

# Histopathological Trends of Testicular Neoplasm: An Experience over a Decade in a Tertiary Care Centre in the Malwa Belt of Central India

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## ABSTRACT

**Introduction:** Testicular and para-testicular neoplasm are rare type of tumours affecting adolescents and young adults, reflected by the paucity of published data in India.

**Aim:** This study was undertaken to estimate the epidemiological characteristics and histological types and subtypes of testicular neoplasm according to the WHO classification in our patient group. Identification of histopathological pattern of testicular tumour is immensely important for improved management protocols.

**Materials and Methods:** This was a retrospective study done over a period of ten years from 2004 to 2014 in a tertiary care centre. All relevant clinical data including patient's age, laterality, history of risk factors and serum tumour markers were collected from records. Histopathological slides were retrieved and reviewed for tumour and its subtype and classified according to WHO classification (2004).

**Results:** A total of 37 cases of testicular and paratesticular neoplasm were encountered in our study with a mean age of 38.1 years. Right testis was affected in 70.3% of cases. The most common clinical presentation was scrotal swelling with heaviness. Germ cell tumour was the most common type accounting for 77.1% followed by lymphomas (17.1%). Germ cell tumours were categorized into seminomatous (48.2%) and non-seminomatous tumours (51.8%). The most common subtype of non-seminomatous tumours was mixed germ cell tumour accounting for 85.8%.

**Conclusion:** The incidence of testicular neoplasm among general population in Asian countries is low, as reflected in the very few studies that have been performed and published in literature. Epidemiological and histomorphological spectrum of our study was comparable to most of the countries except for some African and Western countries.

**Keywords:** Carcinoma testis, Germ cell tumor, Seminoma

## INTRODUCTION

Testicular cancers comprise 1% of all the male cancers worldwide [1]. In developed countries, testicular neoplasms have been noted as most common solid tumour between the 2<sup>nd</sup> and 4<sup>th</sup> decade of life [2,3]. There are various risk factors for development of testicular cancers which include: a family history of testicular tumour in first degree relatives, infertility, cryptorchidism, Klinefelter's syndrome and some other uncommon factors like trauma, hormones, etc [4]. Although testicular cancer can be derived from any cell type found in the testicles, more than 95% of testicular cancers arise from germ cells. The hypothesis behind the germ cell tumour is that the disease process begins in foetal life and comprises of abnormal proliferation of primordial germ cells [5,6].

In 2004, WHO has classified testicular and paratesticular neoplasms into various subgroups [7] and same were incorporated in present study. After an exhaustive literature search with keywords (testicular neoplasm, Germ cell tumour, Central India) revealed minimal number of studies from the Indian subcontinent and none from Central India region.

## AIM

Hence, the purpose of our study was to report the trends and distributions of types and subtypes of testicular neoplasm in a Central India (Malwa region) population, comprising of all the male patients admitted for evaluation of testicular masses over the period of 10 years from December 2004 to January 2014.

## MATERIALS AND METHODS

This was a retrospective study of all testicular malignancies diagnosed in the Department of Pathology of tertiary care centre

from 2004 to 2014. The histopathological slides were retrieved and reviewed. All clinically relevant data including patients age, laterality, history of risk factors and serum tumour markers was collected from the records. The tumours were classified according to WHO classification (2004) [7].

## RESULTS

Based on our archives, there were 37 histopathologically confirmed cases of testicular and paratesticular neoplasms over a study period of ten years. The mean age was 38.1 years with the age range of 1 to 80 years. More than 59% of cases occurred in 3<sup>rd</sup> and 4<sup>th</sup> decade [Table/Fig-1]. Twenty six (70.3%) of the tumours were on the right side and 11 (29.7%) were on left side. There was no bilateral involvement in our study.

Scrotal swelling and heaviness was recorded in 29 cases and history of pain in 7 cases. A history of cryptorchidism was noted in 3 cases and family history of testicular neoplasm in 2 cases. Testicular atrophy was noted in 1 case. Preoperative assay of tumour marker showed elevated  $\alpha$ -fetoprotein and  $\beta$ -human chorionic gonadotrophin levels in 10 (27.0%) and 6 cases (16.2%) respectively.

Out of total 37 cases, 35 (94.6%) cases were testicular and 2 (5.4%) were paratesticular neoplasm. Out of 35 testicular neoplasm, 27 cases (77.1%) were germ cell tumours, 6 cases (17.1%) were lymphomas, 1 case (2.9%) of mixed germ cell/sex cord stromal tumour and cavernous hemangioma each. Two cases of paratesticular neoplasm were reported as sarcomas [Table/Fig-2].

Of the germ cell tumours, 13 cases (48.2%) were seminomas and 14 cases (51.8%) were non-seminomas. The most frequent subtype of non-seminomatous tumour was mixed germ cell

Age group(years)	Frequency	Percentage
0-10	01	2.7%
11-20	03	8.1%
21-30	11	29.7%
31-40	11	29.7%
41-50	02	5.4%
51-60	03	8.1%
61-70	04	10.9%
71-80	02	5.4%

**[Table/Fig-1]:** Age wise distribution of testicular neoplasm (n=37).

S.No	Histological Type	No of cases	Percentage
1	Germ cell tumours	27	73.0%
2	Lymphoma	06	16.2%
3	Sarcoma	02	5.4%
4	Others *	02	5.4%

**[Table/Fig-2]:** Main histological types of testicular and paratesticular tumours (n=37)

\*Mixed germ cell/Sex cord stromal tumour- 1, Cavernous hemagioma-1.

S.No	Histological types and subtypes	No of cases	Percentage
1	Seminomatous	13	48.2%
2	Non-Seminomatous	14	51.8%
3	Embryonal carcinoma	00	00
4	Yolk sac tumour	01	7.1%
5	Teratoma	01	7.1%
6	Mixed germ cell tumour	12	85.8%

**[Table/Fig-3]:** Histological subtypes of germ cell tumour (n=27).

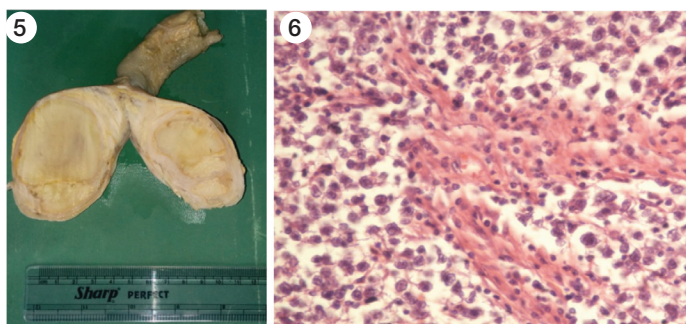
tumours accounting for 85.8% [Table/Fig-3]. The mean age for germ cell tumour was 32.4 years, with seminoma 37.9 years and for non-seminomatous tumour 27.5 years. Patient diagnosed with lymphomas had a mean age of 61.3 years.

## DISCUSSION

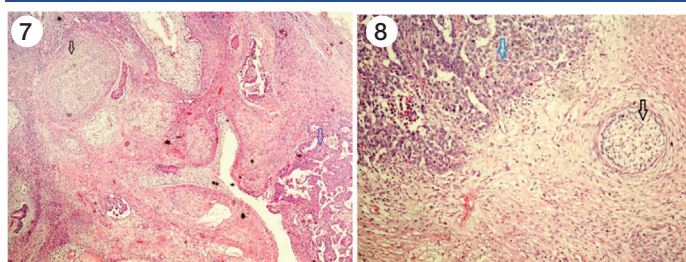
There are less number of studies published in the past couple of years on testicular neoplasm in Asian countries, among them few were pertaining from India [8-10]. Testicular and paratesticular neoplasm are still relatively less as compared to other cancers, as it constitute 10.5% of all male reproductive cancers in India [11]. In present study, we found only 37 cases during ten year period with an average of 3.7 cases per year. There is a marked variation in the incidence of testicular neoplasm worldwide as western countries [12,13] showing a higher rate as compared to African [14,15] and Asian countries [4,10,16,17] [Table/Fig-4]. The high incidence in western countries is due to genetic factors, cryptorchidism, oestrogen rich diet and industrialization [4,18]. However, in present study lower incidence was observed due to lack of major risk factors like cryptorchidism as it accounted for 8.6% in our patient group. This is comparable with the finding of other workers, who found previous history of cryptorchidism in

S.No	Study (year)	Country	Average no of cases per year
1)	Horwich et al., (2013) [12]	England	64.9
2)	Walschaerts et al., (2008) [13]	France	53.2
3)	Chalya PL et al., (2014) [14]	Tanzania	5.6
4)	Salako AA et al., (2010) [15]	South Western Nigeria	1.5
5)	Deotra A et al., (1994) [10]	India (Rajasthan)	5.5
6)	Mushtaq S et al., (2007) [16]	Pakistan	21.4
7)	Present study (2016)	Central India (Malwa belt)	3.7

**[Table/Fig-4]:** Comparative study of average number of Testicular neoplasm per year in various countries.

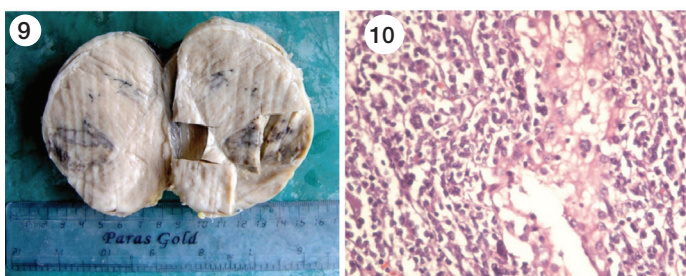


**[Table/Fig-5]:** Gross photograph of seminoma showing a well defined, yellow homogenous testicular mass. **[Table/Fig-6]:** High power view showing monotonous tumour cells divided by thin fibrovascular septae (H & E- 400x).



**[Table/Fig-7]:** Scanner view of mixed germ cell tumour showing teratomatous (black arrow) and embryonal carcinomatous (blue arrow) component. (H & E- 40x).

**[Table/Fig-8]:** Low power view of mixed germ cell tumour showing teratomatous (black arrow) and embryonal carcinomatous (blue arrow) component. (H & E- 100x).



**[Table/Fig-9]:** Gross photograph of lymphoma showing a well defined, tan homogenous testicular mass. **[Table/Fig-10]:** High power view of lymphoma showing tumour cells with prominent nucleoli in few, infiltrating the interstitium and few seminiferous tubules. (H & E- 400x).

10% of all testicular cancer patients, making it the single most important risk factor associated with testicular cancer [14].

In present study, peak age incidence was seen in 3<sup>rd</sup> and 4<sup>th</sup> decade of life which was in accordance with reports from African and European series [4,19]. Testicular neoplasm were more common on right side in present study, accounting for 70.3% which was similar to other studies [20,21]. Painless scrotal swelling was the most common clinical presentation in our patients irrespective of the histological types which was in accordance with other workers report [22].

Testicular neoplasm of germ cell origin, constitute more than 95% of these tumours and it is the most common malignancy in men aged between 18-35 years [23]. We found 27 cases (73%) of germ cell testicular tumours with a mean age of 32.4 years. Out of these germ cell tumours, 13 cases (48.2%) were of seminomas with mean age of 37.9 years and 14 cases (51.8%) of non-seminomatous tumours with mean age of 27.5 years. This confirms the known younger age of patients with non-seminomatous tumours compared to seminomatous subtype [16,24,25]. Gross examination of seminomas, showed a well defined, creamish yellow homogenous firm mass, ranging from 4 to 10 cm. Microscopic examination revealed monotonous cell population divided into lobules by thin fibrovascular stroma [Table/Fig-5,6].

Among the non-seminomatous tumours, mixed germ cell tumour was the most frequent subgroup accounting for 85.8% followed



by yolk sac tumour and teratoma. The predominance of mixed germ cell tumours among non-seminomatous tumours have also been reported in Turkey [26]. However, in another study from Ilorin, Nigeria yolk sac tumour was the most common subtype [27]. The most common combination in our study was teratocarcinoma (teratocarcinoma with embryonal carcinoma) accounting for 6/12 cases (50%) followed by 4/12 cases (33.3%) of teratocarcinoma with yolk sac tumour and 2/12 cases (16.7%) of seminoma with yolk sac tumour. Our findings were in accordance with previous study in which teratocarcinoma was commonest subtype [10]. Gross examination of most of the teratocarcinomas revealed variegated appearance ranging from 5.5 to 11 cm in diameter. Microscopic examination revealed mostly teratomatous and embryonal carcinomatous elements [Table/Fig-7,8].

Primary malignant lymphomas of testis are rare and constitute about 5% of all testicular neoplasm [28]. In present study, other than germ cell tumour, lymphomas were the next most common tumour constituting about 16.2% with mean age of 61.3 years. These findings were in accordance with the series from Pakistan which showed Non Hodgkin's lymphoma were quite frequent, which was reason for second peak in over 60 year's age group [16,29]. Gross examination of lymphomas revealed mostly fleshy, cream tan, homogenous mass ranging from 7 to 10 cm in diameter. Microscopic examination showed round to oval tumour cells with visible nucleoli in few, predominantly infiltrating the interstitium, with involvement of few seminiferous tubules [Table/Fig-9,10].

Two cases of paratesticular neoplasm were reported in present study, with age of 35 and 80 years respectively. Both cases were histologically proved as leiomyosarcomas. Leiomyosarcoma is relatively common sarcoma of the paratesticular area, especially in adults with age range from 15 to 84 years [30,31]. In contrast to our study, rhabdomyosarcomas were most common variety of paratesticular neoplasm in a study from south western Nigeria [15].

## CONCLUSION

The incidence of testicular neoplasm still remains low in India which is reflected by the paucity of studies in published literature. Germ cell tumours accounted for highest percentage of cases with a commonest subtype of seminoma followed by mixed germ cell tumour. Only one case was reported as benign in present study, which highlights that any testicular swelling should be evaluated thoroughly with clinicopathological correlation to rule out malignancy.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Dec 07, 2015**  
Date of Peer Review: **Mar 08, 2016**  
Date of Acceptance: **Apr 09, 2016**  
Date of Publishing: **Jun 01, 2016**