Testicular Pathology: A Four Years Study at BP Koirala Memorial Cancer Hospital

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ARTICLE INFO
Article History
Submitted: 25 May , 2023
Accepted: 15 June, 2023
Published: 8 August, 2023

Source of support: None
Conflict of Interest: None

ABSTRACT

Introduction: Cancer of testes are relatively rare cancer accounting around 1 % cancer in male. The commonest presentation of testicular tumor is a nodule or painless swelling of one or both testicle.

Methods: Retrospective study was performed in the Department of Pathology, BP Koirala Memorial Cancer Hospital from January 2016 to December 2019 (4 years). Tumour typing and subtyping was done according to WHO classification. The objective of the study was to assess clinico-pathological spectrum of testicular disease and to evaluate histopathological diagnosis and subtypes in Prime Oncology Centre of Nepal. All data were entered in MS excel and descriptive analysis was done.

Results: A total of 69 cases of orchidectomy with age ranges from 2 years to 84 years were included. 83% of cases are neoplastic and most common was Germ cell tumor. In our study, testicular tumors showed a diverse histopathology features and Germ cell tumors were the dominating ones. Among the individual germ cell tumors, Seminoma were the most common followed by Mixed GCT. Testicular tumors were the most common in third and fourth decades of life.

Conclusion: Most common neoplasm in testes was germ cell tumor and of which Seminoma was most frequent.Histopathological examination is necessary to execute an accurate diagnosis of testicular swellings and further treatment.

Keywords : GCT; Orchidectomy; Testis.

INTRODUCTION

Cancer of testes are relatively rare cancer accounting around 1 % cancer in males. However it is important in field of oncology as it represents a highly curable neoplasm & the incidence is focused on young patients at their peak of productivity as these are most commonly encountered in 15-35 years age group.[1,2,3] The commonest presentation of testicular tumor is a nodule or painless swelling of one or both testicle. Other clinical presentation include undescended testis or cryptorchidism, epididymo-orchitis, hydrocele, dull ache or dragging sensation in the genital region, and rarely infertility.[3,4] Risk factors for the development of testicular tumours include: a history of cryptorchidism, Klinefelter's syndrome, a familial history of testicular tumour among first-degree relatives, the presence of a contralateral tumour, and infertility.[5] Despite new techniques in imaging and tumour marker assay, pathologist plays a vital role in accurate classification, subtyping and staging of tumors and identifying prognostic parameters.

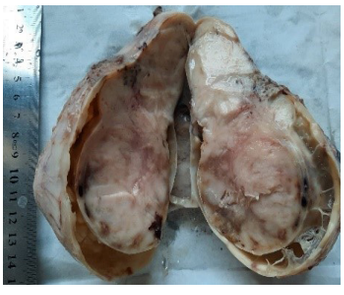
METHODS

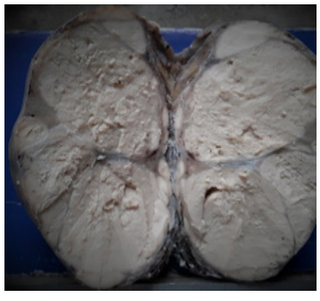
A Retrospective study was performed in the Department of Pathology, BP Koirala Memorial Cancer Hospital from January 2016 to December 2019 (4 years). This study was approved by the Institutional Review Board, BPKMCH (Reg. No. 2377/076/077). All cases of testicular pathology, histopathological reports and required clinical details was obtained from records maintained in the Department of Pathology. Tumour typing and subtyping was done

according to WHO classification. The objective of the study was to assess clinico-pathological spectrum of testicular disease and to evaluate histopathological diagnosis and subtypes in Prime Oncology Centre of Nepal. All orchidectomy specimen were included except those with incomplete infor-mation. Strict confidentiality of patient information was maintained while handling the data set. All data were entered in MS excel and descriptive analysis was done.

RESULTS

A total of 69 cases of orchidectomy specimen included in the study from 2016 Jan -2019 Dec. Patient age ranges from 2 years to 84 years with average age of hospital presentation being 39 years, however after excluding non-neoplastic pathology average was 29 years.





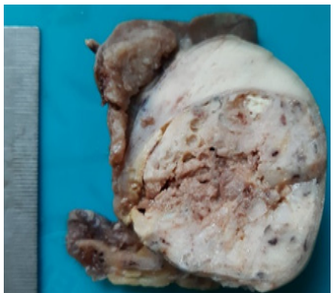


Figure 1
A: Non Hodgkin Lymphoma
B: Seminoma
C: Mixed Germ Cell Tumor

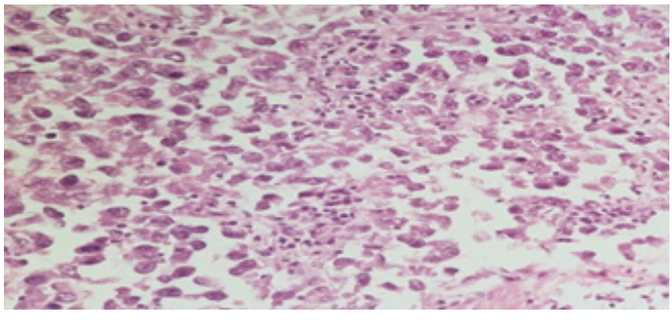


Figure 2 : Dyscohesive large cells with inter-spersed lymphocytes(H&E, 40x)

Out of 69 cases 28 were right, 34 left and remaining 7 were bilateral orchidectomy specimen. Average size of testis in hospital presentation after excluding bilateral orchidectomy for Carcinoma prostate and no residual tumor secondary to Neo-adjuvant chemotherapy, was 7.54 cm.

Majority of case complaints swelling of testes (88%), cryptorchidism 2.8%, trauma 2%, pain/discomfort 4% and 3.2 % were of non-testicular pathology i.e Prostate Adenocarcinoma. In Mixed Germ Cell Tumor component present in descending orders are seminoma, yolk sac, embryonal and choriocarcinoma.

Table 1: Frequency and median value of prescribed tumor markers

Histopathologic Diagnosis	Percentage (%)	Mean Age (years)
Germ Cell Tumor	37	
Seminoma(Fig.2)	18	33.5
Non Seminomatous tumor	19	
Mixed GCT	9	34.8
Yolk Sac Tumor, Pre-pubertal	3	16
Mature Teratoma-Post pubertal	4	26
Embryonal Carcinoma	3	24
Sex Cord Stromal Tumor	1	28
Granulosa Cell Tumor	1	28
Non Hodgkins Lymphoma	7	42
Rhabdomyosarcoma	2	21.5
Mets SqCC	1	52
Adenomatoid Tumor	1	47
Benign Cystic Lesion	1	57
Borderline mucinous tumor	1	49
Cholesterol Granuloma	3	74
Tuberculous Orchitis	3	41.5
Chronic Non Specific Orchitis	3	65.3
No residual tumor	7	29.8
Atrophic Testes	2	78
Total	69	39

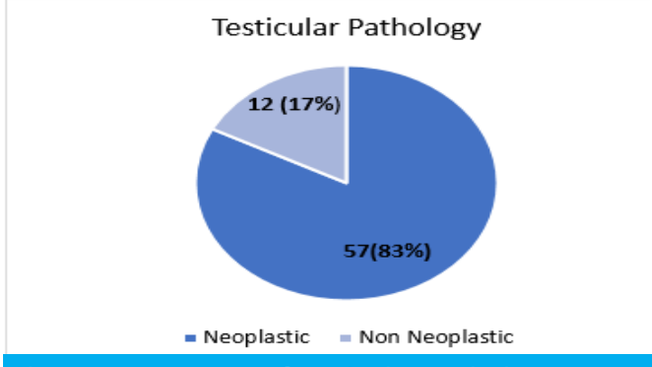


Chart 1: Frequency of testicular pathology

Table 2: Age distribution of testicular tumours

Age group (years)	Seminoma	YST	Emb. Carcinoma	Teratoma-post pubertal	Mixed-GCT	Granulosa Cell Tumor	NHL	RMS	Borderline mucinous Tumor
0-10		1							
11-20			1	2			1	1	
21-30	6	2	1	1	5	1		1	
31-40	7		1	1	1		2		
41-50	5				3				1
51-60							2		
61-70							1		
71-80									
81-90							1		

Table 3: Staging of germ cell tumor testes

Germ Cell Tumor	Staging	Number of cases
Seminoma	IA	15
	II	2
	III	1
Non Seminomatous Tumor	IA	11
	IB	8

DISCUSSION

Out of total surgically managed cases in BPKMCH, around 1.1% cases are of testicular pathology.[6,7,8] Upon literature review it is found that less number of studies have been published in the past years on testicular neoplasm in South East Asian countries. Few research studies and case reports were from Nepal viz; Karki S. et al.[9] 2012 and 70 cases (both incisional and orchidectomy specimen) is mentioned in their work, Ghartimagar D. et al.[10] (2014) related to case report in bilateral seminoma. Likewise, Shrestha B. et al.[11] (2009) published case report in germ cell tumor in cryptorchidism. Shrestha S. et al.[12] (2019), submitted their research work with case report in Leydig cell tumor.

Testicular malignancy is the most common non-hematologic malignancy seen in men between 15-49 years of age.[13] Majority of case complaints swelling of testes which is similar to the study done by Nwafor C C. et al, Gill M S. et al, Sheeja S. et al, Albasri M A. et al, Patel M B. et al.[14-18] The average age of presentation of neoplastic testes was 29 years and 39 years in non-neoplastic pathology, which is in coherence with the published research work done in past.[14-18]

All those cases with no residual tumor were the result of neo-adjuvant chemotherapy after diagnostic incisional biopsy and completion radical orchidectomy that have gone simple orchidectomy outside. Seldom patients may present with metastatic GCT with no apparent testicular mass. However, some of these cases are truly extra-gonadal (typically retroperitoneal or mediastinal) in origin. Rarely sometimes scarring fibrosis is present in the testis, consistent with spontaneous regression of the GCT. Still, the reason behind the regression of testicular neoplasm and non-spreading of metastatic sites is not clearly understood.[19]

Around 90% of malignant testicular tumours are found to be GCTs. WHO's 2016 classification considers GCTs in terms of their derivation from, or lack of relation to GCNIS.[20] Tumours derived from GCNIS comprises pure seminoma and also non-seminomatous (NSGCT) tumours like embryonal carcinoma, Yolk Sac Tumour (YST) of postpubertal type, teratoma of postpubertal type (including teratoma with somatic type malignancy), trophoblastic tumours such as choriocarcinoma, mixed NSGCTs and regressed GCTs. Furthermore, GCTs derived from GCNIS, regardless of their morphologic type, are usually associated with isochromosome 12p (i12p).[19]

In this study, there are only three cases of GCTs not related to Germ Cell Neoplasia In situ (GCNIS), which are Yolk Sac tumor, Prepubertal type. Rest of the GCTs are GCNIS related. Out of all GCTs, 70% of the cases were found to be at Stage I. Testicular tumours that are not associated with GCNIS are relatively few in number and include spermatocytic tumour, teratomas of prepubertal type and YST of prepubertal type.[21]

According to latest research works, it can be understood that Teratomas are considered as being of prepubertal or postpubertal type.[20,22] Dermoid and epidermoid cysts and well-differentiated neuroendocrine tumours

(or monodermal teratomas) are included in Prepubertal teratomas. Prepubertal teratomas, in contrast with their postpubertal counterparts, are associated with a normal genotype and adjacent normal prepubertal testicular parenchyma without GCNIS. They have mixed histology, behave in a benign fashion, its occurrence is very rare in men over 20 years of age.With the cases of adults beyond the age of 20 years, while encountering dermoid/epidermoid cysts, pathologists can use the certain criteria to correctly classify these cases, viz. an absence of GCNIS, adjacent parenchyma teratomas with respect to mature or immature elements. In contrast, some other research works have found the cases with an overgrowth of frankly malignant elements (epithelial or mesenchymal) that are considered diagnostic of teratoma with somatic-type malignancy.[20-22]

It is now established that Adult Granulosa Cell Tumor (AGCT) of the testis represents a very rare testicular neoplasm and the first documentation of an AGCT is credited to Laskowski in 1952.[24] In this study, a single case of Adult Granulosa Cell Tumor was observed, Immunohistochemical workup expressed positive staining of Inhibin, Vimentin, and Calretinin and negative staining for Oct- 4.

Out of 7 NHL cases, one case was of 11 years who was a known case of T cell type- ALL presented with testicular mass and rest of the six cases where B cell type Lymphoma. Average age of presentation, taken into consideration in this study, is more than 40 years old. Primary testicular NHL which is a rare disease accounts for 1% of all non-Hodgkin's lymphoma, 2% of all extranodal lymphomas and 5% of all testicular neoplasms.[25]

Moreover, in this investigational study, nine cases of Mixed GCTs, which comprises 13% of total cases, were observed which mostly comprised in combination of seminoma, yolk sac, embryonal and choriocarcinoma. The quantity of the component were in descending order mentioned earlier which is similar to other studies.[5,9,14.]

Three cases of Tuberculous Orchitis were found and was the mimicker of the neoplastic conditions. There were two cases of atrophic testes which were excised in diagnosed case of Prostatic Adenocarcinoma.

CONCLUSION

Testicular tumors are not so common in our population. In our study, testicular tumors showed a diverse histopathology features and Germ cell tumors are dominating ones. Among the individual germ cell tumors, Seminoma were the most common followed by Mixed GCT. The age of patients with testicular tumors varied from 2 years to 84 years. Testicular tumors were the most common in third and fourth decades of life. Histopathological examination is necessary to execute an accurate diagnosis of testicular swellings and further treatment.

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