

Histomorphological analysis of testicular lesions

Hemavathi Reddy^{1,*}, Hanishkumar Chawda², Vijay D. Dombale³

¹Tutor, Koppal Institute of Medical Sciences, Koppal, Karnataka, ²Assistant Professor, Late Shri Lakhiram Aggarwal Memorial Govt. Medical College, Raigarh, Chattisgarh, ³Professor & HOD, Dept. of Pathology, BKL Walawalker Rural Medical College Kasarwadi, Ratnagiri, Maharashtra

***Corresponding Author:**

Email: hemareddy79@gmail.com

Abstract

Background: Testis is affected by both non neoplastic and neoplastic conditions. Non-neoplastic causes include undescended testis, vascular lesions, atrophy, cysts, infections and infertility. Testicular tumors are although relatively rare, incidence of testicular neoplasm in western countries has been rising since past 50 years. Constitute 4th most common cause of death from neoplasia in a younger male.

Objectives: To study various lesions of testis, their incidence and age wise distribution of testicular lesions.

Materials and Methods: Retrospective study of all 100 orchidectomy specimens was conducted between July 2012 to June 2014(2yrs), at department of pathology SNMC Bagalkot and peripheral centres. Histopathological examination was done after routine processing and staining with H&E.

Results: Non-neoplastic lesions of the testis are most common in the 5th decade, while malignancy is common in 3rd decade of life. 86% were non neoplastic and 14% were neoplastic. Youngest patient is 11 yr old and oldest is 80 yrs old. Testicular swelling was main chief complaint and left side testis affected more with an incidence 35%. Testicular torsion was most common benign lesion and seminoma was most common tumour with incidence of 50% diagnosed in malignant lesions. 14% of lesions were of undescended testis but none showed malignancy.

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

Key words: Undescended testis, Testicular torsion, Neoplasms, Histopathology, Testis

Introduction

Testis is a male gonad, it is homologous with the ovary of the female genital system and it is a unique and important organ of male reproductive system.¹ Testicles are a very delicate part of male body. Testis is a paired oval organ that lies within scrotum suspended by spermatic cord².

There are various testicular lesions, ranging from pediatric to adult age groups. They usually present with scrotal swelling, pain in scrotum and mass per abdomen.

Testis is affected by both non-neoplastic and neoplastic condition. Non-neoplastic causes include cryptorchid testis, testicular torsion, testicular atrophy, epidermoid cysts, infections of testis like tuberculosis, infertility², malakoplakia and vasculitis. Cryptorchid testis is 30-50 times more likely to develop malignant neoplasm by Gilbert & Hamilton - 10.9% occurred in cryptorchid organs². Atrophy of testis may result from a large variety of causes mainly orchitis of testis by mumps², liver cirrhosis², administration of estrogens, radiation exposure, chemotherapy and exposure to environmental toxin. Testicular atrophy affects 5% of AIDS patients.² Infarct of testis is usually result from torsion of the spermatic cord it may also occur due to venous thrombosis secondary to phylogenetic epididymoorchitis.² Torsion of testis, among which cryptorchidism accounts for approximately 1% of 1 year old boys. It is unilateral in 80% of cases. Torsion

of testis is a surgical emergency commonly seen in 10-25 years of age. Tuberculosis, atypical mycobacteriosis, leprosy, sarcoidosis and syphilis and chrons disease can involve testis.²

The testicular tumors although relatively rare, constitute 4th most common cause of death from neoplasia in a younger male. It is usually found in age groups of men between 15-35 years which accounts for less than 1% of all malignancies in males³. The incidence of this neoplasm in western countries is rising in the past 50 yrs.⁴ Its incidence has been increasing since the middle of twentieth century in many Western countries with the potential exception of children ages 14 years or less, where little variation is observed.⁵

Testicular carcinoma follows a reverse pattern to most cancers with decreasing incidence rate with increasing age. Cryptorchidism, Klinefelter syndrome and strong family are the predisposing risk factors in development of testicular germ cell tumors⁵.

Significant advances in the understanding of diseases, various investigative modalities per say, Routine tests, X-ray, Ultrasound, CT scan, Intravenous urography, tumor marker assay and finally histopathological examination is of useful guide. Despite new techniques in imaging and tumor marker assay the diagnosis of testicular lesions is primarily dependent upon histopathological examination.

Clinical data, operative findings and gross features of lesions may provide important and at times decisive

diagnostic clues. The present study is undertaken to study the diverse histopathological patterns of testicular lesions and thus offering a specific diagnosis which is of paramount clinical significance.

Aims and Objectives

1. To study the incidence and various histopathological patterns of testicular lesions.
2. To determine the relative incidence of various testicular lesions among different age groups.
3. To find out incidence of neoplastic testicular lesions and to study their different histomorphological patterns.

Material and Methods

Present study is the descriptive study of the gross and histopathological findings of testicular radical orchidectomy specimens in 100 specimens, received in the department of pathology, Shree Nijalingappa Medical College, a tertiary health care centre, Bagalkot and peripheral centres Bagalkot, over a period of 2 years that is from July 2012 to June 2014. In this study the orchidectomy specimens which had been sent for infertility had been excluded.

Due importance was paid to record a brief clinical history with age, registration number, biopsy number, presenting signs & symptoms. All patients were investigated with Routine haemogram, X- ray chest, Ultrasound of abdomen, when required serum marker assay for Alpha-fetoprotein, human chorionic gonadotropin and CT scan were done.

Thorough gross examination was carried out and noted findings like right or left side, external surface, condition of the scrotal skin and tunica albuginea, consistency, size of tumor, appearance of cut surface, color, necrosis or hemorrhage, condition of surrounding testicular tissue, epididymis, and spermatic cord and surgical margin. Lymph nodes, whenever received, along with the specimen were scrutinized for evidence of metastasis. Grossly multiple representative tissue sections of 3–4 mm thickness varying from 2 to 10 sections from tumor, part of normal testicular tissue, epididymis, and spermatic cord (surgical margin) were taken. The Gross specimens received were fixed in 10% neutral buffered formalin for overnight fixation. Next day morning, gross examination of fixed specimen is done and the sections are taken from representative sites. These sections are further processed into automated tissue processor. After processing, sections are embedded in paraffin to make paraffin blocks. These blocks are then cut serially in three to five micron thickness using rotatory microtome to prepare slides. Slides are then stained using routine Haematoxylin & Eosin stain and then mounted with DPX. Special stains are not carried out. These microscopic findings were then correlated with clinical diagnosis and came to a proper conclusion.

Results

Table 1 and 2 reveals both non-neoplastic and neoplastic lesions of testis along with their age group. Among non-neoplastic lesions youngest patient 11 yrs old while the oldest patient was 80 year old, maximum number of patients presented in fifth decade of life (22.1%), followed by age 2nd and 6th decade of life, comprising 20.9% and 19.8%.

Among neoplastic lesions youngest patient was 11 year old while the oldest patient was 68 year old. Maximum number of malignant lesions are present in third decade of life (50%).

Among microscopical diagnosis of non-neoplastic lesions testicular torsion was the highest with 19(22.1%) followed by testicular atrophy 17(19.8%). Thus, torsion and atrophy the most commonly found abnormality constituted 36 out of 86 cases (41.86%) in the present study. Testicular abscess was found in 17 cases out of 86 cases (19.76%) in the present study. Twelve cases of undescended testis out of 86 cases (14%) had been identified and but none showed malignancy. Three cases of Tubercular orchitis and epididymo-orchitis had been identified (3.5%) and age was ranging from 20–45 years, mean age was found to be 32.5yrs.

Testicular lesions presented with varied symptoms accounting testicular swelling, lower abdominal lump, pain and fever. Chief complaints studied among benign lesions swelling in left testis 35% was highest followed by right testis 32% but it was opposite among malignant lesions, right sided tumours were more common than(9 cases, 65%) left sided tumours (5 cases, 35%).

Out of all neoplastic lesions of testis, maximum number of cases were seminoma (42.9%) followed by teratocarcinoma (28.6%).

Tumor marker study is important for clinical significance, diagnosis and management of germ cell tumors. Out of 6 patients of seminoma, AFP (Alpha Fetoprotein) and -Human Chorionic Gonadotropin was elevated in 3 patients.

Discussion

Various authors have studied the incidence of benign and malignant lesions, which were compared with the present study. In present study malignant lesions constituted 14% and benign lesions constituted 86% which are not correlating to the earlier studies (Table 3⁶⁻⁹), this might be because of shorter duration of study and less sample size.

Testicular swelling constituted >90% in the present study and it was 81.5% and 60% in studies by W. Duncan et al¹⁰ and Deotra A et al¹¹ respectively and which was correlating with our study. Relative frequency of testicular torsion is 22% in present study and which were 10.1%, 13.1% and 48% in studies done by Srinivasn A et al¹², Rizvi SA et al¹³ and Rampaul

MS¹⁴, this variation in the data is due to shorter duration of study.

Table 4 reveals frequency of side of involvement, Testicular lesions were maximum in right side comparative to left side in Deotra A et al(60%)¹¹ and Mahesh BP et al(59%)⁹ but present study revealed maximum number of cases in left side(58%), which is not equally comparable with earlier studies because maximum number of cases are of benign lesions in the present study compared to the previous studies. There were 3 cases of Non-specific epididymo-orchitis out of 86 cases (3.5%). Age ranging from 20-45 years which is similar to the study given by Kaver et al¹⁵.

As described in the literature, testicular tumors were found to be rare in this study also. Undescended testes comprised 14%(12 cases) of the total testicular specimens received; however, none of them showed malignancy. Most of the malignant cases were seen in the second and third decade, 11 cases(78.57%).

According to the literature, the histological pattern and behavior of the tumor differ with age. One case of Seminoma seen at 11 yrs old. In young adults, seminoma, embryonal carcinoma, teratoma, and teratocarcinoma are common but seminoma is more common in the fourth decade whereas spermatocytic seminoma and lymphoma occur in the elderly. Seminomas have not been reported in infants, while embryonal carcinoma and teratoma are the most common tumors of infancy and childhood. Out of the total 14 malignant tumors in this study, 78.57% (11 cases) consisted of germ cell tumors. According to Mostofi and Price¹⁶ germ cell tumors constitute more than 94% of testicular tumors and other study also showed similar percentage of germ cell tumours⁹.

Among the 11 cases of germ cell tumors in this study, 2 (18.18%) were mixed germ cell tumors. Seminoma comprises 35-71% of testicular tumors. In this study, seminoma consisted of 54.54(6 cases) of all testicular tumors. A single case of Embryonal Ca(7.14%) seen at 43 yrs of age. Age group of patients studied among Neoplastic lesions in 3rd decade in Syed Q et al (39.7%)¹⁷ and Deotra et al (32%)¹¹ studies and it was 50% in present study & almost closer to earlier studies. Relative frequency of testicular tumours among cancers by different authors compared with present

study and it was correlated. NHL is the most common neoplasm presenting as metastasis to the testis, comprising approximately 1% of testicular tumors¹⁶. It may occur at any age, ranging from 21 to 87 years with most of the cases presenting in the sixth and seventh decades. But no single case of NHL found in our study.

Hodgkin lymphoma occurring primarily in testis has not yet been reported so far in the literature. Hodgkin lymphoma was not seen in this study as well. This variation in data may be due to the small number of cases included in this study.

According to Stainman et al testis is a very rare location for malignant fibrous histiocytoma¹⁸. One very rare case of malignant fibrous histiocytoma (6.66%) seen at 67 yrs of age.

According to Mostofi et al¹⁶, stromal tumors consist of 3% of testicular tumors. However, in this study stromal tumors were not encountered. This could be due to the small number of cases and shorter duration of the study. Since, this study was limited by small number of cases, follow up study involving a larger study population is recommended.

Conclusion

We concluded that non neoplastic lesions of testis are commoner than neoplastic.

Non-neoplastic lesions of the testis are most common in the 5th decade while malignancy is common in 3rd decade of life. Lesions can be seen from younger to older age group. Testicular swelling was main chief complaint, left sided involvement is common than the right side. Out of all non-neoplastic lesions, vascular lesion like torsion was the predominant finding. Testicular tumors are uncommon in our population also. Germ cell tumors formed the bulk of testicular tumors. Among the individual germ cell tumors, Seminomas were the most common followed by Teratocarcinoma however, unlike in the Western population, malignancy developing in the undescended testes was rare. It is concluded that, despite new techniques in imaging and tumor marker assay the diagnosis of testicular lesions primarily dependent upon histopathological examination.

Table 1: Different Diagnosis made in the non-neoplastic testicular specimens

	11-20	21-30	31-40	41-50	51-60	61-70	>70	Total (n=86)
Testicular torsion	3	3	4	3	4	2	0	19(22.1%)
Testicular atrophy	2	3	3	2	5	2	0	17(19.8%)
Testicular abscess	3	2	3	3	3	2	0	17(19.76%)
Undescended testis	5	2	3	1	1	0	0	12(14%)
Vaginal hydrocele	1	0	0	1	4	0	1	7(8.1%)
Epididymo - orchitis	1	0	1	1	0	0	0	3(3.5%)
Tubercular-orchitis	1	0	0	2	0	0	0	3(3.5%)
Normal testicular tissue	2	0	0	0	0	0	0	2(2.3%)

Chylocele	0	0	0	1	0	0	0	1(1.2%)
Hematocele	0	0	0	1	0	0	0	1(1.2%)
Neurofibroma with atypical lipoma	0	0	0	1	0	0	0	1(1.2%)
Orchitis with Testis torsion	0	0	0	1	0	0	0	1(1.2%)
Suppurative lesion	0	0	0	1	0	0	0	1(1.2%)
Spermatocoele	0	0	0	1	0	0	0	1(1.2%)
Total	18 (20.9%)	10 (11.6%)	15 (17.4%)	19 (22.1%)	17 (19.8%)	6 (7%)	1 (1.2%)	86%

Table 2: Diagnosis among Neoplastic lesions with age group

Age group	Malignant Mixed Germ Cell Tumour	Seminoma	Malignant Non Seminomatous Germ Cell Tumour	Teratocarcinoma	Embryonal carcinoma	Malignant Fibrous Histiocytoma	Total
10-20		2		2			4(28.6%)
21-30	1	3	1	2			7(50%)
31-40		1					1(7.2%)
41-50					1		1(7.2%)
51-60					0		0(0%)
61-70						1	1(7.2%)
>70					0		0
Total	1(7.2%)	6(42.9%)	1(7.2%)	4(28.6%)	1(7.2%)	1(7.2%)	14%

Table 3: Comparison of percentage incidence of benign and malignant lesions

Sr No	Authors(Years)	Benign	Malignant
1	Haas GP et al (1986) ⁶	31%	69%
2	Kressel K et al(1988) ⁷	13.6%	87.4%
3	Robertson GS(1995) ⁸	31.5%	68.4%
4	Mahesh BP (2013) ⁹	20%	80%
5	Present Study (2014)	86%	14%

Table 4: Side of involvement of Testicular Lesions

Sr No	Authors(Years)	Right side	Left side
1	W Duncan (1987) ¹²	55.8%	44.2%
2	Mahesh BP(2013) ⁹	59%	39%
3	Present study (2012)	42%	58%

Graph 1: Graph showing type of lesion

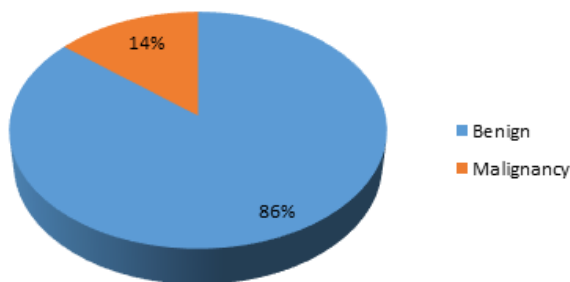


Fig. 1: Gross picture of Testicular torsion

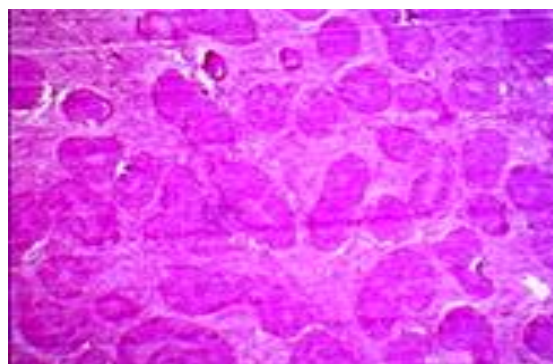


Fig. 2: Microscopy picture of Testicular torsion Areas of hemorrhage and necrosis. H & E, 100x

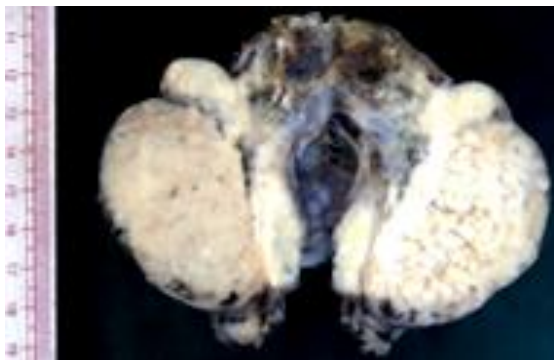


Fig. 3: Gross picture of Tb orchitis

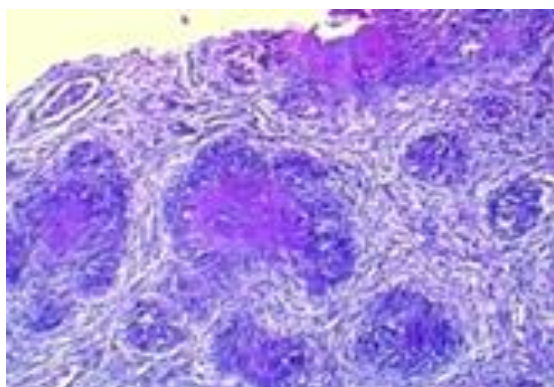


Fig. 4: Micro picture of Tb orchitis Foci of granulomas. H&E, 100X

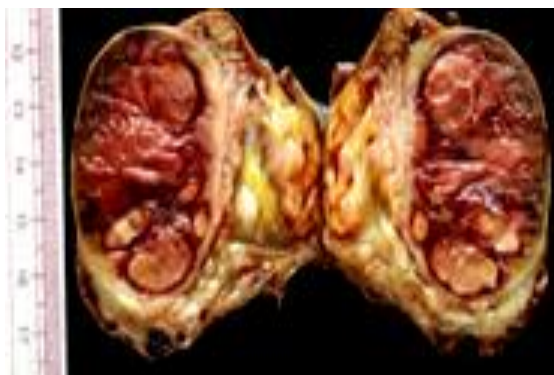


Fig. 5: Gross picture of Seminoma

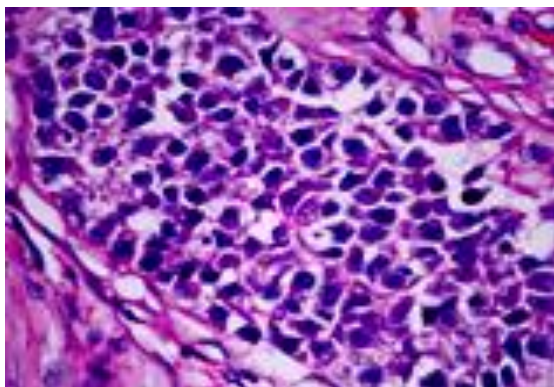


Fig. 6: Micro picture of Seminoma Uniform tumour cells arranged in sheets. H&E, 100X

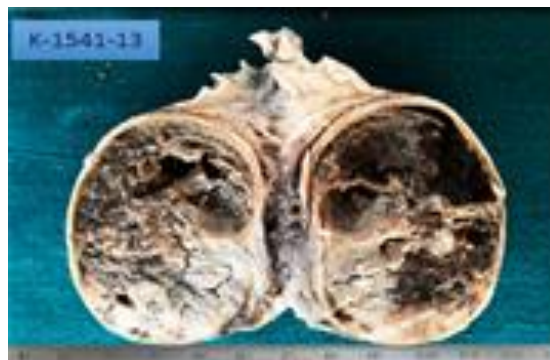


Fig. 7: Gross pic of teratocarcinoma

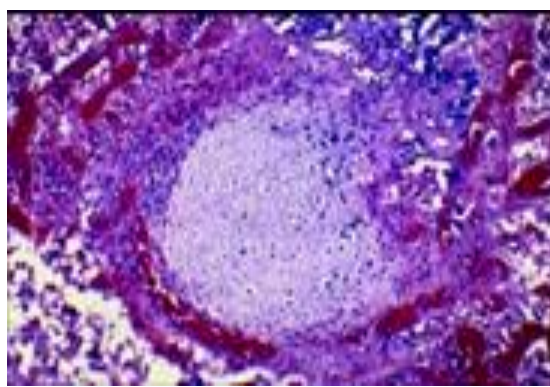


Fig. 8: Micro pic of teratocarcinoma Fragment of cartilage with areas of hemorrhage & necrosis. H&E, 100X

Acknowledgement

We would like to thank the teaching and technical staff of SNMC, Bagalkot and Peripheral centres, Bagalkot. Also we thank our colleagues for their support throughout the work. I would also like to thank my husband Dr Prasad Patil for his encouragement. Thanks to almighty.

References

1. Chaurasia BD. Male Reproductive System. In: Human Anatomy, Volume 2. 6th ed. New Delhi: CBS Publishers and Distributors; 2013.p.266 -296.
2. Juan R. Male reproductive system. In: Rosai and Ackerman's Surgical Pathology, Volume 1. 10th ed. St. Louis: Elsevier; 2011.p.1334-1374.
3. Sabiston. Testis. In: Text book of surgery, volume II. Eighteenth ed. Saunders/ Elsevier Publishers;2007.p.2280-2285.
4. Bergstorm et al. Testicular cancer in nine European countries. Int J Cancer 1996;59:33-38.
5. Kunal S Deore, Mahesh B Patel, Ritesh P Gohil, Kirankumar N Delvadiya, Hansa M Goswami. Histopathological analysis of testicular tumours - a 4 year experience. International Journal of Medical Science and Public Health 2015; Vol 4(4):554-557.
6. Haas GP, Shumaker BP, Cerny JC. High incidence of benign testicular tumours, J urol.1986, Dec;136(6):1219-1220.
7. Kressel K, Schnell D, Thon WF, Heymer B, Hartmann M, Altwein JE. Benign testicular tumors: a case for testis preservation? Eur Urol. 1988;15:200-4.

8. Robertson GS. Radical orchidectomy and benign testicular conditions. *Br J Surg.* 1995. Mar;82(3):342-5.
9. Patel MB, Goswamy HM, Parikh UR, Mehta N. Histopathological study of testicular lesions. *Gujarat Medical Journal* 2015;70(1):41-46.
10. W. Duncan et al. Management of testicular seminoma. *British Journal of cancer;* 1987;55:443-448.
11. Deotra A, Mathur DR, Vyas MC et al. An 18 years study of testicular tumours in Jodhpur, western Rajasthan. *J Post Graduate Med* 1994;40(2):68-70.
12. Srinivasan A, Cinman N, Feber K, Gitlin J, Palmer L. History and physical examination findings predictive of testicular torsion: An attempt to promote clinical diagnosis by house staff. *Journal of Pediatric Urology.* 2011;7(4):470-474.
13. Rizvi SAA, Ahmad I, Siddiqui MA, Zaheer S, Ahmad K. Role of Color Doppler Ultrasonography in Evaluation of Scrotal Swellings. *Urology Journal* 2011;8(1):60-5.
14. Rampaul MS, Hosking SW. Testicular torsion: most delay occurs outside hospital. *Ann R Coll Surg Engl.* 1998 May;80(3):169-72.
15. Kaver I, Matzkin H, Braf ZF. Epididymoorchitis: a retrospective study of 121 patients. *J Fam Pract* 1990;30(5):548-552.
16. Mostofi FK, Price EB, Jr. Tumors of the male genital system. *Atlas of Tumor Pathology, Fascicle 7, Series 2.* Washington, DC: Armed Forces Institute of Pathology, 1973. Pp. 1186–1200.
17. Qaiser S, Naqvi H, Ansari AL, Memon NA, Memon JM, Akhund AA. Correlation of age with histopathological type of testicular tumors. *Gomal Journal of Medical Sciences.* Jan-June, 2006: Vol 4(1).
18. Staiman VR, O'Toole KM, Rubin MA, Lowe FC. Giant malignant fibrous histiocytoma of the testis/spermatic cord: psychologic and possible etiologic complications of unethical Nazi medical experimentation. *Journal Of Urology* 1996 Dec;48(6):939-43.