A Twenty Year Retrospective Histopathological Analysis of Vascular Tumours in University of Benin Teaching Hospital

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Abstract

Introduction: Vascular tumours are a heterogeneous group of soft tissue lesions arising from blood vessels. These lesions range from benign borderline to malignant forms (WHO). These behavioral features are very essential especially as this may strongly influence the choice of treatment of cases. The aim of this study was to determine the histopathologic pattern of the vascular tumours in the body to demonstrate the prevalence of these groups of lesion.

Materials and method: The records of 123 histopathology consultations in the Department of Morbid Anatomy, University of Benin Teaching Hospital over a 20 year period which commenced January 1, 1990 - December 31, 2010 were retrieved and used. The lesions were individually reviewed and standardized in accordance with the standard classification system (World Health Organization classification of soft tissue tumours; 2013).

Results: The mean age involvement was 46±27 years and the prevalence, 3.44%. Haemangiomas were the most predominant of the tumours recorded in this study accounting for 59% (72) of the entire vascular tumours. The male female ratio was 1:1 and the lesions were distributed from the second to 6th decades of life. These tumours were predominantly 30(41%) localized to the head. Eight (8) cases of lymphangiomas were observed in this study and they constituted 7% of the entire vascular tumours and 10% of benign vascular tumours. Only two (2) cases of haemangioendotheliomas were recorded during the entire study period accounting for 2% of vascular tumours with both lesions located in the gluteal aspects of the lower extremities and axilla respectively and both responsible for 2% of vascular lesions. Kaposi sarcoma accounted for 31% (38) of the vascular tumours recorded in the index study with more of the tumours occurring in females (ratio 6:5).Only two cases of angiosarcomas were recorded constituting approximately 2% of the vascular tumours.

Conclusion: This analysis of vascular tumours showed that these lesions were relatively uncommon and demonstrated a wide anatomic and age distribution.

Key words: *age; gender; site; tumours; vascular*

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Introduction

Vascular tumours are a heterogeneous group of soft tissue lesions arising from blood vessels.[1] These lesions range from benign borderline to malignant forms (WHO).[2] These behavioural features are very essential especially as this may strongly influence the choice of treatment of cases.[3] Vascular tumours have been extensively studied by several groups especially with the observed relationship with human

immunodeficiency virus and Kaposi sarcoma.[4] Coffin and Dehner in their study categorized these tumours as constituting a quarter of soft tissue tumours (STT) in the USA.[5] Few studies on the distribution of vascular tumours have been conducted in Nigeria.[6-8] The aim of this study was to determine the histopathological patterns of the vascular tumours in University of Benin Teaching Hospital (UBTH) and to demonstrate the prevalence of these lesion. The spread of these tumours will be outlined which will influence desired budgetary and financial provisions for the management of patients with these lesions.[9]

Materials and Method

The records of 123 histopathology consultations in the Department of Morbid Anatomy, University of Benin Teaching Hospital were used during the 20 year period which commenced January 1, 1990 and ended December 31, 2010. Approval for this study was obtained from University of Benin Teaching Hospital ethics committee (protocol number ADM/E 22/A/VOL. VII/742) in accordance with the declaration of Helsinki in 1995 (revised in Edinburgh 2000).[9] Relevant clinical information were obtained from available surgical pathology records.

Inclusion criteria

Only mesenchymal lesions originating from somatopleuric mesoderm, intra-abdominal and retroperitoneal lesions arising in the chest, abdominal walls and paraspinal region were included in this study.[9]

Exclusion criteria

Cases where adequate clinical data could not be obtained or where original tissue blocks could not be found were excluded from this study. **Mesenchymal soft tissue arising from splanchnopleuric mesoderm including visceral adnexa and bone (except gastrointestinal stromal tumours) were not described in this study.**

Methodology

Tissues for analysis were processed using standard techniques which involved formalin fixed, paraffin embedded tissue specimen sectioned at 3μm. The obtained sections were then stained with haematoxylin-eosin and investigated with microscopes.[10,11] The lesions were individually reviewed and standardized in accordance with the most recent classification system by the World Health Organization.[2] The lesions were placed in one of the 10 anatomical categories listed thereof: hand wrist, upper extremity, proximal limb, girdle (axilla and shoulder), foot and ankle, lower extremity, hip and buttocks region, head and neck, trunk, retroperitoneum, and other lesions.[12]

Result analysis

A detailed description of the observed types was noted and the respective descriptive statistics especially mean, standard deviation, range, percentage frequency of age, gender and site distribution obtained with Statistical Package for the Social Science (SPSS) with which the data was analysed and then presented in tables.

Results

The mean age for all the vascular tumours was 46 ±27 years, with median/age range of 46/5.5-8.5 years and prevalence of 3.44 per 100,000. The haemangiomas were the most predominant of the tumours and accounted for 59% (72) of the entire vascular tumours. The most frequent type of haemangioma was the capillary type which accounted for 59% of the cases while cavernous

and pyogenic granuloma forms constituted the remaining 43% (22%, 21% respectively). The male female ratio was 1:1 and the lesions were distributed from the second to 6th decades of life. Specifically, most haemangiomas occurred in the first few decades of life (table 3) and they were predominantly localized 30(41%) to the head with capillary haemangioma constituting most of the vascular tumours in the face. Pyogenic haemangiomas were also observed to occur in the fingers while cavernous haemangiomas were permanently localized to the forearm.

Eight cases of lymphangiomas were observed in this study and they constituted 7% of the entire vascular tumours and 10% of benign vascular tumours. The lesions were observed in individuals in the first three decades of life especially in males. Majority 3(38%) of the lesions were observed to occur in the head and a few others in the extremities (table 3).

Two (2) cases of haemangioendotheliomas were recorded in the index study and this accounted for 2% of vascular tumours. The observed variety was the epitheliod type and only 1% each was observed to occur in a male (in the fourth decade of life) and female (in the 6th decade) respectively. The lesion was observed to occur in the gluteal aspect of the lower extremities and in the axilla.

Kaposi sarcoma accounted for 31% (38) of the vascular tumours recorded in the index study with more of the tumours occurring in females (ratio 6:5). The lesions were observed to occur in several age groups especially the third and fourth. The predominant site of involvement included the lower extremities specifically the foot.

Only two cases of angiosarcomas were recorded constituting approximately 2% of the vascular tumours. Both lesions were observed in males in their 4th and 6th decades of life and it involved the scalp and face.

Table 1: Soft Tissue Tumour and Gender Distribution

Diagnosis	Male	Female	Frequency	Percentage
Capillary Haemangioma	21	21	42	**34.15**
Pyogenic Granuloma	6	9	15	**12.20**
Carvernous Haemangioma	9	7	16	**13.00**
Haemangioendothelioma	1	1	2	**1.63**
Lymphangioma	5	3	8	**6.50**
Angiosarcoma	2		2	**1.63**
Kaposi Sarcoma	17	21	38	**30.89**
Total	**61**	**62**	**123**	**100**

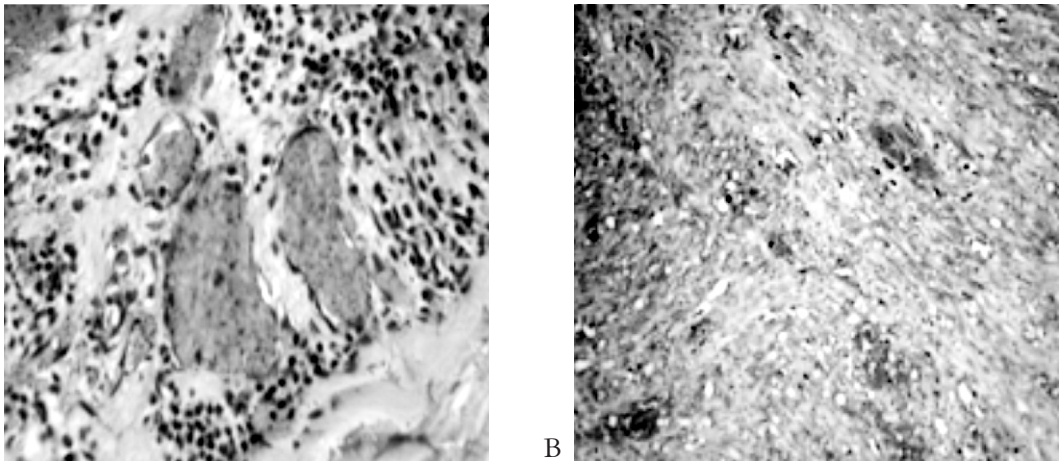
Table 2. Site Distribution of Vascular Tumours

SITE/TYPES		CH	AS	PG	CrH	H	L	KS	TOTAL (%)
Head	Scalp	5	1	1	2		1	1	**11**
	Face	15	1	4	3		2	1	**26**
	Neck	2	-	-	2		1	-	**5**
Trunk	Chest	-	-	-	1		-	-	**1**
	Abdomen	2	-	-	1		-	-	**3**
	Back	-	-	-	-		-	-	**-**
Upper extremity	Forearm	-	-	-	3	-	-	-	**3**
	Arm	2	-	-	1	-	-	-	**3**
	Finger	1	-	4	-	-	-	-	**5**
	Shoulder	-	-	-	-	-	-	-	**-**
	Hand	-	-	-	1	-	-	-	**1**
	Axilla	-	-	-	-	1	1	-	**2**
	Wrist	-	-	-	-	-	-	-	**-**
Lower extremity	Gluteal	1	-	1	-	1	-	1	**4**
	Leg	3	-	1	1	-	1	1	**7**
	Thigh	-	-	-	1	-	-	2	**3**
	Foot	-	-	-	-	-	-	7	**7**
Others		**11**		**4**			**2**	**25**	**42**
Sum TOTAL (%)		**42**	**2**	**15**	**16**	**2**	**8**	**38**	**123**

CH:carvenous haemangioma, AS:angiosarcoma, PG:pyogenic granuloma, CrH:carpillary haemangioma, H:haemangioendothelioma, L:lymphangioma, KS: Kaposi sarcoma

Table 3; Ten year interval gender distribution of vascular tumour types

DIAGNOSIS	0-10			11-20			21-30			31-40			41-50			51-60			61-70			71-80			81-90			M	F	Total
	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ	M	F	Σ			
Capillary Haemangioma	4	4	8	4	4	8	5	4	9	3	4	7	2	1	3	-	3	3	2	-	2	1	-	1	-	-	-	21	21	42
Angiosarcoma	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	1	2	-	-	-				2		2
Pyogenic granuloma	-	-	-	-	3	3	2	2	4	2		2	2	1	3		1	1		2	2							6	9	15
Cavernous haemangioma	3	3	6		2	2	4	1	5				2		2		1	1										9	7	16
Haemangioendothelioma							1			1		1				1	1	2										1	1	2
Lymphangioma	1	1	2	1	1	2	3		3		1	1		1	1													5	3	8
Kaposi sarcoma		2	2		1	1	2	8	10	8	9	17	4		4	1	1	2	1		1		1	1	1		1	17	21	38
Total	8	10	18	5	11	16	16	15	31	15	13	28	11	2	13	1	7	8	4	2	6	1		1	1		1	61	62	123



Slide 1(A);a section of Cavernous haemangioma showing several variously sized blood vessels with thin walls and lumina filled with blood. The vessels are disposed in a loose connective tissue background in which are lypmhoplasmacytic cell infiltrates. Slide 2(B); Kaposi sarcoma; Section shows several thin walled vascular spaces lined by atypical spindle cells. The nuclei of these cells are round to oval and there is marked extravasation of red blood cells into the intervening loose connective tissue stroma.

Discussion

Benign vascular tumours;

The index study revealed that benign vascular tumours were the most abundant of the vascular tumours constituting over half of the entire vascular soft tissue tumours recorded. This finding was not new as several authors have demonstrated that benign vascular tumours were more common than borderline/ intermediate and malignant vascular tumours.[6,7,8] The observations in some previous Nigerian studies were however much higher than was outlined in this study.[6,7] A twelve year retrospective study in Benin however included perivascular tumours which have currently been categorized into a separate entity of soft tissue tumours in the most recent WHO classification of soft tissue tumours.[6] Similarly, the study in Lagos only involved the paediatric age group in whom intermediate tumours such as Kaposi sarcoma (KS) are rather rare.[7]

Haemangioma's were the most abundant benign vascular tumours closely followed by pyogenic granuloma's while lymphangiomas constituted the least of the benign types. This observation was not different from recent finding in a Cameroon study though reasons for these presentations are still unknown.[12] Importantly also, most of the tumours were observed in the first three decades of life as had been previously described.[13-15] The reason for this age distribution could be attributed to the age of presentation of patients affected with these lesions. Individuals affected by the benign vascular tumours had a tendency of presenting early for possible treatment especially as majority of the lesions occurred in the face. It is likely that parents, guardians or adults would attempt treatment early especially for cosmesis.

The gender distribution of the benign tumours revealed a slight male predominance over their female counterparts. The previous study by Banjo and Malami in Lagos described a gender

ratio of 3:1 (male female ratio) unlike the slight male predominance reported elsewhere.[7,16] Unlike in the Lagos study where males displayed a higher percentage for both pyogenic granuloma and cavernous haemangiomas, no gender differences for cavernous haemangioma's was observed in the index study though a higher female disposition for pyogenic granuloma was recorded as was emphasized previously in Benin.[7,8]

Intermediate vascular tumours;

These tumours constituted over a third of the vascular tumours recorded in the index study with KS constituting the only type in the group. Several studies have associated KS caused by HHV8 with several haematologic malignancies and more specifically, AIDS (AIDS associated/related KS).[12-13] It was not therefore surprising that this lesion was demonstrated in the 3rd ,4th and 5th decades of life as had been earlier reported.[17] The few cases recorded at the extremes of life were not entirely new either as several studies have recorded that KS had presented in infancy.[18] The reason for the dominant age distribution may not be unrelated to the heightened sexual activity common within early and mid adulthood.[19] Early education, attitudinal and cultural adjustment may improve exposure to this lesion for which treatment modalities are currently unavailable.

Though several reports have demonstrated strong gender dimorphism of Kaposi sarcoma (KS) in favour of males, this study demonstrated a higher frequency in females. This presentation was not however surprising as demonstrated in recent investigations on vascular tumours,[6,20] further affirming the gender reversal in presentation of KS as discussed previously.[8] In a study, the female susceptibility to KS was attributed to the higher transmission rates from males infected with HIV to their female counterparts than would occur in the reverse (female to male).[21,22]

Malignant vascular tumours;

Epitheliod haemangioendothelioma's have been described as low grade malignant endothelial vascular neoplasms which could occur in all ages but was rare in children.[22] The observations in the current study showed that the lesion occurred equally in the 4th and 6th decades in both sexes. Superficial, deep tissue and multi-organ involvement have been reported to occur. Though the cases described in this study were located mainly in the skin of the extremities.[13,22]

Angiosarcoma's were the only frankly malignant tumours recorded in this study. They constituted only a small percentage of the entire vascular tumours and this was not surprising as they have been recorded to be very rare tumours.[19,23-25] All the lesions documented in the index study presented only in males. This finding was not new as most recent reports in some parts of Africa recorded similar observations. Though cases of Juvenile angiosarcoma's had been recorded previously, most lesions have been demonstrated to present in the elderly as was displayed in the index study.[12] Similarly, most cases of this lesion had been previously documented to occur in deep (intramuscular) sites, especially in the lower extremities were majority occurred on the skin of the head (specifically, the face/scalp) as was documented in the index study.

Conclusion

This analysis of vascular tumours showed that these lesions were relatively uncommon and demonstrated a wide area of anatomic and age distribution. With regards to gender, females displayed only a slight predominance over their male counterparts while benign tumours contributed the highest type followed by intermediate and finally, the malignant, the least.

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