ORIGINAL RESEARCH PAPER

Volume-8 | Issue-7 | July - 2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A STUDY OF TESTICULAR AND PARATESTICULAR LESIONS

Pathology

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ABSTRACT

There are various testicular and para testicular lesions occurring in different age groups. Testicular and para testicular lesions are categorized under non-neoplastic and neoplastic lesions. Despite new techniques in imaging and tumor marker assay the diagnosis of testicular and para testicular lesions are primarily dependent upon histopathological examination. Thus present study enlightens the importance of histopathological examination for the diagnosis and effective management of testicular and paratesticular lesions.

KEYWORDS

INTRODUCTION:

Testis is a paired oval organ that lies within scrotum of male body suspended by spermatic cord.[1] There are various testicular and para testicular lesions occurring in different age groups. They usually present with scrotal swelling, pain in scrotum and mass per abdomen. Para testicular lesions arising from spermatic cord, testicular tunics, epididymis and appendices.

Testicular and para testicular lesions are categorized under non-neoplastic and neoplastic lesions. Non–neoplastic lesions of testis include cryptorchidism, testicular atrophy, epididymo-orchitis, granulomatous orchitis, epidermoid cysts and torsion of testis. Non neoplastic lesions of para testis include epididymitis, tuberculosis, fungal infection, granulomatous inflammation, and vasitisnodosa etc.; among which epididymitis is the most common lesion.

Testicular tumor is the most common solid malignancy in men between the ages of 15 to 35 years which accounts for <1% of all malignancies in males.[2,3] Incidence of this neoplasm in western countries has been rising since past 50 years (Bergstorm et al.1996).[4]Patients with testicular carcinoma in one testis are 500– 1,000 times more likely to develop testicular carcinoma in the contralateral testis. The incidence of bilateral germ cell tumors (BGCT) varies between 0.5 and 7%.[5,6]

Tumor of testis is common in whites worldwide with Hispanics & Asians at intermediate risk and blacks at lowest risk. Testicular carcinoma follows a reverse pattern to most cancers with decreasing incidence rate with increasing age. Cryptorchidism, atrophy, trauma and hormonal or genetic factors are known risk factors for the development of a testicular germ cell tumor.[7]Para testicular tumors include adenomatoid tumor, mesothelioma, carcinoma of epididymis, lymphoma, leiomyoma, leiomyosarcoma, hemangioma, etc.

Significant advances in the understanding of diseases, various investigative modalities per say, Routine tests, X-ray, Ultrasound, CT scan, tumor markers assay and finally histopathological examination is of useful guide. Despite new techniques in imaging and tumor marker assay the diagnosis of testicular and para testicular lesions are primarily dependent upon histopathological examination. Treatment of testicular lesions includes operative procedures like orchiectomy, retroperitoneal lymph node dissection etc. Radiation therapy and chemotherapy have tremendous influence on management of all testicular lesions.

The present study is undertaken to study the diverse histopathological patterns of testicular and para testicular lesions and thus offering a specific diagnosis which holds clinical significance in management.

AIMS AND OBJECTIVES:

The present study was done with a view:

1. To study the incidence of testicular and para testicular lesions.
2. To study the various histopathological patterns of testicular and para testicular lesions.
3. To study the relative incidence of various testicular and para testicular lesions among different age groups.
4. To compare the obtained results of the present study with other studies done.

Material and methodology:

STUDY DESIGN: Cross sectional and observational study.

METHODS:

This study was carried out in the Department of Pathology at NHL Municipal Medical College, Ahmedabad. We have analyzed 90 histopathological reports of surgical specimens of testicular and para testicular tissues obtained from patients admitted in various surgical wards from July 2014 to October 2016. A detailed history of each patient regarding age, registration number, biopsy number, chief complaints & other relevant findings were taken. The specimen was fixed in 10% formalin. Each specimen was examined grossly. Tissue bits from representative areas were sampled from the specimen. Tissue bits were processed by routine paraffin embedding technique. Tissue sections of 3-5 µm thickness were cut and stained with Hematoxylin and Eosin stain. Slides were examined under light microscope for histopathological findings and final diagnosis was given.

WHO HISTOLOGIC CLASSIFICATION OF TUMORS OF TESTIS AND PARATESTIS

Germ cell tumours derived from germ cell neoplasia in situ
Non invasive germ cell neoplasia
Germ cell neoplasia in situ
Specific forms of intratubular germ cell neoplasia
Tumours of a single histological type (pure forms)
Seminoma
Seminoma with syncytiotrophoblastic cells
Non seminomatous germ cell tumours
Embryonal carcinoma
Yolk sac tumour, post pubertal –type
Trophoblastic tumours
Choriocarcinoma
Trophoblastic neoplasms other than choriocarcinoma
Placental site trophoblastic tumour
Epithelioid trophoblastic tumour

Cystic trophoblastic tumour
Teratoma, post pubertal-type
Teratoma with somatic type malignancies
Non seminomatous germ cell tumours of more than one histological type
Mixed germ cell tumours
Germ cell tumours of unknown type
Regressed germ cell tumour
Germ cell tumours unrelated to germ cell neoplasia in situ
Spermatocytic tumour
Teratoma,pre-pubertal type
Dermoid cyst
Epidermoid cyst
Well differentiated neuroendocrine tumour
Mixed teratoma and yolk sac tumour pre-pubertal type
Yolk sac tumour, pre-pubertal type
Sex cord/gonadal stromal tumours
Pure forms
Leydig cell tumour
Malignant Leydig cell tumour
Sertoli cell tumour
Malignant Sertoli cell tumour
Large cell calcifying Sertoli cell tumour
Intra tubular large cell hyalinizing sertol cell neoplasia
Granulosa cell tumour
Adult type granulosa cell tumour
Juvenile type granulosa cell tumour
Tumours of the thecoma/fibroma group
Mixed and unclassified sex cord- stromal tumours
Mixed sex cord- stromal tumours
Unclassified sex cord- stromal tumours
Tumours containing both germ cell and sex cord/gonadal stromal elements
Gonadoblastoma
Miscellaneous tumours of the testis
Ovarian epithelial –type tumours
Serous cystadenoma
Serous tumour of borderline malignancy
Serous cystadenocarcinoma
Mucinous cystadenoma
Mucinous borderline tumour
Mucinous cystadenocarcinoma
Endometrioid adenocarcinoma
Clear cell adenocarcinoma
Brenner tumour
Juvenile xanthogranuloma
Haemangioma
Haematopoietictumours
Diffuse large B-cell lymphoma
Follicular lymphoma,NOS
Extra nodal NK/T-cell lymphoma,nasal -type
Plasmacytoma
Myeloid sarcoma
Rosai-Dorfman disease
Tumours of collecting ducts and rete
Adenoma
Adenocarcinoma
Tumours of paratesticular structures
Adenomatoidtumour
Malignant mesothelioma
Benign mesothelioma
Well differentiated papillary mesothelioma
Cystic mesothelioma
Adenocarcinoma of the epididymis
Papillary cystadenoma of the epididymis
Melanoticneuroectodermaltumour
Desmoplastic small round cell tumour
Mesenchymal tumours of the spermatic cord and testicular adnexae
Secondary tumours of the testis

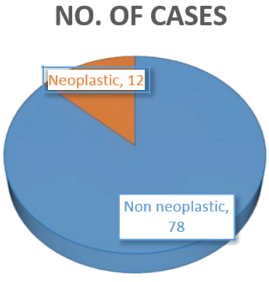
RESULTS:

Many of the patients had been diagnosed and treated at our hospital over a period of 28 months, i.e. from July 2014 to October-2016 were taken into consideration. This study consists of 90 cases among which 78 cases were non-neoplastic and 12 cases were neoplastic lesions.

Table 1: Distribution of Testicular and para testicular lesion according to type

Testicular and paratesticular lesions	No. of cases	Percentage (%)
Non neoplastic	78	86.67%
Neoplastic	12	13.33%
Total	90	100%

Table 1- Shows that among all the 90 cases, Non neoplastic lesions 78 cases (86.67%) were more common than neoplastic lesions 12 cases (13.33%).

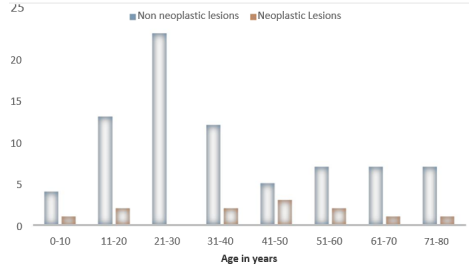


Graph 1: Graphical representation of Testicular and para testicular lesions according to type

Table 2: Age wise distribution of Testicular and para testicular lesions

Age in Years	Non neoplastic lesions	Percentage (%)	Neoplastic Lesions	Percentage (%)
0-10	4	4.44%	1	1.11%
11-20	13	14.44%	2	2.22%
21-30	23	25.55%	0	0%
31-40	12	13.33%	2	2.22%
41-50	5	5.55%	3	3.33%
51-60	7	7.78%	2	2.22%
61-70	7	7.78%	1	1.11%
71-80	7	7.78%	1	1.11%
Total	78	86.67%	12	13.33%

Table 2 shows age wise distribution of non-neoplastic & neoplastic lesions of testis and para testis. Maximum numbers of patients with non-neoplastic lesions were presented in third decade of life (25.55%). Maximum numbers of patients with neoplastic lesions were presented in fifth decade of life (3.33%).



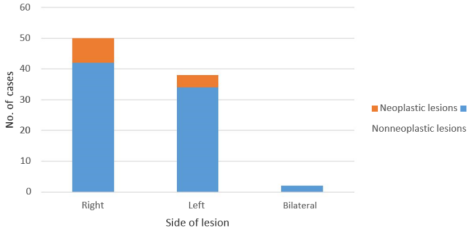
Graph 2-Graphical representation of testicular and para testicular lesions according to age and type of lesion

Table 3: Laterality wise distribution of testicular and para testicular lesions

Sr. No.	Laterality	Side	Non neoplastic lesions		Neoplastic lesions	
			No. of cases	Percentage (%)	No. of cases	Percentage (%)
1	Unilateral	Right	42	46.67%	8	8.89%
		Left	34	37.77%	4	4.44%
2	Bilateral		2	2.22%	0	0%
Total			**78**	**86.67%**	**12**	**13.33%**

Among non-neoplastic lesions, 76 cases were found to be unilateral involvement while 2 cases (2.22 %) had bilateral involvement. Right sided lesions (46.67%) were relatively more common than left sided lesions (37.77%). Among all neoplastic lesions, 12 cases were found to be unilateral involvement while none of the lesion is bilateral.

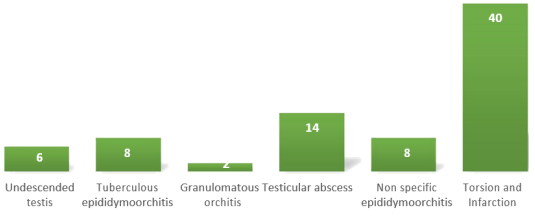
Right sided tumors (8 cases, 8.89%) were relatively more common than left sided tumors (4 cases, 4.44%).



Graph 3: Graphical representation of testicular and para testicular lesions according to laterality

Table 4: Histopathological diagnosis of non-neoplastic lesions of testicular and para testicular tissue

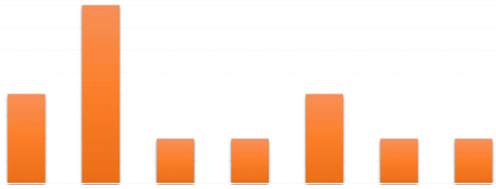
Sr. No.	HPE diagnosis	No. of cases	Percentage (%)
1	**Congenital lesions**		
	i) Undescended testis	6	7.69%
2	**Inflammation and infection**		
	i) Specific		
	a) Tuberculous epididymo-orchitis	8	10.25%
	b) Granulomatous orchitis	2	2.56%
	ii) Non specific		
	a) Testicular abscess	14	17.95%
	b) Nonspecific epididymoorchitis	8	10.25%
3	**Vascular lesion**		
	i) Torsion and infarction	40	51.28%
	Total	**78**	**100%**



Graph 4: Graphical representation of Non neoplastic testicular and para testicular lesions

Table 5: Histopathological diagnosis of neoplastic lesions of testicular and para testicular tissue

Sr. No.	HPE diagnosis	No. of cases	Percentage (%)
1	**Benign**		
	i) Mature Teratoma	2	16.67%
2	**Malignant**		
	i) Seminoma	5	41.67%
	a) Classical	(4)	(33.33%)
	b) Spermatocytic	(1)	(8.33%)
	ii) Yolk sac tumor	1	8.33%
	iii) Immature teratoma	2	16.67%
	iv) Non-Hodgkin's lymphoma	1	8.33%
	v) Mixed seminoma and teratoma	1	8.33%
	Total	12	100%



Graph 5: Graphical representation of neoplastic testicular and para testicular lesions

DISCUSSION:

Numerous authors have enumerated the incidence of neoplastic and non-neoplastic lesions of testis and para testis; which were equated with the current testicular and para testicular lesion study.

Table 6: Incidence of neoplastic and non-neoplastic lesions of testis and para testis

Sr. No	Authors (years)	Neoplastic	Non Neoplastic
1	Haas GP et al[8](1986)	8.33%	91.67%
2	Kressel K et al[9](1988)	16.73%	83.27%
3	Patel M B[10](2013)	15%	85%
4	Present Study (2016)	13.33%	86.67%

Table 7: Types of testicular and para testicular neoplastic lesions

Sr. No	Authors (years)	Benign	Malignant
1	Haas GP et al [8](1986)	31%	69%
2	Kressel K et al [9](1988)	13.6%	87.4%
3	Robertson GS[11](1995)	31.5%	68.4%
4	Present Study (2016)	16.67%	83.33%

Moreover, innumerable authors calculated the incidence of benign and malignant lesions amongst neoplastic lesions, which were compared with the present study. In present study malignant lesions were observed in 83.33% of cases and benign lesions were noted in 16.67% of cases which are almost similar to the previous researches. (Table 7)

Non-Hodgkin's lymphoma is uncommon disease. It comprises 5% of all testicular neoplasm. It is most common testicular tumor in elderly, among which diffuse large B-cell lymphoma variant is most common. In the present study 1 case of Non-Hodgkin's lymphoma was diagnosed (8.33%) which was small cell lympho-plasmacytic type.

Table 8: Side of involvement of testicular and para testicular lesion

Sr. No	Authors (years)	Side	
		Right	Left
1	W. Duncan [12](1987)	55.8 %	44.2%
2	Reddy & Ranganayakamma[13](1966)	64.3 %	35.7 %
3	Moghe K.V. et al [14] (1970)	54.2 %	45.8 %
4	Present Study (2016)	55.6 %	42.2%

Incidence of right and left sided lesions was 55.6% and 42.2% respectively, which is comparable to the earlier studies, as mentioned in Table 8.

Table 9:Relative percentage of different Non-neoplastic testicular and para testicular lesions

Type of lesion	Patel M. B.[10] (2013)	Reddy & Ranganayakamma.[13] (1966)	Present study (2016)
Undescended testis	**8.24**	**9.18**	**7.69**
Tuberculous epididymo-orchitis	9.41	7.35	10.25
Granulomatous orchitis	1.18	2.05	2.56
Testicular abscess	16.47	15.81	17.95
Nonspecific epididymo-orchitis	9.41	12.53	10.25
Torsion and Infarction	55.29	53.08	51.28

Table 9 indicates comparison between various types of non-neoplastic lesions. Our study showed the highest number of benign lesion as 51.28 % of cases diagnosed with testicular torsion and infarction, which is comparable with previous studies.

In the present study, for tuberculous epididymo-orchitis mean age was 50.8 years; which is similar to Suankwan U et al.[15]

In the present study, mean age for the cases of granulomatous orchitis was 45 years which is similar to the study given by Grunberg H[16]who found the prevalence to be most common in 5th decade.

The most commonly found abnormality, torsion and Infarction constituted 51.28%in the present study with the mean age 22.5 years which is similar to study given by Cuckowet al.[17]

Table 10: Relative percentage of different histological types of testicular germ cell tumors

Tumor type	Kurohara et al[18] (1968)	Friedman and moore[19] (1946)	Moghe K.V.[14](1970)	Present Study (2016)
Seminoma	49.5%	35%	41.6%	**41.67%**
Teratoma	42%	42%	36.4%	**33.33%**
Yolk sac tumor	4.5%	7.9%	10%	**8.33%**
Non-Hodgkin's Lymphoma	4%	8.5%	5.5%	**8.33%**
Mixed seminoma and teratoma	-	6.6%	6.5%	**8.33%**

Table 10 shows comparison of different types of germ cell tumors with other studies, our study showed 41.67 % of seminoma and 33.33% of teratoma, which are comparable to other authors.

As per a study conducted by Coppes MJ et al[19], incidence of para testicular tumor was 0.005% amongst all cases, which is comparable to current study as number of similar lesions were none, because such kind of lesions are very rare.

CONCLUSION:

Early diagnosis is beneficial for better treatment outcome which renders better quality of life to the patient.Histopathological examination has always been gold standard method for the diagnosis of various lesions. Moreover when used as an early diagnostic tool, it arrests spread of tumors to distant organs and improves prognosis.

Despite new techniques in imaging and tumor marker assay the diagnosis of testicular and para testicular lesions is primarily dependent upon histopathological examination.

Thus present study enlightens the importance of histopathological examination for the diagnosis and effective management of testicular and paratesticular lesions.

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