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Histopathological spectrum of testicular lesions- A retrospective study

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Abstract

Introduction & Objectives: Testis is affected by both neoplastic and non- neoplastic conditions. Although testicular neoplasms are rare, most of the previous studies of testis are on them only. Our study was undertaken to study histopathological spectrum, age-wise distribution, laterality and clinical presentation of all testicular lesions (both neoplastic and non- neoplastic).

Materials and Method: This was a three year retrospective study including all the testicular specimens referred to Department of Pathology, GMC Jammu from 1st Jan 2014 to 31st Dec 2016.

Results: The study comprised a total of 57 cases. Non- neoplastic testicular lesions were more common than the neoplastic ones (93 vs. 7%). Non- neoplastic lesions were most common in 2nd decade of life with a wide age range of 5 months- 80 years. Among non-neoplastic lesions (n=53), undescended testis (39.62%) was the most common non-neoplastic lesion followed by inflammatory lesions (24.53%), infarcted testis (torsion, 18.86%) and atrophic testis (16.98%). Inflammatory lesions included nonspecific epididymo-orchitis (15.1%), testicular abscess (5.66%) and tubercular epididymo-orchitis (3.77%). Only 4 cases (7%) of testicular neoplasm were diagnosed in the study period amounting to only 1.33 case/ year. All 4 cases were germ cell neoplasms with age range of 14 months- 35 years and mean age 20.54 years. One case each of seminoma, yolk sac tumour, immature teratoma and mixed germ cell tumour (mixed teratoma and seminoma) was diagnosed. All the lesions were unilateral and 58% of non-neoplastic lesions were right sided. Among both neoplastic and non-neoplastic lesions, the most common symptom was testicular (scrotal/inguinoscrotal) swelling (87%). The second most common presenting complaint was empty scrotum (36.84%) and pain (36%). Inflammatory lesions in addition had history of fever(22.80%). No tumour was found in undescended testes unlike western countries.

Conclusion: Majority of testicular lesions are non- neoplastic and neoplastic lesions are rare, most being germ cell neoplasms. Non- neoplastic lesions are seen in all age groups but neoplasms are usually seen in younger age. Non- neoplastic lesions mimic neoplastic ones clinically, testicular swelling being the most common complaint. So histopathological examination is necessary to serve an accurate diagnosis of testicular swellings. Our findings are comparable with most studies.

Keywords: Undescended testis, Germ cell neoplasm, Epididymo-orchitis, seminoma, teratoma, yolk sac tumour, Non-neoplastic.

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Introduction

Testis is affected by both non neoplastic and neoplastic conditions. There are various testicular lesions, ranging from paediatric to adult age groups. They usually present with scrotal swelling, pain and mass per abdomen. Non neoplastic testicular lesions include cryptorchid (undescended) testis, testicular torsion, testicular atrophy, epidermoid cysts, infections of testis like tuberculosis, infertility, malakoplakia and vasculitis.([1]

Undescended testis is the commonest genital malformation of the boys[(2)] and is found in approx. 1% of one year old boys.[(3)] An undescended testis is more likely to develop a germ cell tumour than a normally placed testis. Atrophy of testis may result from cryptorchidism, the orchitis of mumps, liver cirrhosis, estrogen administration, radiation exposure, chemotherapy, AIDS and exposure to environmental toxins.[(4)] Torsion of testis is a surgical emergency, commonly seen in 10-25 years of age.[(5)] Nonspecific epididymo-orchitis is commonly related to infections in the urinary tract and its cause varies with age. It may progress to frank abscess formation.[(6)] Tubercular epididymo-orchitis is a common form of genitourinary tuberculosis. It may coexist with pulmonary tuberculosis or tuberculosis of other parts of lower genitourinary system. It almost invariably begins in the epididymis and then spreads to testis. An isolated case is rare but when it occurs, it may mimic testicular tumour.[(7)]

The testicular tumours although relatively rare, are of great interest and importance because of their varied histological appearances and the diverse or even conflicting views held regarding their histogenesis.[(8)] They account for less than 1% of all malignancies in male; constitute the 4th most common cause of death from neoplasia in a younger male, usually found in age group 15-35 years. The incidence of testicular neoplasm in western countries is rising in the past 50 years.[(9)] Though the etiology of testicular cancer is not well understood, various factors such as cryptorchidism, trauma, infections and genetic and endocrine factors appear to have a role in their development.[(10)] A definite geographic and racial distribution is seen in testicular tumours.[(11)] Testicular carcinoma follows a reverse pattern to most cancers with decreasing incidence rate with increasing age.[(12)]

Clinically the diagnosis of testicular tumours is delayed in many cases.[(12)] Despite new techniques in imaging and tumour marker assays, the diagnosis of testicular lesions is primarily dependent upon histopathological examination.[(5)] The urologists, the radiologists and chemotherapists are eventually dependent upon histological diagnosis of tumour and tumour like lesions[(13)] as histopathological features have

a major stake in determining the prognosis and therapeutic option.[14]

Aims and Objectives

Although testicular neoplasms are rare, most of the previous studies of testis are on them only or on a single non neoplastic testicular lesion like torsion testis, undescended testis etc. Our study was undertaken to study:

- Histopathological spectrum
- Age wise distribution
- Laterality
- Clinical presentation of all testicular lesions including both neoplastic and non-neoplastic lesions in one go.

Materials and Method

This was a three year retrospective study including all the testicular specimens referred to Department of Pathology, GMC Jammu from 1st Jan 2014 to 31st Dec 2016. The bilateral orchidectomy specimens of prostatic carcinoma patients, were excluded from our study. All the slides along with histopathology requisition forms containing clinical details were retrieved and reviewed. The tumours were classified according to WHO classification (2004).[15] The data collected was tabulated, analysed and compared to other similar studies.

Results

- The study comprised a total of 57 cases.
- Non- neoplastic testicular lesions were more common than the neoplastic ones (93 vs 7 %, n=53 vs 4).

Histopathological spectrum

- Undescended testis (39.62%, n=21) was the most common non-neoplastic lesion followed by inflammatory lesions (24.53%, n=13), infarcted testis (torsion, 18.86%, n=10) and atrophic testis (16.98%, n=9). Inflammatory lesions included nonspecific epididymo-orchitis (15.09%, n=8), testicular abscess (5.66%, n=3) and tubercular epididymo-orchitis (3.77%, n=2) (Fig. 1).

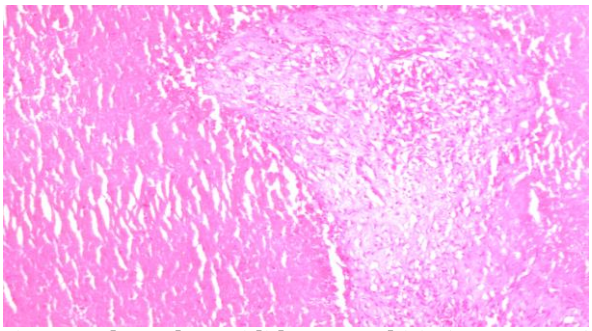

Fig. 1: Tubercular epididymo- orchitis (H&E, 200X)

- Only 4 cases of testicular neoplasm were diagnosed in the study period amounting to only 1.33 case/ year. All 4 cases were germ cell neoplasms. One case each of seminoma (Fig. 2), yolk sac tumour (Fig. 3), immature teratoma (Fig. 4 & 5) and mixed germ cell tumour (mixed teratoma and seminoma) was found. No sex cord stromal tumour, lymphoma or metastasis was encountered.

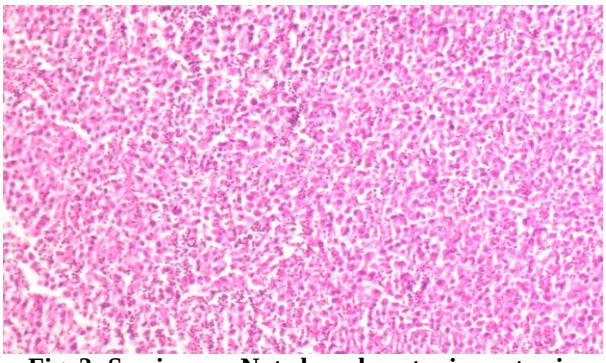

Fig. 2: Seminoma. Note lymphocytes in septae in between lobules of round uniform cells with clear cytoplasm and central nuclei. (H&E, 200X)

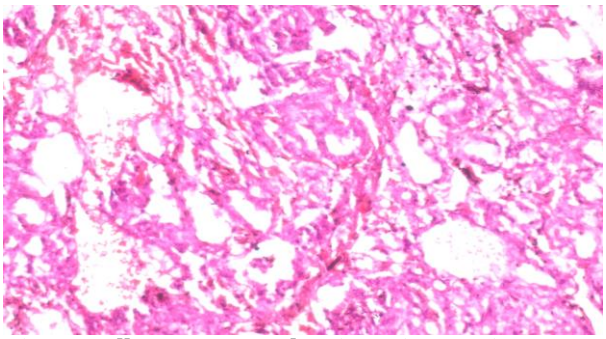

Fig. 3: Yolk sac tumour showing microcystic pattern (H&E, 200X)

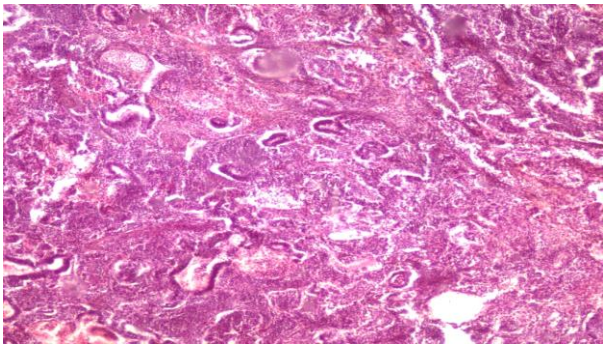

Fig. 4: Immature teratoma showing immature neuroectodermall tissue (H&E, 200X)

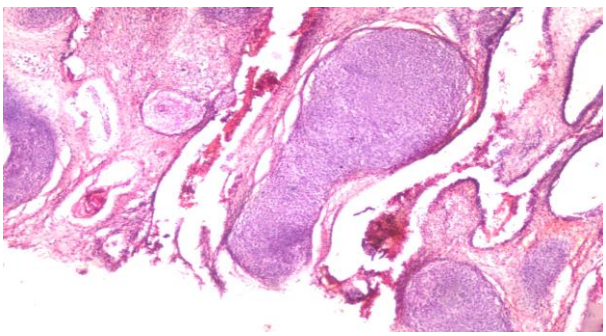

Fig. 5: Immature teratoma showing immature cartilage (H&E, 200X)

Age Distribution

Table 1: Histopathological spectrum of non neoplastic testicular lesions along with age distribution

Lesion	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Undescended testis	4	10	4	1	1	0	1	0	21 (39.62%)
Torsion testis	0	6	1	2	1	0	0	0	10 (18.86%)
Atrophic testis	0	0	3	0	2	2	1	1	9 (16.98%)
Nonspecific epididymo-orchitis	0	0	0	1	1	4	1	1	8 (15.09%)
Testicular abscess	0	0	1	0	1	1	0	0	3 (5.66%)
Tubercular epididymo-orchitis	0	0	0	1	0	0	1	0	2 (3.77%)
Total	4	16	9	5	6	7	4	2	53 (100%)
Percentage	7.5%	30.19%	16.98%	9.43%	11.32%	13.21%	7.55%	3.77%	100%

- Non- neoplastic lesions were most common in 2nd decade of life with a wide age range of 5 months- 80 years with mean age 35.64 years. 54.71% cases were with age ≤30.
- Undescended testis, the most common non neoplastic lesion in our study, was also most common in second decade with mean age 20.5 years and age range 5 months- 65 years. 86% were ≤30 years.
- Infarcted testis (torsion) cases ranged from 14-48 years with 70% ≤30years and 24.1 years mean age. They were also most common in second decade.
- Atrophic testis ranged from 22-75 years with mean age 47.11 years. They were most common in third decade of life.
- Inflammatory lesions, the second most common non neoplastic lesions, ranged from 28-80 years with maximum cases in 6th decade. Mean age was 50.86 years. Among inflammatory lesions, mean ages of nonspecific epididymo-orchitis, abscess and tubercular epididymo-orchitis were 65.75, 42.33 and 51.5 years respectively.
- All 4 neoplastic cases were germ cell neoplasms with age range of 14 months- 35 years and mean age 20.54 years.

Table 2: Age distribution of neoplastic testicular lesions

Lesion	0-10	11-20	21-30	31-40	Total
Seminoma			1 (28 years)		1 (25%)
Immature teratoma		1 (18 years)			1 (25%)
Yolk sac tumour	1 (14 months)				1 (25%)
Mixed germ cell tumour(Mixed seminoma and teratoma)				1 (35 years)	1 (25%)
Total	1	1	1	1	4 (100%)

Laterality

- All the lesions were unilateral.
- 58% of non-neoplastic lesions were right sided.
- 50% of neoplastic lesions were right sided.

Clinical Presentation

- Among both neoplastic and non-neoplastic lesions, the most common symptom was testicular (scrotal/inguinoscrotal) swelling.
- 83.02% (n=44) of non neoplastic lesions presented with swelling with 50.94% having painless swelling. The second most common presenting complaint was empty scrotum (39.62%) followed by pain (32.07%).
- Inflammatory lesions in addition had history of fever.
- No tumour was found in undescended testes unlike western countries.
- All 4 neoplasms presented with painless swelling.

Discussion

In our study the non neoplastic testicular lesions were more common than the neoplastic ones (93 vs 7%). This is in concordance with Reddy H et al (86 vs 14%)[1] and Patel MB et al (85 vs 15%)[5] but doesn't correlate with Robertson GS et al (31.5 vs 68.4%).[16]

Testicular swelling was the commonest symptom in the present study similar to previous studies[1,5] Right sided testis was more commonly involved in ours' and Patel MB's[5] studies but reverse result was found by Reddy H et al.[1]

Table 3: Comparison of Histological Types of Non Neoplastic Testicular Lesions

Lesion	Patel MB[5] 2015, n=85	Reddy H[1] 2016, n=86	Abba K[17] 2016, n=70	Present Study n=53
Undescended testis	8.24%	14%	10%	39.62%
Torsion testis	55.29%	22.1%	14.3%	18.86%
Atrophic testis	-	19.8%	-	16.98%
Nonspecific epididymo-orchitis	9.4%	3.5%	10%	15.1%
Testicular abscess	16.47%	19.76%	4.3%	5.66%
Tubercular epididymo-orchitis	9.4%	3.5%	12.9%	3.77%
Others	1.2%	17.44%	48.6%	-

The most common non neoplastic lesion vary from study to study. We found undescended testis and inflammatory lesions to be most common. In previous studies torsion is the most common lesion. We found non-neoplastic lesions to be most common in 2nd decade of life similar to Patel MB.[5] More than 50% were in first three decades of life in our study unlike previous studies. This variation is because of variation in relative proportion of different histological types. The age distribution of individual non neoplastic lesion was found to be in concordance with previous studies.

As described in literature, testicular tumours were found to be rare in present study also. Infact, we found them to be rarer than previous studies. We found only 4 cases amounting to only 1.33 case per year in our three year study. Incidence of testicular tumours varies from country to country and place to place thus pointing to various causative factors.[24]

Table 4: Comparison of Average number of testicular neoplasms per year

S No.	Study (Year)	Country	Average no. of cases per year
1	Horwich et al (2013)[18]	England	64.9
2	Walschaerts et al (2008)[19]	France	53.2
3	Chalaya PL et al (2014)[20]	Tanzania	5.6
4	Deora A et al (1994, 18 years study)[21]	India	5.5
5	Chakrabarti PR et al (2016, 10 years study)[22]	India	3.7
6	Salako AA et al (2010)[23]	South Western Nigeria	1.5
7	Present study (3 years study)	Northern India	1.33

As per Mostofi and Price,[25] germ cell tumours constitute more than 94% and stromal tumours consist of 3% of testicular tumours. Other studies also had similar results. Our 100% cases of testicular neoplasms were germ cell tumours only. No sex cord stromal tumour, lymphoma or metastasis was encountered.

Table 5: Comparison of histological types of testicular neoplasms in various studies

Tumour type	Patel MB[5] 2015 n=15	Deore KS[12] 2015 n=15	Chakrabarty PR[22] 2016 n=37	Reddy H[1] 2016 n=14	Sanjay M[13] 2016 n=18	Gupta A[26] 2016 n=50	Present study n=4
Seminoma	40%	26.67%	35.14%	42.9%	38.9%	48%	25%
Teratoma	33.3%	13.33%	2.7%	-	11.11%	12%	25%
Embryonal carcinoma	-	-	-	7.2%	-	16%	-
Yolk sac tumour	6.6%	6.67%	2.7%	-	5.55%	4%	25%
Mixed germ cell tumour	-	33.33%	32.43%	43%	33.33%	16%	25%
Others	20%	20%	27%	7.2%	11.11	4%	-

According to literature, the histological pattern and behaviour of the testicular tumours differs with age. Testicular neoplasm of germ cell origin is the most common malignancy in men aged between 18-35 years.[27] All our cases were also found in men younger than 40. Non seminomatous tumours are known to present in younger age than seminomatous type.[28] We had similar findings as found one pure seminoma in 3rd decade, one mixed germ cell tumour with seminoma as one component in 4th decade and two non seminomatous tumours; one yolk sac tumour and one immature teratoma in 1st and 2nd decades respectively.

Cryptorchidism is the single most important risk factor associated with testicular cancer with 10% of all testicular cancer patients having history of cryptorchidism.[20] Although we found 21 cases of undescended testis, none of them showed neoplastic focus and also none of the 4 cases of testicular neoplasms had history of undescended testis. Our finding is in concordance with Reddy H et al.[1]

Most of our findings are comparable to previous studies. Variations found may be because of small number of cases especially of tumours. A follow up study involving a larger study population and longer duration is recommended.

Conclusion

- Majority of testicular lesions are non- neoplastic and neoplastic lesions are rare, most being germ cell neoplasms.
- Non- neoplastic lesions are seen in all age groups but neoplasms are usually seen in younger age.
- Non- neoplastic lesions mimic neoplastic ones clinically, testicular swelling being the most common complaint.
- So histopathological examination is necessary to serve an accurate diagnosis of testicular swellings.
- Our findings are comparable with most studies.

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