e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(1); 1356-1362

Original Research Article

A Hospital Based Assessment of the Incidence and Histomorphological Spectrum of Testicular Lesions Including Non-Neoplastic as Well as Neoplastic Lesions

Shambhwi Sharma

Senior Resident, Department of Pathology, AIIMS, Patna, Bihar, India

Received: 19-09-2022 / Revised: 25-10-2022 / Accepted: 14-11-2022

Corresponding author: Dr. Shambhwi Sharma

Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to study the incidence and histomorphological spectrum of testicular lesions including non-neoplastic as well as neoplastic lesions.

Methods: The present study is an observational study, carried out in Department of Pathology,AIIMS, Patna, Bihar, India, over duration of two years. A total of 50 radical orchidectomy and testicular biopsies were studied for gross and microscopic findings. Clinical details like age, laterality, family history, history of risk factors, and serum markers of the patients were recorded from the patient record section of the hospital and by talking to the patients directly wherever possible.

Results: The present study comprised of total 50 cases. 44 orchidectomy specimens and 6 testicular biopsies were studied. Out of these, 40 cases were non neoplastic and 10 were neoplastic. The youngest patient was a 6-month-old male child while the oldest was 78 years old. Maximum number of patients presented in the 2nd & 4th decade of life. Among neoplastic lesions, the youngest patient was 9 years old and oldest was 75 years old. The mean age for non-neoplastic lesions was 33.32 years and for neoplastic lesions was 33.40 years. Clinically, most of the patients presented with scrotal swelling (54%), empty scrotum (40%) pain (36%), fever (12%) and tenderness (8%). Right testis was involved more commonly (31/50;62%) than left testis (19/50;38%). Bilateral testicular involvement was not seen in any of the cases.

Conclusion: Germ cell tumors accounted for highest percentage of cases with a commonest subtype of seminoma followed by mixed germ cell tumors. Histopathologic examination can help in accurately diagnosing and determining the prognosis of these rare tumor and tumor like lesions of testis.

Keywords: Testes, Testicular Lesions, Seminoma, Mixed Germ Cell Tumor.

Introduction

Testicular cancers comprise 1% of all the male cancers worldwide. [1] In developed countries, testicular neoplasm have been noted as most common solid tumor between the 2nd and 4th decade of life. [2,3] Though the etiology of testicular cancer is not well understood, various factors like cryptoorchidism, trauma, infections, genetic and endocrine factors appear to play a role in their development. [4] A definite geographic and racial distribution is seen in testicular tumors.

The age distribution of testicular cancer is also distinct from other cancers.5

The neoplastic lesions constitute 1%–2% of all malignant tumors and have a peaked prevalence at 15 and 35 years; incidence then declined as age increases. [5] The reported trends of testicular tumors in industrialized regions of the world revealed rising rates. [6] A tumor can be germ cell, nongerm cell, or mixed testicular tumor; the risk factors include family history, Klinefelter syndrome, and cryptorchidism. [4] Cryptorchidism which lingers in 1% of the infants in the 1st year of life could be from a short spermatic cord, narrow inguinal canal, trisomy 13, maldevelopment of the scrotum, or deficient androgen secretions. [7] This results in testicular atrophy that could as well develop due to irradiation, hypopituitarism, orchitis, prolonged antiandrogen administration, atherosclerotic narrowing of the blood supply in old age, generalized malnutrition, and exhaustion atrophy. [8]

Testicular lesions have a varied histomorphological spectrum and are largely categorized as non-neoplastic and neoplastic lesions. Non- neoplastic lesions comprise cryptorchid testis, testicular torsion, testicular atrophy, epididymo-orchitis, abcesses, epidermoid cysts, infertility, malakoplakia and vasculitis. Tuberculosis, atypical mycobacteriosis, leprosy, syphilis, sarcoidosis and crohn's disease can also involve testis. 2016 WHO classification of testicular tumors introduced several updates to the previous 2004 classification system. Several entities including germ cell tumors, sex cord-stromal tumors, tumors containing both germ cells and sex-cord stromal cells, a miscellaneous group of testicular tumors and paratesticular tumors were updated in the 2016 classification. [9] Recently there has been a radical revision in the 2016 WHO classification, especially to germ cell tumors. [10] Known risk factors for developing testicular tumor include a family history of testicular tumor in a first degree relative, infertility, cryptorchidism, Klinefelter's syndrome, birth weight, gestational age, inguinal hernia and some uncommon factors like trauma and hormones. [11,12] Thus, a combination of genetic, and environmental factors contributes to the etiology of testicular tumors. Despite advances in radiological and newer techniques in tumor marker assays, histopathological examination of orchidectomy specimens and testicular biopsies, by enlarge, anchor the diagnosis of testicular. [13]

The aim of the present study was to study the incidence of testicular lesions, to study the histomorphological spectrum of testicular lesions including non-neoplastic as well as neoplastic lesions and to determine age-wise distribution, laterality and clinical presentation in testicular lesions.

Materials and Methods

The present study is an observational study, carried out in Department of Pathology,AIIMS, Patna, Bihar, India, over duration of two years. A total of 50 radical orchidectomy and testicular biopsies were studied for gross and microscopic findings. Clinical details like age, laterality, family history, history of risk factors, and serum markers of the patients were recorded from the patient record section of the hospital and by talking to the patients directly wherever possible. All slides and requisition forms were reviewed and the clinical details, macroscopic and microscopic details were analyzed and different parameters like percentage, mean were calculated using SPSS software.

Inclusion criteria

All tumors and tumor like lesions of the testes were included in the study and were categorised according to the 2016 WHO classification of testicular tumors.

Exclusion criteria

Therapeutic orchidectomies for prostate cancer, recurrent tumors and tumors occurring secondary to radiation induced damage were excluded from the study.

Results

Table 1: Showing age-wise distribution of various non-neoplastic testicular lesions

Tumor type-lesion	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Undescended testis	1	5	2	2	4	1	0	0	15
Torsion	0	2	1	3	4	1	0	1	12
Atrophic testis	0	2	0	1	1	0	1	0	5
Epididymo-orchitis	0	1	1	1	0	0	0	0	3
Tubercular epididymo-orchitis	0	1	0	0	0	0	0	0	1
Organized abcess	0	1	1	0	0	0	0	0	2
Calcinosis cutis	0	0	0	1	0	0	0	0	1
Trauma	0	0	0	1	0	0	0	0	1
Total	1	12	5	9	9	2	1	1	40

Table 2: Showing age-wise distribution of various neoplastic testicular lesions

Tumor type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Seminoma	0	0	1	3	1	0	0	0	5
MGCT									
Seminoma+ YST+Mature teratoma	0	0	1	0	0	0	0	0	1
Immature teratoma+ Embryonal Ca	0	0	1	0	0	0	0	0	1
YST	1	0	0	0	0	0	0	0	1
NHL	0	0	0	0	0	0	0	2	2
Total	1	0	3	3	1	0	0	2	10

The present study comprised of total 50 cases. 44 orchidectomy specimens and 6 testicular biopsies were studied. Out of these, 40 cases were non neoplastic and 10 were neoplastic. The youngest patient was a 6-month-old male child while the oldest was 78 years old. Maximum number of patients presented in the 2nd & 4th decade of life. Among neoplastic lesions, the youngest patient was 9 years old and oldest was 75 years old. The mean age for non-neoplastic lesions was 33.32 years and for neoplastic lesions was 33.40 years. (Table 1 and 2)

Table 3: Clinical characteristics

Clinical characteristics	N%
Scrotal swelling	27 (54)
Empty scrotum	20 (40)
Pain	18 (36)
Fever	6 (12)
Tenderness	4 (8)
Testis involved	
Right	31 (62)
Left	19 (38)

Clinically, most of the patients presented with scrotal swelling (54%), empty scrotum (40%) pain (36%), fever (12%) and tenderness (8%). Right testis was involved more commonly (31/50;62%) than left testis (19/50;38%). Bilateral testicular involvement was not seen in any of the cases.

Table 4: Showing distribution of testicular tumors and tumor like lesions

Tumor Type	N	%
Seminoma	5	50
MGCT	2	20
YST	1	10
NHL	2	20
Total	10	100
Tumor like lesions		
Undescended testis	15	37.5
Torsion	12	30
Atrophic testis	5	12.5
Epididymo-orchitis	3	7.5
Tubercular epididymo-orchitis	1	2.5
Organized abcess	2	5
Calcinosis cutis	1	2.5
Trauma	1	2.5
Total	40	100

Among neoplastic lesions (10/50;20%), in the present study, 8(80%) were germ cell neoplasms, 2;(20%) were NHL. Histologically, among non-neoplastic testicular lesions (40/50;80%), undescended testis was the most common diagnosis (15/40;37.5%), followed by testicular torsion (12/40;30%). Undescended testis and testicular torsion thus constituted most of the non-neoplastic testicular lesions (27/40;67.5%). Atrophic testis was found in 5/40(12.5%) cases in the present study. Inflammatory lesions included non-specific epididymo-orchitis, tubercular epididymo-orchitis and organised abcess comprising 3/40 (7.5%), 1/40(2.5%) and 2/40(5%) cases. Single case (1/40;2.5%) of calcinosis cutis was also found in the present study along with a single case of testicular trauma (1/40;2.5%).

Discussion

The differences in the epidemiological distribution of testicular disorders are tied to demographic traits. These disorders can be neoplastic or nonneoplastic. [14] Though the incidence of testicular tumor is low, it is one of the most common malignancies occurring in young adults. In present study, most of the malignant cases

were seen in 3rd and 4th decade of life which was in accordance with reports from African and European series. [15,16]

According to the literature, the histologic pattern and behavior of the tumor differ with each age period. 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. Our study was also an attempt to do so. In the present study, 20% lesions turned out to be malignant and 80% were benign. This was in concordance to the studies done by Reddy H et al, Patel MB et al and Sharma et al. [17-19]

Right sided testis was more commonly involved in the present study. Similar findings were seen in Patel MB's and Sharma M's studies'. [18,19] However, similar was not the case in the study done by Reddy H et al. [17] cryptorchidism was the most common (15/40;37.5%) non-neoplastic lesion in the present study, followed by testicular torsion (12/40;30%). Our findings were similar to study done by Sharma et al. 4 However, these findings were not comparable with the previous studies [17,18,20] where torsion was the most common non-neoplastic lesion. Cryptorchidism is the single most important risk factor associated with testicular cancer with 10% of all testicular cancer patients having history of cryptorchidism. Although we found 15 cases of undescended testis, none of them showed neoplastic focus and also none of the cases of testicular neoplasms had history of undescended testis. Our finding is in concordance with Reddy H et al and Sharma et al. [17,19] The incidence of non-neoplastic lesions was higher in the 2nd decade of life in the present study. This was in comparison to the study done by Sharma et al [19] but was not comparable with the results given by Reddy et al. and Abdulkadir et al. [17.21] These variations could be because of demographic reasons and because of the vast histopathological spectrum of benign lesions of testicular origin.

Similar to the previous studies, testicular tumors were rare in the present study as well. Incidence of neoplastic testicular lesions was 20% in the present study. Most of the neoplastic lesions were seen in the 3rd and 4th decade of life, which was similar to the findings of various studies. 10,16 Mostofi and Price 17 described that germ cell tumors constitute more than 94% and stromal tumors consist of 3% of testicular tumors. In the present study, germ cell tumors formed the main bulk, representing about 80% of all testicular cancers. This was in concordance to the study done by various authors, [17,19,22] however no stromal tumors were reported in the present study.

Seminoma was the most common histological type encountered in the present study (5/10,50%) with mean age of 37.6 years. This was in comparison to the study done by Sanjay M et al and Chakrabarti et al. [23,24] Pratap VK et al. and Reddy et al reported mean age of 41.25 years and 40 years respectively. [19,25] 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. In the present study as well, seminoma was seen most commonly in the 4th decade. [26] Among non- seminomatous germ cell tumors, 2 mixed germ cell tumors (20%) and 1 Yolk Sac tumor (10%) were reported in the present study, with mean age of 17.33 years, which was in close comparison to the findings of Sanjay M et al.[23] Embryonal carcinoma and teratoma are more frequently encountered combination of mixed germ cell tumors constituting about 24% of all testicular tumors. In the present study, we reported 1 case having a mixture embryonal carcinoma and teratoma while other

combination found was of teratoma with YST and Seminoma. Non- seminomatous tumours are known to present in younger age than seminomatous type, which was the case in the present study. The youngest patient with neoplastic lesion, in the present study, was diagnosed yolk sac tumor, was 9 years old.

Conclusion

Germ cell tumors accounted for highest percentage of cases with a commonest subtype of seminoma followed by mixed germ cell tumors. Patients diagnosed with testicular tumors were mostly in 3rd and 4th decade. Right side laterality was prevalent. Testicular tumors and tumor like lesions have similar presentation in the form of scrotal swelling and pain. The incidence of testicular neoplasm still remains low in India which is reflected by the scarcity of studies in published literature. Histopathologic examination can help in accurately diagnosing and determining the prognosis of these rare tumor and tumor like lesions of testis.

References

1. Purdue MP, Devesa SS, Sigurdson AJ, McGlynn KA. International patterns and trends in testis cancer incidence. International journal of cancer. 2005 Jul 10;115(5):822-7.
2. Power DA, Brown RS, Brock CS, Payne HA, Majeed A, Babb P. Trends in testicular carcinoma in England and Wales, 1971–99. BJU international. 2001 Mar;87(4):361-5.
3. Muir CS. Epidemiology of cancer of the testis and penis. J NCI Monogr. 1979; 53:157-64.
4. Garner MJ, Turner MC, Ghadirian P, Krewski D. Epidemiology of testicular cancer: an overview. International journal of cancer. 2005 Sep 1;116(3): 331-9.
5. Liu S, Wen SW, Mao Y, Mery L, Rouleau J. Birth cohort effects underlying the increasing testicular cancer incidence in Canada. Canadian journal of public health. 1999 May; 90: 176-80.
6. Alhaji SA, Abdulkadir A, Sanusi HM. A 15-year pathologic review of testicular and para-testicular tumours in Kano, Northern Nigeria. Nigerian Journal of Basic and Clinical Sciences. 2016 Jul 1;13(2):114.
7. Mathers MJ, Sperling H, Rübben H, Roth S. The undescended testis: diagnosis, treatment and long-term consequences. Deutsches Ärzteblatt International. 2009 Aug;106(33):527.
8. Chan PT, Schlegel PN. Diagnostic and therapeutic testis biopsy. Current Urology Reports. 2000 Dec;1(4):266-72.
9. Al-Obaidy KI, Idrees MT, Muhammad T. Testicular Tumors: A Contemporary Update on Morphologic, Immunohistochemical and Molecular Features. Adv Anat Pathol. 2021;28 (4):258–75.
10. Moch H, Amin MB, Berney DM, Compérat EM, Gill AJ, Hartmann A, et al. The 2022 World Health Organization Classification of Tumours of the Urinary System and Male Genital Organs-Part A: Renal, Penile, and Testicular Tumours. Eur Urol. 2022;82(5):458–68.
11. Assi T, Rassy M, Nassereddine H, Sader-Ghorra C, Abadjian G, Ghosn M, et al. Distribution of Testicular Tumors in Lebanon: A Single Institution Overview. Asian Pac J Cancer Prev. 2015;16(8):3443–6.
12. Chakrabarti PR, Dosi S, Varma A, Kiyawat P, Khare G, Matreja S. Histopathological Trends of Testicular Neoplasm. J Clin Diagn Res. 2016;10(6):16–8.
13. Sharma M, Mahajan V, Suri J, Kaul K. Histopathological spectrum of testicular lesions- A retrospective study. Indian J Pathol Oncol. 2017; 4 (3):437–41.
14. Rosai J. Male reproductive system. In: Rosai and Ackerman's Surgical

Pathology. 10th ed. Vol. 1. New York: Elsevier; 2011. p. 1335-6.
15. Sagalowsky AI. Current considerations in the diagnosis and initial treatment of testicular cancer. Comprehensive therapy. 1994 Dec 1;20(12):688-94.
16. Richiardi L, Bellocco R, Adami HO, Torrång A, Barlow L, Hakulinen T, Rahu M, Stengrevics A, Storm H, Tretli S, Kurtinaitis J. Testicular cancer incidence in eight northern European countries: secular and recent trends. Cancer Epidemiology Biomarkers & Prevention. 2004 Dec;13(12):2157-66.
17. Reddy H, Chawda H, Dombale VD. Histomorphological analysis of testicular lesions. Indian J Pathol Oncol. 2016;3(4):558–63.
18. Patel MB, Goswamy HM, Parikh UR, Mehta N. Histopathological study of testicular lesions. Gujarat Medical Journal. 2015; 70:41–6.
19. Sharma M, Mahajan V, Suri J, Kaul KK. Histopathological spectrum of testicular lesions- A retrospective study. Indian J Pathol Oncol. 2017;4 (3):437–41.
20. Abba K, Tahir MB, Dogo HM, Nggada HA. Testicular and Paratesticular Non-Neoplastic lesions in University of Maiduguri Teaching Hospital: A 10-year Retrospective Review. Bo Med J. 2016;13(1):39–44.
21. Abdulkadir A, Sanusi HM, Alhaji SA. Histopathological pattern of testicular lesions in Kano, Northwestern Nigeria. Niger J Surg. 2019;25(2):158–62.
22. Assi T, Rassy M, Nassereddine H, Sader-Ghorra C, Abadjian G, Ghosn M, Kattan J. Distribution of testicular tumors in Lebanon: a single institution overview. Asian Pacific Journal of Cancer Prevention. 2015;16(8):3443-6.
23. Sanjay M, Sushma HM. Histomorphological spectrum of tumor and tumor like lesions of testis and paratesticular structures - A cross sectional study. Indian J Pathol Oncol. 2016;3(4):528–34.
24. Chakrabarti PR, Dosi S, Varma A, Kiyawat P, Khare G. Histopathological Trends of Testicular Neoplasm: An Experience over a Decade in a Tertiary Care Centre in the Malwa Belt of Central India. J Clin Diagn Res. 2016; 10(6):16–8.
25. Pratap VK, Agarwal S. Testicular neoplasm. Indian J Cancer. 1971; 40 – 53.
26. Berthelot M., Rieker A., & Correia J. C. The difficulties experienced by patients with low back pain in France: a mixed methods study. Journal of Medical Research and Health Sciences. 2022; 5(6): 2039–2048.