinoma and teratoma, embryonal carcinoma and yolk sac tumor, enibryonal carcinoma, yolk-sac tumor and teratoma. The ages of the patients ranged from 3 to 50

Yolk sac tumor ranked fourth in this study. 53.8% of the patients were below 4 years of age, making it the commonest (70%) testicular tumor in pediatric population.

Teratoma was encountered in 12 patients. This included 10 patients with immature teratoma and 2 patients with mature teratoma exhibiting focal malignant transformation.

Discussion

In Western countries cancer of the testis is the most common solid malignancy in men age 15-35 years, being responsible for approximately 10% of all cancer related deaths in this age group[3,10,11]. Its incidence in United States is approximately 6 per 100,000[3]. One study has reported that testicular tumors comprise 3.8% of all malignancies in Pakistan[12]. In Pakistan central tumor registry is non-existent making it difficult to know the true prevalence of tumors in our country. There has been a single study looking at the frequency and histological types of testicular tumors in Pakistan[13]. However data presented was mostly from northern part of Pakistan and it comprised of relatively smaller number of patients. This could be the reason for differences in the relative distribution of some of the testicular

tumors when compared wit the present study (Table 4).

Table 4. Comparison with local data.

Tumor Type	AFIP (13) n=52	AKUH n=170
Seminoma	38.4%	36.5%
Yolk sac tumor	19.2%	7.65%
Teratoma	19.2%	7.0%
Embryonal carcinoma	1.9%	2.35%
Mixed germ cell tumor	3.8%	28.8%
Lymphoma	5.7%	8.23%

Testis has a complex histologic composition, testicular tumors as a consequence, may differentiate along a multitude of pathways[14]. In a large epidemiologic survey of about 34,000 testicular tumors in nine northern Europian states, where these tumors are reported to have a higher incidence, it was demonstrated that the highest age-related incidences were to be found in two age groups, 25-29 years and 30-34 years[15]. Another study from the neighboring state of India revealed similar age incidence[16]. In the present study (Table 2). the mean age at presentation for mixed germ cell tumors was 26.2 years and for seminoma, 34.3 years. This finding is consistent with the reported in international literature.
In general testicular tumors present as a painless mass or swelling[17]. Majority of the patients in our study also presented with testicular mass or swelling (Table 1). Cryptorchildism is reported to be a predisposing factor in the development of germ cell tumors in testes. Literature review reveals that a cryptorchid testis has a fivefold to tenfold increased risk of developing a malignant tumor as compared with the normally placed testis[18]. Conversely, approximately 11% of testicular tumors are associated with cryptorchidism, seminoma being the commonest[19,20]. In the patients with unilateral cryptorch idism, the contralateral, normally descended testis may also undergo malignant transformation[3]. In our study. crvptorchidism was seen in 8.4% of cases, half of these were seminomas.
Gynecomastia is rare in the patients with testicular cancer and is generally considered an unfavorable prognostic factor[21]. In our series. only two patients presented with gynecomastia.
Lymphornas comprise only 5% of all testicular neoplasms and constitute the most corn mon testicular malignancy in elderly population[3]. The diffuse large cell variety is the predominant histologic type. These tumors have a grave prognosis[22]. In this study l\\rnphoma was the most common non-germ cell tumor, accounting for 8.23% of all testicular neoplasms.
We concluded that the morphologic pattern of testicular tumors in our series is sim lIar to that reported in the international literature.

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