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Morphological Study of Orchidectomy Specimens: An Experience at Tertiary Care

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Abstract

Introduction: Surgical removal of testis is indicated in testicular tumors, male breast carcinoma, prostate cancer as well as in many non-neoplastic lesions like-undescended testis, torsion, epididymo-orchitis, hematocele and testicular atrophy. Testicular atrophy secondary to testicular injury and infections are common next to cryptorchidism. Testicular tumors comprise only 1% of all cancers in men. *Aims and Objectives:* Study of histomorphological spectrum of lesions in orchidectomy specimens and to determine the frequency of various testicular tumors. *Materials and Methods:* This is a retrospective study of orchidectomy specimens received from January 2009 toJanuary 2013. The specimens were grossly examined, fixed in 10% neutral buffered formalin. All H & E sections were reviewed. *Results*: Out of the 63 orchidectomy specimens received, 46 (73.01%) were non-neoplastic while 17 (26.98%) were neoplastic lesions. Among the non-neoplastic lesions, chronic epididymo-orchitis was the commonest, followed by atrophic testis, organized hydrocele, acute epididymo-orchitis, pyocele and others. Whereas, neoplastic lesions ranged from seminoma being the commonest followed by mixed germ cell tumors, lymphoma, pure germ cell tumors, spermatocytic seminoma and metastatic prostatic adenocarcinoma. *Conclusion:* Testicular pathology is a nosologically complex subjectbecause of the spectrum of histologic subtypes and variableclinical behaviour. Currently, treatment for most of the testicular neoplasms is orchiectomy, surveillance and radiation to the affected testis. Hence present study was undertaken to study thehistomorphological spectrumof lesions in orchidectomy specimens.

Keywords*:* Epididymo-Orchitis; Metastatic; Orchidectomy; Seminoma; Testicular Tumours.

Introduction

Testicular tumors are one of the most common malignancy among young males. There is a variable incidence among different countries, races and socioeconomic classes. Although testicular cancer accounts for only 1% of all tumors in male, it is themost common malignancy in males between 15 & 30 years of age [1].

Today patients with testicular cancer can expect to live longer and be cured of the disease. This improved prognosis stems from better diagnostic and treatment modalities.

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Surgical removal of a testis is indicated in testicular tumors, prostate cancer and cancer of the male breast, many non-neoplastic lesions like-undescended testis, torsion, epidydimo-orchitis, hematocele and testicular atrophy. Testicular non neoplastic lesions are common than neoplastic lesions of testis. In non-neoplastic lesions –cryptorchidism, testicular atrophy secondary to testicular injury and infections are common [2].

The clinical diagnosis of testicular tumor is delayed in many cases. No satisfactory classification is available, therefore the urologists, the radiologists and chemotherapists are essentially dependent upon histological diagnosis of testicular tumors and tumor like lesions.

Neoplasms of testis present with diffuse testicular swelling, hardness and pain [3]. The most common cause of testicular mass is infectious epididymitis or orchitis whose diagnosis is confirmed by testicular biopsy when serum concentrations of α-fetoprotein

(AFP), human chorionic gonadotropin (hCG) and lactate dehydrogenase (LDH) are normal [4]. This study was undertaken to document the histopathological spectrum of all the orchidectomy specimens received.

Aims and Objectives

1. To study the histopathological spectrum of non-neoplastic and neoplastic lesions in orchidectomy specimens.
2. To determine the frequency of different histopathological types of testicular tumors.

Materials and Methods

A retrospective study of orchidectomy specimens received in the department of pathology, in five years (January 2009 to January 2013) were taken for the study. All tumors and tumor like lesions of testis were included in this study. However, the orchidectomy specimens sent for infertility and recurrence of tumors had been excluded.

A total of 63 cases were studied. The specimens were fixed for overnight in 10%neutral buffered formalin (NBF). Detailed gross examination was undertaken looking at the external surface, tunica albuginea, solid and cystic areas, areas of hemorrhage and necrosis.The specimen was measured in all three dimensions, and the length of the cord was specified. Multiple representative sections were taken with a thickness of 3-5mm and embedded in a paraffin medium. Additional bits were also given from the paratesticular tissue to know the extent of tumor where malignancy was suspected. Paraffin-embedded sections were stained with hematoxylin-eosin (H-E) stain. All sections were reviewed.

Detailed clinical history of the patient, data of relevant investigations like ultrasonography, CT scan, serum marker assays were collected from the case sheets and histopathology forms. Histological findings were correlated with gross findings, investigational findings and serum marker assays.

Results

Total number of orchidectomy specimens received were 63. Out of the 63 cases, 46 cases were non-neoplastic and 17 cases were neoplastic. Distribution of the cases according to age is shown in Table 1. The most common age group for orchidectomy in our study was between 20-40 years. Distribution of the spectrum of non- neoplastic and neoplastic lesions have been listed in Table 2 and Table 3 respectively. A comparative table representing the spectrum of neoplastic lesions in our study versus the observations of all other similar studies in literature is illustrated in Table 4.

Table 1: Distribution of Testicular Lesions according to age group (N=63)

Age in Years	Number of Cases	Percentage (%)
0-20 years	14	22.3
20-40 years	26	41.3
40-60 years	15	23.8
60-80 years	08	12.6
Total	**63**	**100**

Table 2: Histopathological spectrum in non-neoplastic lesions (n=46)

Morphological Type	Number of Cases	Percentage
Chronic epidydimo-orchitis	12	26.0
Atrophied testis	08	17.3
Torsion of testis	06	13.0
Organized hydrocele	05	10.8
Acute epidydimo-orchitis	04	8.6
Pyocele	04	8.6
Infarcted testis	03	6.5
Gangrenous testis	02	4.3
Hematocele	01	2.3
Granulomatous inflammation	01	2.3
Total	**46**	**100**

Table 3: Histopathological spectrum in neoplastic lesions (n=46)

Morphological type	Number of lesions	Percentage
Seminoma	07	41.1
Mixed germ cell tumor	03	17.6
Lymphoma	02	11.8
Yolk sac tumor	02	11.8
Embryonal carcinoma	01	5.9
Spermatocytic seminoma	01	5.9
Metastatic adenocarcinoma	01	5.9
Total	**17**	**100**

Table 4: Comparison of Histopathological spectrum in neoplastic lesions (n=17) with various other studies

Lesion	Our study No (%)	Reddy *et al*[5]	Sanjay *et al*[6]	Baidya *et al*[7]	Patel *et al*[9]	Rathore *et al*[10]
Seminoma	07 (41.5)	06(37.5)	07 (38.9)	04(44.4)	04(26.6)	56 (56)
Mixed germ cell tumor	03 (17.6)	02(12.5)	06(33.3)	02(22.2)	01(6.7)	22 (22)
Non-Hodgkin's Lymphoma	02 (11.7)	01(6.4)	02(11.1)	02(22.2)	02(13.3)	09 (9)
Yolk sac tumor	02 (11.7)	00	01(5.6)	00	01(6.7)	03 (3)
Embryonal carcinoma	01 (5.9)	01(6.4)	00	00	00	00
Spermatocytic seminoma	01 (5.8)	00	00	00	01(6.7)	00
Metastatic adenocarcinoma	01 (5.8)	00	00	00	00	01(1)
Teratoma(mature, immature, teratocarcinoma)	00	04(25)	02(11.1)	01(11.2)	05(33.3)	07 (7)
Others	00	02 (12.2)	00	00	01(6.7)	02(2)

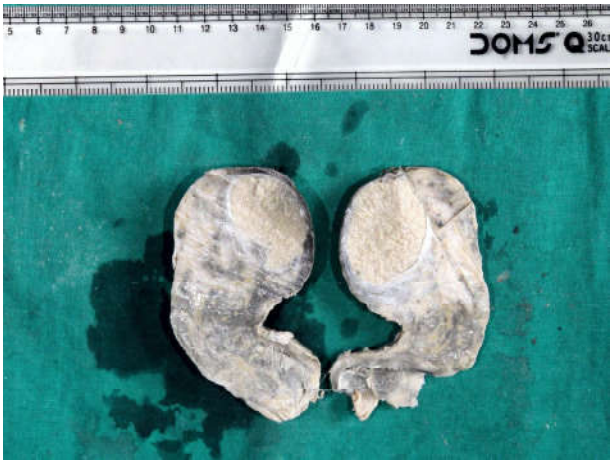

Fig. 1: Gross photograph of epididymo-orchitisshowing vague nodularity

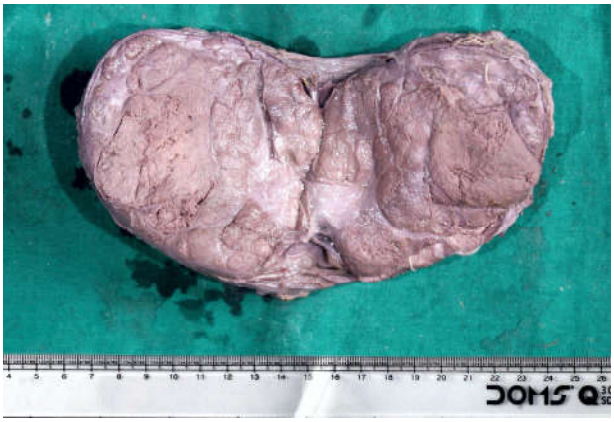

Fig. 2: Gross photograph of seminoma showing diffuse enlargement of the testis bulky grey white mass, lobulated appearance on cut surface

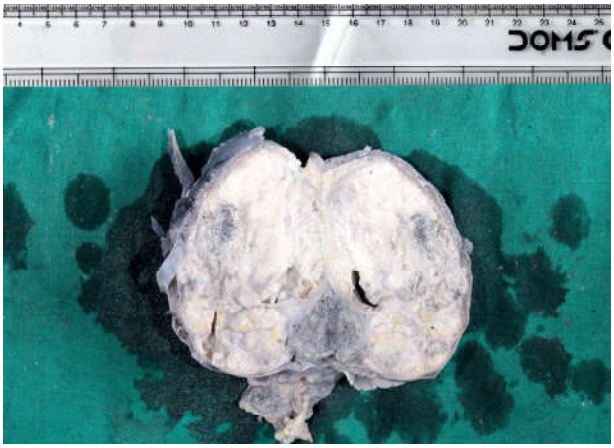

Fig. 3: Gross photograph of mixed germ cell tumor showing variegated cut surface with areas of necrosis and haemorrhage

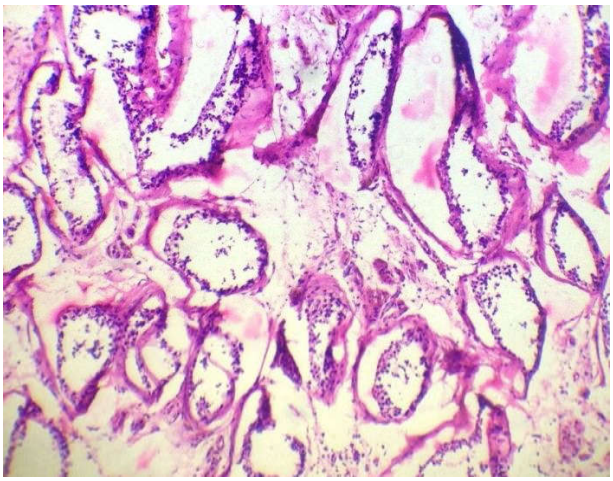

Fig. 4: Photomicrograph of atrophied testis (100x, H&E)

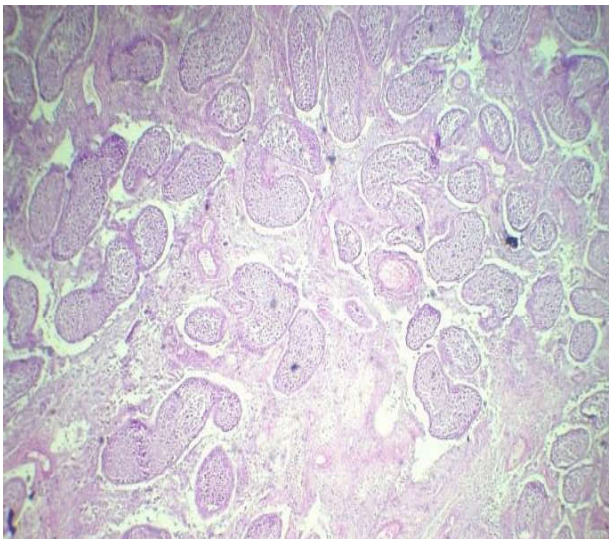

Fig. 5: Photomicrograph of torsion testis (100x, H&E)

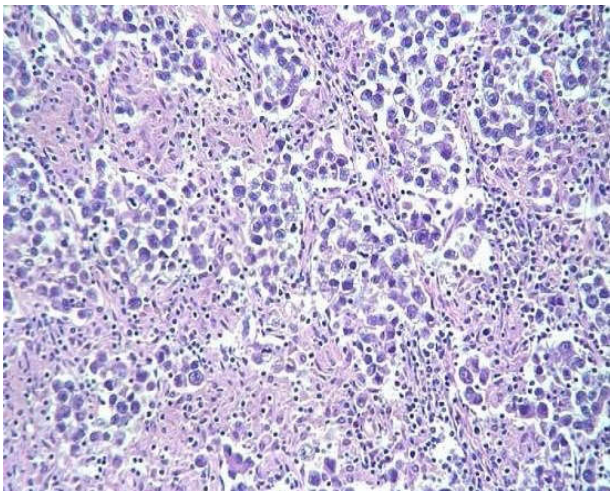

Fig. 6: Photomicrograph of seminoma showing tumor cells and lymhoplasmacytic infiltration in the fibrous septa (200x, H&E)

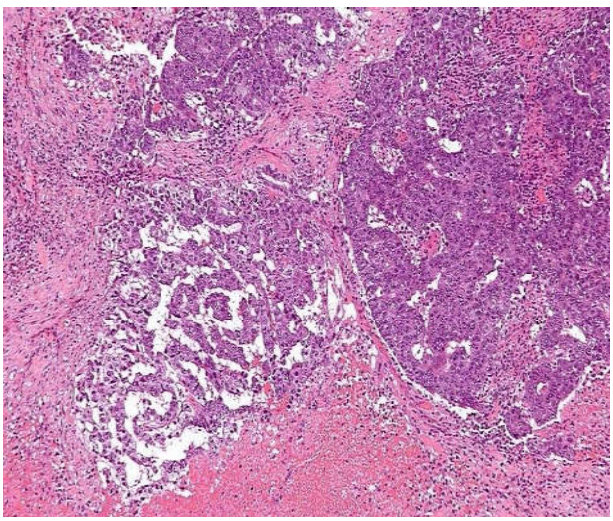

Fig. 7: Photomicrograph of mixed germ cell tumor showing embryonal carcinoma and yolk sac tumor (100x, H&E)

Discussion

Histopathological spectrum of testicular lesions ranges from non-neoplastic lesions to neoplastic lesions.Unilateral testicular involvement is more common than the bilateral as documented in literature. A radical orchiectomy consists of the testis, tunica vaginalis and a variable length of spermatic cord [4].

Currently, the treatment for most of the testicular neoplasms is orchiectomy, surveillance and radiation to the affected testicle. Pathologist play an important role in the treatment of patients effected with carcinoma of the testis by the accurate classification of tumors and pathological staging [1].

Out of the 63 cases in our study, 62 were unilateral while 1 case of metastatic adenocarcinoma presented as a bilateral testicular mass. In our study, the non-neoplastic cases (74.19%) were higher than the neoplastic cases (16.62%) similar to the study done by Reddy et al [5] and Sanjay et al [6] where non neoplastic cases were of 85% and 69.50% respectively. Among the non-neoplastic lesions, chronic epididymo-orchitis was the commonest, followed by atrophic testis, organized hydrocele, acute epididymo-orchitis, pyocele and others. The gross photographs and microphotographs of different testicular lesions are illustrated in Figure 1 to Figure 7.

In our study, 16 (34.7%) cases ofepididymo-orchitiswere reported. In a study by Sanjayet al [6], 33 cases (80.49%) were reported, however in a study done by Baidya et al [7], only 5 cases of epididymo-orchitis have been reported.

Torsion of the spermatic cord occurs within the tunica vaginalis or external to it. Torsion which leads to infarction or atrophy can be a cause for infertility. The severity of atrophy correlates with duration of torsion [4]. Atrophy is a risk factor to germ cell tumors in the undescended testis [3]. In our study, 6 cases (13.04%) of torsion testis were reported similar to the study done by Abba et al [8] where 10 cases (14.3%) were reported. A study done by Patelet al [9] documented 47 cases (55.29%) of torsion and infarction of testis, however, our study showed only 9 cases of (19.56%) torsion and infarction were reported.

The least among the non-neoplastic lesions of testis reported in our study was tubercular orchitis (2.2%). This is similar to the study by Reddy et al [5] and Sanjay et al [6] who documented 3 (3.5%) and 5 (12.19%) cases respectively, where as in a study done by Abba K. et al [8] 9 cases (12.9%) were reported. One of the most common causes of granulomatous orchitis is tubercular orchitis which is caused by M. Tuberculosis

disseminated from infection elsewhere in the body. Infection spreads to the testis heamatogenously or directly from the epididymis [4].

Although the incidence of testicular tumors is low, it is one of the most common malignancies occurring in young adults. However, they are the most common solid malignancies occur in the age group 15 to 35 years [3]. In our study, among the neoplastic lesions, seminoma was the commonest which constituted 7 cases (41.17 %) followed by mixed germ cell tumor, lymphoma, yolk sac tumor, embryonal carcinoma, spermatocytic seminomaand metastatic adenocarcinoma.

The origin of primary tumors of testis is the germ cell. All the cell types in the primary testicular tumor are capable of invasion [3]. The most common neoplasm of testis is seminoma comprising 40% to 50% of testicular tumors. Tumors of germ cell origin account for 94% to 96% of all testicular neoplasms [1].

For the purpose of treatment, germ cell tumors have been conventionally divided into two categories: Seminoma and Non Seminomatous Germ cell tumors (NSGCT). If the tumor is NSGCT, it must be further classified as a pure or a mixed tumor [3]. Spermatocytic seminoma which is a histological variant of seminoma was first described by Masson in 1946, it is a rare tumor comprising 3% to 7% of all seminomas [1].

Mixed Germ cell tumors account for 32% to 54% of primary testicular Germ cell tumors (GCT) [3]. Many different combinations of GCT components exist, most frequently a combination of embryonal carcinoma and seminoma (15%) is documented and rarely seminoma and Yolk sac tumor.

Pure seminoma account for approximately 50% of all testicular tumors, and occurs at an average age of 40 years Seminoma was the most common neoplastic lesion in studies done by Reddy et al [5], Sanjay et al [6], Baidya et al [7] and Patelet al [9], Rathore et al [10] where it constituted to 42.9%, 38.9%, 44.4%, 26.66% and 56% of the total neoplastic cases respectively.

According to WHO, only 2-10% of pure form embryonal carcinoma constitute to total testicular tumors, whereas it occurs as a component in more than 80% of mixed germ cell tumors [3]. In our study only 1 case of embryonal carcinoma was seen contributing for 6.25% of the testicular tumors, similar to the literature [3].

37.5% of our cases were non seminomatous germ cell tumors including yolk sac, mixed germ cell tumors and embryonal carcinoma, similarly in studies done by Reddy et al [5], Sanjay et al [6], Baidya et al [7], Patelet al [9] and Rathore et al [10] it was 3(21.3%), 7 (38.8%), 2 (22.2%), 2 (13.2%) and 25 (25%) respectively.

Primary malignant lymphoma of the testis is rare. Non-Hodgkin's Lymphoma is the most common neoplasm presenting as metastasis to the testis, comprising approximately 1% of testicular tumors[1]. Our study showed 2 cases (12.5%) similar to the study done by Reddy et al [5](7.1%).

Conclusion

The incidence of testicular neoplasms remains low in our population which is very clearly reflected by the amount of literature published in the past. Among the non-neoplastic lesions, our study showed epididymo-orchitis was the commonest, whereas, Seminoma accounted for the highest percentage of neoplastic lesions followed by mixed germ cell tumor.

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