

Original Article

Testicular Disease: A Clinico-Pathological Report from a Nigerian Tertiary Health Center

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Abstract

Background: The testes are the male reproductive glands and the homolog of the ovary in females performing critical functions. Pathologic conditions could arise from the testes and blunt or completely obliterate these functions leading to clinically overt or covert sequelae. The aim of this research is to study the pattern of histologically diagnosed testicular disease in relation to clinical features at the Jos University Teaching Hospital between January 2012 and December 31st, 2021.

Methodology: This study is a retrospective analysis of all cases of testicular biopsies. All histologically diagnosed testicular lesions were identified from the departmental records and clinical data obtained further from the patients' folder at the Medical Records Department.

Results: Four hundred and thirty (430) biopsies were seen, of which 304 (70.7%) were orchidectomy specimens. The commonest histological diagnosis was testicular atrophy accounting for 328(76.3%) cases. Testicular torsion is followed by 42(9.8%) cases. Together, inflammatory conditions accounted for 36(8.4%) cases out of which granulomatous inflammation made up 52.3% of cases. There were 16(3.7%) neoplastic conditions all of which were malignant, out of which 6(37.5%) were seminomas. The age range, mean, median and modal age was 1-90 years, 53.4 +21.3years, 60 years and 70 years respectively. Prostatic carcinoma therapy in the form of bilateral orchidectomy was the major indication for surgery.

Conclusion: The majority of testicular lesions in our locality are atrophies and most of these lesions are obtained as orchidectomies for therapy of prostatic cancer.

Keywords: Testes; Atrophy; Torsion; Prostate; Granuloma.

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Introduction

The testes are the male reproductive glands, homologs of the ovary in females. These bean shaped organs are situated within the scrotal sac, a location suited for the all-important functions which are essentially reproductive.^[1,2] To perform this crucial function, a regulated environment (scrotum) external to the main body with temperature (35°C) less than that of core body temperature (37°C) is mandatory.^[3,4] Pathologic conditions of the testes could lead to clinically overt or covert sequelae.^[5] The aim of this study is to establish the clinicopathologic pattern of testicular lesions at the Jos University Teaching Hospital.

Methodology

This study is a retrospective analysis of all cases of testicular biopsies received at the Anatomical Pathology and Forensic Medicine Department of the Jos University Teaching Hospital between 1st January 2012 and December 31st, 2022. All histologically diagnosed testicular lesions were identified from the departmental records and clinical data obtained further from patients' folder at the Medical Records Department. Archival histological slides for each case were reviewed independently by two anatomical pathologists with further harmonization in a joint session of the few areas of variation. Cases of missing or broken slides were addressed by making new slides from archival tissue blocks. All cases with definitive histological diagnosis were included. All cases with inadequate clinical information, missing archival slides and tissue blocks were excluded. The data realized were analyzed using 2016 Microsoft Excel software and presented in tables as simple frequencies, percentages, range, and measures of central tendencies.

Result

Four hundred and thirty (430) of the 441 biopsies were included in the study. Of these, 304 (70.7%) were orchidectomy specimens. Of these orchidectomies, 250(82.2%) were bilateral. The commonest histological diagnosis was testicular atrophy accounting for 328(76.3%) cases. (Table 1). Testicular torsion followed with 42(9.8%) cases. Together, inflammatory conditions accounted for 36(8.4%) cases out of which granulomatous inflammation made up 52.3% of cases. There were 16(3.7%) neoplastic conditions all of which were malignant, out of which 6(37.5%) were seminomas. (Table 1). The age range of the distribution was 1-90years while the mean, median and modal age were 53.4 +21.3years, 60years and 70years respectively. (Table 2). There were 175(40.7%) and 255(59.3%) cases before and after age 50 years respectively. (Table 2). Prostatic carcinoma therapy in the form of bilateral orchidectomy was the indication of 249 cases. (Table 3). Testicular mass and infertility were seen in 94 and 70 cases respectively. (Table 3).

Table 1: Distribution of histologically diagnosed testicular lesions according to age.

DIAGNOSIS	AGE (Years)										TOTAL
	<10	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
Atrophy	5	2	14	44	29	28	78	101	26	1	328(76.3)
Torsion/infarction	-	16	12	7	5	-	2	-	-	-	42(9.8)
Acute inflammation	-	-	1	-	-	-	-	1	1	-	3(0.7)
Chronic inflammation	-	-	2	3	4	1	1	2	1	-	14(3.3)
Granulomatous inflammation	-	-	6	3	2	1	2	3	2	-	19(4.4)
Simple cyst	-	1	3	2	1	-	1	-	-	-	8(1.8)
Seminoma	-	-	-	4	1	1	-	-	-	-	6(1.3)

Seminomatous Seminoma	-	-	-	-	-	-	1	-	-	-	1 (0.2)
Sertoli cell tumor	-	-	-	1	-	-	-	-	-	-	1(0.2)
Embryonal carcinoma	-	-	-	-	1	-	-	-	-	-	1(0.2)
Yolk sac tumor	1	-	-	-	-	-	-	-	-	-	1(0.2)
Matured teratoma	1	-	-	-	-	-	-	-	-	-	1 (0.2)
Lymphoma	1	-	-	-	-	-	-	-	1	-	2(0.5)
Rhabdomyosarcoma	-	3	-	-	-	-	-	-	-	-	3(0.7)
TOTAL	8(1.8)	22(5.1)	38(8.8)	64(14.9)	43(10.0)	31(7.2)	85(19.8)	107(24.9)	31(7.2)	1(0.2)	430(100.0)

Table 2: Distribution of histologically diagnosed testicular lesions according to measures of central tendency for age.

DIAGNOSIS	MEASURES OF CENTRAL TENDENCY (AGE)			
	Range	Mean	Median	mode
Atrophy	20-65	16.3 \pm 16.3	65.0	70.0
Infarction	10-62	23.9 \pm 11.8	20.0	16.0
Acute inflammation	3-82	21.6 \pm 13.7	70.0	4.0
Chronic inflammation	21-83	47.8 \pm 18.7	45.0	45.0
Granulomatous inflammation	20-85	47.5 \pm 22.5	40.0	20.0
Simple cyst	16-67	36.4 \pm 15.8	33.5	27.0
Seminoma	35-55	40.8 \pm 7.4	38.5	35.0
Seminomatous Seminoma	65	65	65	65
Sertoli cell tumor	30	30	30	30
Embryonal carcinoma	1.0	1.0	1.0	1.0
Yolk sac tumor	1	1	1	1
Matured teratoma	4	4	4	4
Lymphoma	8-80	44.0 \pm 50.9	44.0	NA
Rhabdomyosarcoma	12-17	14.7 \pm 2.5	15.0	12.0
TOTAL	1-90	53.4 \pm 21.3	60	70

Table 3: Distribution of histologically diagnosed testicular lesions according to symptoms/indication for surgery.

DIAGNOSIS	INDICATION FOR SURGERY/SYMPTOMS				
	Prostate Cancer	Mass	Pain	Undescended	Infertility
Atrophy	249	-	-	17	70
Torsion	-	35	40	-	-
Acute inflammation	-	3	3	-	-
Chronic inflammation	-	13	13	-	-
Granulomatous inflammation	-	19	4	-	-
Simple cyst	-	8	5	-	-
Seminoma	-	6	-	-	-
Seminomatous Seminoma	-	1	-	-	-
Sertoli cell tumor	-	1	-	-	-
Embryonal carcinoma	-	1	-	-	-
Yolk sac tumor	-	1	-	-	-
Matured teratoma	-	1	-	-	-
Lymphoma	-	2	-	-	-
Rhabdomyosarcoma	-	3	-	-	-
TOTAL	249(57.9%)	94(21.9%)	65(15.1%)	17(4.0%)	70(16.3%)

Discussion

Testicular atrophy, the commonest histological diagnosis seen in this study is shown herein not to be in itself a disease. This is because the vast majority (249, 75.9%) of this histological entity are orchidectomy samples from otherwise normal patients treated with bilateral orchidectomy for prostate cancer. In Africa, hormone deprivation therapy by way of bilateral orchidectomy is the commonest modality for treatment of patients with advanced prostate cancer with or without anti-androgen drugs.^[7,8] With a rising incidence of prostate cancer and a growing proportion of patients in our locality, treatment with bilateral orchidectomy is a veritable option.^[8] As a consequence of harsh economic realities, this therapeutic option is expected to experience a renaissance in pockets of places in our clime where it has been substituted with other treatment modalities.^[9] The advantages of bilateral orchidectomy as a therapeutic measure for prostate cancer include: persistent oncological effectiveness and disease control with low testosterone level; absent psychological perturbations; better health-related quality of life (HRQoL) and overall health status.^[9,10] A study showed surgical castration for therapy of prostate cancer constituting 57.8% of all testicular biopsies.^[11]

Another important entity contributing to testicular atrophy in this study is cryptorchidism. It variably differs in consequence from outright infertility arising because of testicular atrophy which is the second commonest indication for testicular biopsy with a diagnosis of atrophy in this study. Cryptorchid testis can be salvaged from damage depending on the severity of the atrophy.^[12] This is possible with surgical intervention after calculating the testicular atrophy index (TAI), the ratio expressed in percentage of the difference between the volume of the normal (contralateral) testis and affected testis, to the volume of the normal (contralateral) testis.^[12] A TAI value of equal or greater than 20% is an indication for surgery as it implies better outcome.^[12] In a study involving 1029 infertile men, it was found inter alia that bilateral testicular atrophy translates to lowest sperm count and motility, with a significant correlation between testicular volume and spermatogenesis.^[13] Also testicular volume was considered a reliable indicator of testicular function.^[13] The

Emmanuel I, et al -Testicular Disease: A Clinico-Pathological Report finding in this work of undescended testes responsible for 4.% of all histologically diagnosed testicular biopsies is in agreement with several reports in which values of 3.75%-6.67% recorded.^[11,14,15,16,17,18]

Testicular atrophy is graded with severity from mild, moderate to severe with consequences on fertility of the male. The process progresses in severity from the initial maturation arrest represented as partial or complete loss of spermatids within the seminiferous tubules; through hypoplasia of all maturing germ cells with vacuolation of these germ cells and presence of giant cells; to the severe stage where there is total loss of germ cells, Sertoli cell hyperplasia ('Sertoli-only' features), shrunken seminiferous tubules wall with thickened basement membrane and in advance cases complete sclerotic testicular parenchyma.^[19]

Inflammatory conditions were second to testicular atrophy in this study, with granulomatous inflammation leading in frequency. Although the causes of granulomatous orchitis are rife, they could be broadly categorized into specific and non-specific (idiopathic).^[20] This study however did not work towards unravelling the etiology of the granulomas. Kahn et al. reported mycobacterium tuberculosis as the commonest cause of granulomatous orchitis in a retrospective analysis of 17 cases.^[20] Perimenis et al. reported 7 cases of idiopathic cases of granulomatous orchitis.^[21] As at 2001 only 20 cases of granulomatous orchitis were reported in Japan giving credence to the rarity of this pathological entity.^[22] Owing to the difficulty of presurgical diagnosis due to its similarity with cancer, the majority of cases of granulomatous orchitis are diagnosed histologically after orchidectomy.^[21,22,23] Furthermore, orchidectomy is a preferred therapeutic option as late presentation in most cases has incurred irreparable damage that antibiotics cannot salvage at the time of clinical assessment.^[16] Similar to this study, chronic granulomatous inflammation was the commonest inflammatory lesion in a study by Oranusi et al when isolated from other inflammatory conditions,^[16] but second in a study by Baidya et al.^[18]

Testicular torsion represented histologically as red infarct is the second commonest histological entity in this study. As seen in this study it presents symptomatically with testicular swelling and pain.^[24,25] It is clinically a common, genuine time sensitive urological emergency that if not halted will slide down the slippery slope leading to coagulative necrosis (infarct), subfertility and infertility.^[24,25] Several studies have put forth different red lines regarding intervention up to 24hours according to researchers' findings, the rubicon however is widely reported as the 8-hour mark where most testicles with torsion without intervention are unsalvageable.^[24,25] These unsalvageable testicles must therefore be removed as a final option.^[26] The decision for orchidectomy is one that is however rife with litigations as patients probe malpractice hinged on delay in instituting treatment.^[24] In this study, we found testicular torsion to constitute 9.8% of all biopsies studied. Other studies reported 6.3% (Nwafor et al),^[11] 10.0% (Tekumalla et al),^[14] 7.3% (Abdulkadir et al),^[15] 14.8% (Oranusi et al),^[16] 19.0% (Reddy et al),^[27] 23.2% (Albasri et al),^[17] and 46.7% (Baidya et al).^[18] The reason for this wide variation is likely due to sampling methods. For instance, our study was on all testicular samples while some other studies were done on orchidectomy alone.^[14,27]

Neoplastic testicular diseases were all malignant cases in this study and constituted 3.7% of all cases of testicular disease. A range of 5.6% to 25% of neoplastic lesions was seen in previous studies reviewed.^[11,14,16,17,18,28] Generally testicular malignancies are rare. Two previous studies in our center found that testicular malignancies were amongst the rarest cancers. In this study, seminoma was the most common malignant testicular neoplasm, a finding that is in agreement with many reports.^[14,16,18,19]

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