HISTOPATHOLOGIC PATTERN OF NEOPLASTIC TESTICULAR AND PARATESTICULAR LESIONS IN UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL: A 10-YEAR RETROSPECTIVE REVIEW.

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ABSTRACT

OBJECTIVE: The present study is undertaken to describe the spectrum of histopathological features and age distribution of neoplastic testicular and paratesticular lesions in the University of Maiduguri Teaching Hospital.

MATERIALS AND METHODS: A retrospective descriptive study of 14 testicular and paratesticular neoplastic lesions was conducted over a period of 10 years; between January-2005 and December-2014 in the Department of Histopathology, University of Maiduguri Teaching Hospital. Histopathological examination was done after routine processing and staining with Haematoxylin & Eosin.

RESULTS: There were 14 cases of neoplastic testicular and paratesticular tumours of which 12cases (85.7%) were malignant lesions and 2 (14.3%) were benign. There were 7 cases (50.0%) of testicular germ cell tumours, 4 cases (28.6%) of paratesticular tumoursand 3 cases (21.4%) of metastasis to the testis. The testicular germ cell tumours also accounted for 100% of all primary testicular tumours. These included 3 cases (42.9%) of seminoma and teratoma each and a case (14.3%) of endodermal sinus tumour (yolk sac tumour). The age distribution of the testicular and paratesticular tumours in this study shows that the majority of malignant lesions were present in the third and sixth decades of life (66.6%), while the only two benign lesions have also one case each in the third and sixth decades of life. The study also shows thatonly 2 cases were seen in the second decade of life; a case of seminoma in a 14-year-old boy and rhabdomyosarcoma in 15 years old, while the oldest patient was a 61-year-old male whose diagnosis was yolk sac tumour.

CONCLUSION: This study highlights the rarity of testicular tumours in Maiduguri, Northeastern Nigeria and correlates well with the histopathological spectrum of testicular tumours in other parts of the world. The relative higher percentage of up 21.4% of cases of metastasis to the testis also emphasizes the need for thorough evaluation of testicular specimens especially in cases of advanced carcinoma of the prostate.

KEYWORDS: testicular, neoplastic lesions, histopathology

NigerJMed2016: 330-335

INTRODUCTION

Tumours of the testis and paratesticular structures are rare; however, they constitute the most common solid malignancies in males aged between 15 and 35years[1]. The incidence of testicular germ cell tumour peaks in young adulthood[2]. Eighty-four percent of testicular germ cell tumour occurs among men between the ages of 15 and 44 years, 15% occurs in men aged 45 years and older, while only 1% occurs in boys less than 15 years of age[2]. Malignant neoplasms arising in the paratesticular region represent only 7.0% of malignant tumours presenting as a scrotal mass[3]. The incidence of testicular tumours in the western countries has been rising in the last few decades[4]. However, it is particularly rare in Africa and black population of other continents[5]. The risk factors for the development of the testicular germ cell tumours are congenital malformation of the male genitalia, family history of testicular tumours, prenatal risk factors, nonspecific and specific exposures in childhood and male infertility[6,7].

There is scarcity of study on testicular and paratesticular tumours in Northern Nigeria especially in our environment and therefore this may be a source of data and reference of histopathological study.

MATERIALS AND METHODS

This is a retrospective descriptive study carried out on14 neoplastic testicular and paratesticular lesions diagnosed in the Department of Histopathology of the University of Maiduguri Teaching Hospital (UMTH) between January 2005 and December 2014. The patients' clinical data which included age, nature of

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specimen submitted and the clinical and histopathological diagnoses were obtained from the request forms and case notes. The results are displayed in frequency tables and analysed by simple statistical methods.

ETHICAL CONSIDERATION

The study protocol was reviewed and approved by the Research and Ethics Committee of UMTH and confidentiality will be maintained.

RESULTS

A total of 202 cases of testicular and paratesticular biopsies; out of which 14(6.9%) cases were neoplastic testicular and paratesticular tumours diagnosed in the Department of Histopathology of the UMTH between January 2005 and December 2014. Their ages range from 14 to 61 years with a median age of 37.5 years.

Twelve (85.7%) out of the 14 cases were malignant lesions and two (14.3%) were benign lesions as shown in table 1.

The commonest tumour was germ cell tumour which accounted for 7(50.0%) of all the neoplastic testicular and paratesticular tumours. The testicular germ cell tumour also accounted for 100% of all primary testicular tumours.This included: 3 cases of seminoma and teratoma each and a case of endodermal sinus tumour (yolk sac tumour). Out of the 3 cases of seminoma (42.9% of testicular germ cell tumours), 2 cases (66.7%) were classic seminoma while the other one (33.3%) was spermatocytic seminoma.

There were four (4) cases of paratesticular tumours which accounted for 28.6 % of all testicular and paratesticular neoplastic lesions; two (2) cases were Rhabdomyosarcoma and one case of malignant fibrous tumour and adenomatoid tumour each. Three (21.4%)cases of the testicular and paratesticular neoplastic lesions were metastatic adenocarcinoma from the prostate.

Table 1 showed age-wise distribution of the neoplastic lesions. Our youngest patient was 14 years old while the oldest was a 61-year-old male. The majority of malignant lesions were present in third and sixth decades of life (66.6%), while the only two benign lesions have one case each in the third and sixth decades of life.

DISCUSSION

Testicular and paratesticular tumours are rare among Africans and likewise in Maiduguri. Studies in various centres in Nigeria such as by Izegbu et al[4] in Ilorin documented 8 cases of testicular malignancies in 10 years; Ugwumba and Aghaji[8] in Enugu reported 24 cases of testicular cancers in two decades, and Seleye-Fubara et al[5] in Port Harcourt, documented 12 cases of testicular tumours in 10 years. This study in Maiduguri also documented 14 cases of testicular and paratesticular tumours in 10 years; this shows the rarity of the tumour in our environment. The annual frequency of the testicular and paratesticular tumour is 1-2 per annum.

The age distribution of the testicular tumours in this study shows that only 2 cases are seen in the second decades of life, a case of seminoma in a 14-year-old boy and rhabdomyosarcoma in 15 years old. The malignant tumours which accounted for twelve cases (85.7%) are more common than the benign lesions (14.3%) and occurred mostly in the third and sixth decades of life.

Germ cell malignancies are the commonest tumours, with three cases of seminoma representing 42.9% of all cases of testicular germ cell tumours. Germ cell tumours can be subdivided into seminoma and non-seminomatous germ cell tumours, which consist of embryonal cell carcinoma, choriocarcinoma, yolk sac tumour, and teratoma. This classification is mostly based on distinctive clinical features, therapy and prognosis[9]. Neoplasms that contain more than one tumour cell components, e.g. seminoma and embryonal cell carcinoma, are referred to as mixed germ cell tumors[9]. It has been shown that the vast majority of testicular cancers are germ cell tumors accounting for nearly 98% of all primary testicular tumours; and among the testicular germ cell tumors, approximately 55.7% are seminomas, 44% are nonseminomas, and 1% are spermatocytic seminomas[2].

Several studies have reported that germ cell tumours are the commonest testicular malignancies with seminomas dominating the list[1, 2, 5, 6, 10, 11, 12]. Seminoma, the malignant testicular tumour of germ cells (the precursors of sperms) is the most frequent carcinoma of the testicle and constitutes 55.7% to 65% of germ cell neoplasia[2, 13]. Three types of pure seminoma have been described: classic, anaplastic and spermatocytic[13]. We recorded three cases of seminoma in the 10 to 39-year age groups which accounted for 42.9% of all cases of testicular germ cell tumours; among which two cases are classic seminoma and one spermatocytic seminoma. The result of this study is similar to the ones obtained by Patel et al[6].

Pure form of yolk sac tumour (endodermal sinus tumour) of the testis in adults is extremely rare. It is primarily a tumour of infants and young children, whereas in adult form it is the component of a mixed germ cell tumors in 2.4% of adult patients[7,14,15]. Yolk sac tumour is characterized by a variety of patterns that

recapitulate the embryonal yolk sac, allantois and extraembryonic mesenchyme. However, the hallmark of the tumour is the Schiller Duval body; characterized by a central core of thin-walled blood vessels lined by a layer of cuboidal cells with clear cytoplasm and prominent nucleoli[14]. We reported a case of adult yolk sac tumour in a 61-year-old patient in our 10 years retrospective study. Patel et al[6] and Seleye-Fubara et al[5] reported 1 and 2 cases of yolk sac tumour respectively.

Testicular teratoma is a sub-type of non-seminomatous germ cell tumours and often occurs in two distinct age groups: pre and post-pubertal testicular teratomas[16]. Mature pre-pubertal teratomas are benign and composed of well differentiated elements of at least two germ cells, and represent approximately 30% of testicular germ cell tumours in children. Adult testicular teratomas are often mixed and are malignant characterized by incompletely differentiated elements similar to foetal or embryonic tissue[16]. Testicular pure teratoma in adults is relatively rare malignant tumour with the ability to invade and metastasize, and accounts for 2.7% to 3% of all germ cell tumours[17, 18]. In our study, there are two cases of immature teratoma documented in two young adult patients aged 20 and 24 years, and a case of mature teratoma in a 50-year-old male. The occurrence of immature teratoma commonly in adults as noted above and reported in this study, is also documented by Zheng et al[10] and Porcaro et al[17] with similar age groups. The reported case in this study of mature teratoma in a 50-year-old male may seem at variance with most studies, however, there are few studies that reported mature teratoma in adults. Zhang et al[19]reported 25 apparently benign postpubertal testicular teratomas, including 10 cases of dermoid cyst and 15 of nondermoid teratomas, which occurred in 25 patients, 12 to 59 years of age (mean 24 y). Ulbright et al[20]were able to differentiate postpubertal testicular dermoid cyst from mature teratoma in their study. Abad et al[21] also reported a case of testicular mature cystic teratoma in a 53-year-old patient. Maizlin et al[22] in their study concluded that, although there was considerable overlapping of the sonographic appearances of teratomas and epidermoid cysts of the testis, the two could be differentiated histologically.

Paratesticular rhabdomyosarcoma is a rare intrascrotal mesenchymal tumour that is localized in paratesticular tissues such as the epididymis, spermatic cord and testicular tunics[23, 24, 25]. It represents only 7% of all patients entered in the Intergroup Rhabdomyosarcoma Study (IRS) and 17% of all malignant intrascrotal tumors in children and adolescent, presenting as a unilateral, painless scrotal mass[23, 24, 26, 27]. Embryonal rhabdomyosarcoma is the predominant histological subtype in 84% to 90% of paratesticular rhabdomyosarcomas, whereas alveolar and spindle cells are less frequent accounting for 8% and 5% respectively[24,25,26]. We recorded two cases of paratesticular embryonal rhabdomyosarcoma presented as unilateral scrotal mass in two patients aged 15 years and 23 years old.

Malignant fibrous histiocytoma (MFH) is the most commonly diagnosed subtype of soft tissue sarcoma, and was first reported in 1964 by O'Brien and Stout[28, 29]. It arises mainly in the deep soft tissues of the extremities (70%) and retroperitoneum (16%) and, occasionally, in the inguinal region; it rarely involves the spermatic cord and has been reported to represent only 10% to 11% of adult spermatic cord sarcomas[28, 29]. Almost 80% of spermatic cord malignant fibrous histiocytoma are found in adult patients of more than 50 years old, with ages range from 32 to 84 years[28, 30]. It usually develops as a slow-growing paratesticular mass[28, 29]. In our study, we reported a case of malignant fibrous histiocytoma in a 57-year-old man presented with a slow-growing, solitary scrotal mass.

Adenomatoid tumour is regarded as a distinctive benign mesothelial neoplasm of the paratesticular region[3,31,32]. It is the most common paratesticular neoplasm and accounts for approximately 30% of all paratesticular masses[31]. Adenomatoid tumour can be seen in all ages but mostly in the third to fifth decades of life[3, 31]. It occurs in the epididymis, spermatic cord, testicular tunics, as well as rete testis, ejaculatory duct and prostate. Other unusual locations include adrenal glands, pleura and lymph nodes[31]. The most common site of adenomatoid tumour is the epididymis; within or around its lower or upper pole[3,31,32]. We documented a case of adenomatoid tumour accounting for 25% of all paratesticular tumours in our study, from a 23-year-old patient presented with a right spermatic cord mass.

Metastases to the testis are unusual and rare, with a reported incidence of 0.02% to 2.5%[33, 34]. Very rarely, bilateral metastases have been reported in about 15% of all cases of metastasis to the testis[34,35,36]. The most common primary site of testicular metastases is the prostate, followed by the lung, melanomas, skin, colon, kidney, urinary tract and oesophagus[33,34,35]. Metastatic tumours of the testis occur later in life, during the fifth and sixth decades, when compared to primary testicular tumors[34]. Although most testicular metastases are detected incidentally during orchidectomy for advanced carcinoma of the prostate and as autopsy cases, few cases present as palpable testicular mass[33,34,35]. The histological feature of the testicular metastasis is the same as the primary prostate

cancer. The usual pathological feature of secondary testicular cancers is the microscopic demonstration of neoplastic cells in the interstitium with relative sparing of the tubules[33, 34]. In our study, we reported three cases of metastatic adenocarcinoma to the testis from the prostate in three patients, all in their sixth decade of life. The first and second patients, aged 50 and 55 years respectively, presented with a testicular mass. The third patient, 59 years old, was a case of bilateral testicular metastases after a therapeutic orchidectomy for advanced carcinoma of the prostate. The proposed mechanisms for the spread of lesions to the testis include: (i) retrograde venous extension or embolism; (ii) arterial embolism; (iii) lymphatic extension; and (iv) endocanalicular spread (via lumen of the vas deferens)[33,34,36].

Figure 1: Proportions of benign and malignant neoplastic testicular and paratesticular lesions

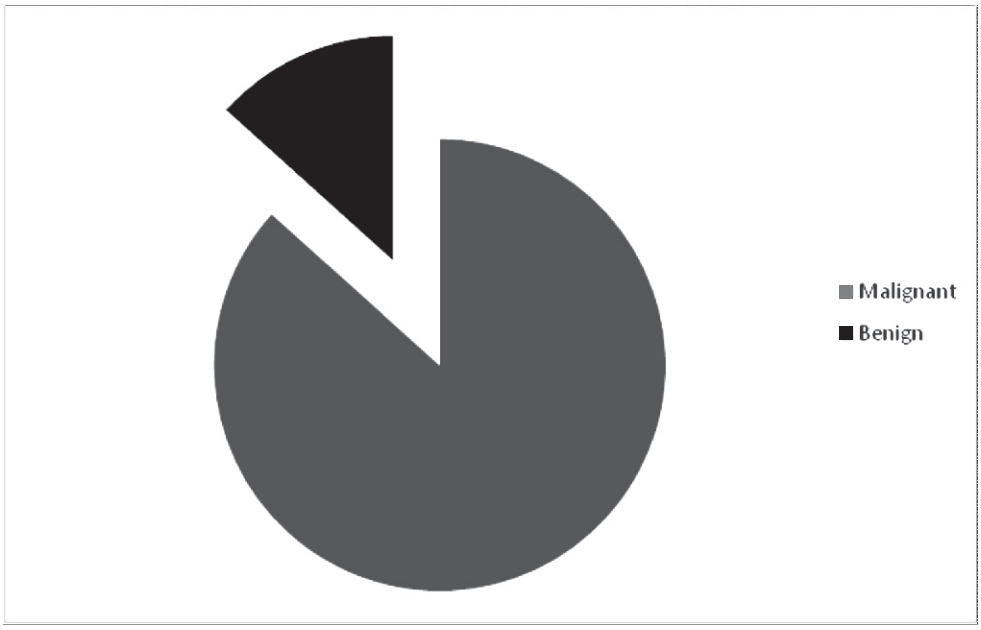

Table I:Age incidence of testicular and paratesticular neoplastic lesions

Age group (year)	NeoplasticLesions		Total	Percentage
	Benign	Malignant		
0-9				
10-19		2	2	14.3
20-29	1	4	5	35.7
30-39		1	1	7.1
40-49				
50-59	1	4	5	35.7
-		1	1	7.1
Total	**2 (14.3%)**	**12 (85.7%)**	**14 (100%)**	

Table II: Histopathological diagnosis of testicular and paratesticular neoplastic lesions

Age group (Year)	SEM	EST	TRT	RBD	MFH	ADM	MET	TOTAL
0-9								
10-19	1			1				2
20-29	1		2	1		1		5
30-39	1							1
40-49								
50-59			1		1		3	5
60 ≥		1						1
TOTAL	**3**	**1**	**3**	**2**	**1**	**1**	**3**	**14**

KEY TO TABLE II
SEM – Seminoma
EST – Endodermal Sinus Tumour
TRT – Teratoma
RBD- Rhabdomyosarcoma
MFH- Malignant Fibrous Histiocytoma
ADM- Adenomatoid tumour
MET – Metastastic carcinoma

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