

## Histopathology Of Tumor And Tumor Like Conditions Of Blood Vessels And Lymphatics

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**Abstract:** Introduction: Vascular Neoplasms are divided into benign, intermediate and malignant subtypes according to WHO classification. The majority of vascular tumors are of benign nature. The aim of this study is to observe the histopathological pattern of tumors and tumor like conditions of blood vessels and lymphatics. Material and methods: An observational study was done over a period of one and half years (Jan 2017 to June 2018) at the Histopathology Department of AMC MET Medical College, L.G. Hospital, Maninagar, Ahmedabad which is a tertiary care hospital of East Ahmedabad. There were 75 histopathological cases of vascular tumors & tumor like conditions. Results: Out of 75 cases, 63 were benign, 2 were malignant and 10 were arteriovenous (AV) malformation. The majority of tumors were located in Head & Neck region (n=48), followed by 13 in Trunk region & 14 in extremities. There were 28 cases of pyogenic granuloma, 18 cases of capillary hemangioma, 9 cases of cavernous hemangioma, 1 case of lymphangioma, 2 cases of epithelioid hemangioma, 5 cases of cystic hygroma, 2 cases of angiosarcoma and 10 cases of AV malformation. Majority of the patients were males. Conclusion: Benign lesions were the most common variety amongst tumors and tumor like conditions of blood vessels and lymphatics. Among the benign vascular tumors, Granuloma Pyogenicum was the commonest followed by capillary hemangioma. Histological diagnosis of AV malformation helps in proper management of the condition. [Chakrabarti B Natl J Integr Res Med, 2019; 10(4):1-5]

**Key Words:** Vascular tumors, AV malformation, Lymphatic vessels, Hemangioma, Angiosarcoma

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**Introduction:** Vascular lesions are encountered very commonly in clinical practice, with vascular tumors constituting the most common tumors in children. Vascular lesions have been described as the “Oldest tumors” because of the discovery of intra-osseous hemangiomas in dinosaur vertebrae<sup>1</sup>.

Tumors of blood vessels and lymphatics constitute a spectrum ranging from benign hemangiomas to intermediate lesions that are locally aggressive but infrequently metastasize to rare highly malignant angiosarcomas. Congenital or developmental malformations and non-neoplastic reactive vascular proliferations can also present as tumor like lesions. Because the growth pattern of vascular neoplasms appears to depend on the same signaling pathways that regulate angiogenesis, treatment with inhibitors of angiogenesis is a rational therapy that is being explored<sup>2</sup>.

### Aims And Objectives:

1. To study histopathological patterns of tumor and tumor like conditions of blood vessels and lymphatics.
2. To study incidence of tumor and tumor like conditions of blood vessels and lymphatics in relation to age, gender and location.

3. To differentiate hemangioma and arteriovenous malformation based on histopathological patterns.

**Material And Method:** The study was done retrospectively over a period of one and half years (Jan 2017 to June 2018) at the Histopathology Department of AMC MET Medical College, L.G. Hospital, Maninagar, Ahmedabad which is a tertiary care hospital of East Ahmedabad. There were 75 histopathological cases of vascular tumors and tumor like conditions. The details of all clinically suspected vascular lesions received for histopathological examinations were collected. A detailed gross examination of specimen was carried out. For histopathological examination, formalin fixed and paraffin embedded representative tissue sections were stained with hematoxylin and eosin. Von Gieson stain was used to demonstrate elastic fibers of arteries. The vascular lesions were classified as per WHO classification<sup>3</sup>. The details of clinical history, relevant investigations and radiological findings were obtained and correlated.

**Result:** There were 75 cases of vascular tumors and tumor like conditions in which following observations were made.

**Table 1: Relations between Age and Histological diagnosis of lesions**

Age(years)	CAP	GP	CAV	LY	EH	CH	AS	AVM
0-10	1	2	2	-	-	2	-	3
11-20	6	6	1	1	1	-	-	1
21-30	5	8	2	-	-	1	1	3
31-40	2	4	2	-	-	1	-	1
41-50	2	3	1	-	1	1	1	2
>51	2	5	1	-	-	-	-	-
Total	18	28	9	1	2	5	2	10

[ACRONYMS: CAP = Capillary Hemangioma, GP=Granuloma Pyogenicum, CAV=Cavernous Hemangioma, LY=Lymphangioma, EH=Epithelioid Hemangioma, CH = Cystic Hygroma, AS=Angiosarcoma, AV=Arteriovenous, AVM=Arteriovenous malformation]

**Table 2: Distribution of vascular lesion in relation to site**

Head & Neck	Trunk	Extremities	Total
48	13	14	75

In the present study, majority of lesions of blood vessels and lymphatics were benign in origin accounts for 63 and malignant lesions are very less accounts for 2. (Table 3).

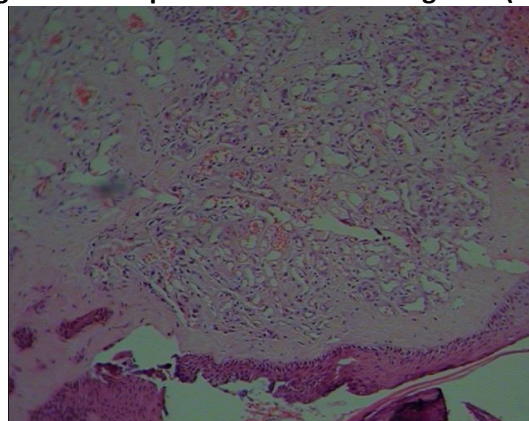
**Table 3: Distribution of Vascular Lesions as per Diagnosis (75 cases)**

Lesion	No of cases
Benign	63
Malignant	02
AV Malformation	10
Total	75

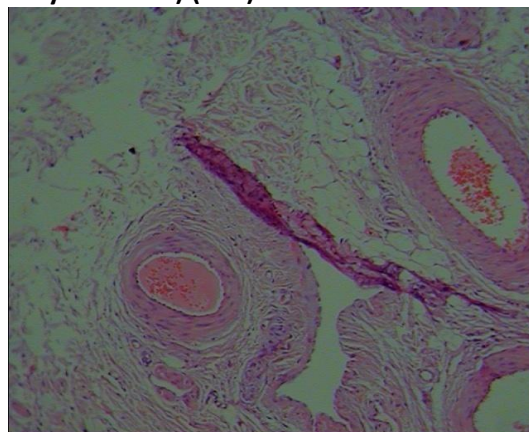
The commonest site for all vascular lesions was Head and Neck region (Table 2). Granuloma pyogenicum was the most common benign vascular tumor followed by capillary hemangioma, AV malformation and cavernous hemangioma (Table 1, Image 1-3). Out of 75 lesions, maximum lesions were observed in age group of 21-30 years. Capillary hemangioma and AV malformation were commonest tumors

before 30 years of age. Granuloma pyogenicum was seen in all age groups but was more common in age of 11-40 years (Table 1). Vascular lesions are seen more commonly in males than in females, including all the age groups. (Table 4)

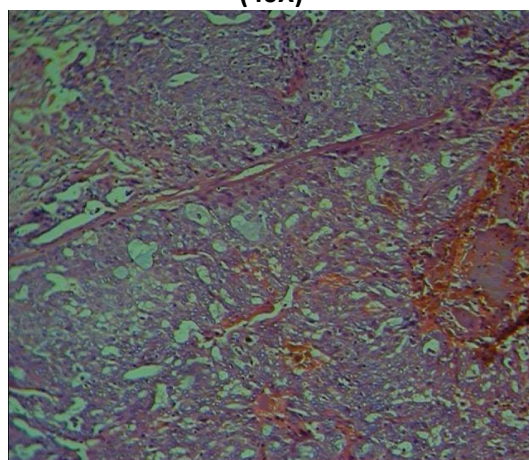
**Fig 1: Microscopic Features of Hemangioma (10X)**



**Fig 2: Microscopic Features of AV Malformation (Artery and Vein) (40X)**



**Fig 3: Microscopic Features of Angiosarcoma (40X)**



**Table 4: Age and gender wise distribution**

Age (Years)	Male	Female	Total
0-10	06	02	08

1-20	09	07	16
21-30	14	07	21
31-40	03	05	08
41-50	05	03	08
>51	09	03	12
Total	48	27	75

**Table5: Comparing distribution of pyogenic granuloma in present study with other similar studies**

Site	Name of study		
Head and Neck	Enzinger et al <sup>4</sup>	Kapuria et al <sup>5</sup>	Present study
	152 out of 289	15 out of 26	19 out of 28

**Table 6: Comparing distribution of lesions in present study with other similar studies**

Lesion	Kapuria et al <sup>5</sup>	D. Kalyani et al <sup>6</sup>	Present study
Capillary hemangioma	37/100 (37%)	7/98 (7.1%)	18/75 (24%)
Granuloma pyogenicum	26/100 (26%)	47/98 (47%)	28/75 (37.3%)
Cavernous hemangioma	15/100 (15%)	8/98 (8%)	9/75 (12%)
Lymphangioma	7/100 (7%)	-	1/75 (1.3%)
Epithelioid hemangioma	3/100 (3%)	-	2/75 (2.6%)
Cystic hygroma	1/100 (1%)	-	5/75 (6.6%)
Angiosarcoma	1/100 (1%)	4/98 (4%)	2/75 (2.6%)
Arteriovenous malformation	-	6/98 (6%)	10/75 (13.3%)

**Discussion:** Pyogenic granuloma, which is more appropriately called lobular capillary hemangioma, contains a superficial region of ulceration in which neutrophils around in the more superficial lobules<sup>7</sup>. Pyogenic granuloma affects children or young adults of either gender but the age range is wide; hands, fingers and face especially lips and gums are the most common sites. Pyogenic granuloma of the gingiva in pregnancy (epulis of pregnancy), granuloma gravidarum, is a special subgroup<sup>3</sup>. Pyogenic granuloma, was the most common vascular tumor in present study. Out of 28 cases, 19 were

located in Head & Neck region including gingival, buccal mucosa, chest, face & scalp with remaining 4 located in trunk & 5 in extremities. One case of pregnancy tumor was also found in present study. The findings in our study are comparable to those of Kapuria et al<sup>5</sup> and D. Kalyani et al<sup>6</sup>.

Hemangiomas occupy a gray zone between hamartomatous malformation and true neoplasms<sup>8</sup>. They are frequently designated and regarded as tumors because of their localized nature and mass effect<sup>8</sup>. A high percentage occur in children and many are present at birth. While over half of the cases are in head and neck area, they can also occur in trunk or extremities<sup>2,8</sup>. They are very common tumors characterized by increase in number of normal or abnormal vessels filled with blood. These lesions constitute 7% of all benign tumors of infancy and childhood<sup>2</sup>. Capillary hemangiomas are composed of thin walled capillaries with scant stroma. Cavernous hemangiomas are composed of large and dilated vascular channels. Cavernous hemangiomas are more infiltrative and frequently involve deep structures. Capillary hemangiomas formed the second largest group in present study. Our findings (24%) were comparable to the findings of Kapuria et al<sup>5</sup> (37%). Out of 18 cases, 12 were in head and neck region, 1 in trunk and 5 in extremities. There was almost equal incidence in males and females. The proportion of cavernous hemangiomas in our study (12%) was similar to that seen in studies by Kapuria et al<sup>5</sup> (15%) and D. Kalyani et al<sup>6</sup> (8%).

Epithelioid hemangioma is the accepted term for the lesion angiolymphoid hyperplasia, often found as subcutaneous lump in head and neck, especially around ear of middle aged males<sup>4</sup>. In present study we had 2 cases of epithelioid hemangioma, both located near the auricular region. We had one case in a twenty-year patient and another in a middle age patient. The findings of present study were similar to the study by Kapuria et al<sup>5</sup>.

Lymphangiomas are tumors of lymphatic vessels and are less common than hemangioma and comprise 4% of all vascular tumors<sup>9</sup>. The great majority of tumors are benign and represent as developmental malformations. Simple lymphangiomas are slightly elevated or pedunculated lesions up to 1-2 cm in diameter that occur predominantly in the head, neck and

around axillary subcutaneous tissue<sup>2</sup>. Cystic Hygroma is a variant of cavernous lymphangioma in which there is macroscopic dilatation of vascular (lymphatic) channels. Cystic Hygromas occur in neck, axilla and groin. Cavernous Lymphangiomas occur in oral cavity, limbs and abdomen<sup>9</sup>. Microscopically the dermis and subcutis contain dilated thin walled lymphatic channels lined by endothelial cells and contain proteinaceous lymph<sup>9</sup>. We had one case of lymphangioma and five cases of cystic hygroma, unlike the findings of Kapuria et al<sup>5</sup> who reported seven cases of lymphangioma and one case of Cystic hygroma. Angiosarcoma is one of the rarest soft tissue neoplasm<sup>4</sup>. They comprise less than 1% of all sarcomas. Angiosarcoma is a malignant endothelial neoplasm that primarily affects older adults. There is equal gender predilection and often involves skin, soft tissue, breast and liver. Histologically the tumor is composed of numerous irregular anastomosing vascular spaces with distinctive pattern between collagen bundles. The vascular channels are lined by pleomorphic hyperchromatic endothelial cells which frequently show multilayering and papillary growth along with normal and abnormal mitosis<sup>10</sup>. There are two cases of angiosarcoma in present study, both diagnosed in elderly males and present in skin of scrotum and deep soft tissue of chest wall. The findings were similar to those of Kapuria et al<sup>5</sup>.

Arteriovenous Hemangioma (AV malformation) is an uncommon lesion. These are tangles of deformed arterial afferents and draining veins devoid of and interposed capillary bed<sup>8</sup>. It is divided into two distinctive variants according to depth of involvement. The deep type usually presents in the head and neck or limbs of adolescents and young adults and can be associated with severe degrees of arteriovenous shunting and soft tissue hypertrophy. These deep lesions probably represent congenital malformations. The superficial type which is also known as cirroid aneurysm or acral arteriovenous tumor typically presents in skin of the head and neck (especially of lip) of middle aged or elderly adults (often males) as a small red blue papule. Histologically both variants show a mixture of thick and thin walled blood vessels that correspond to arteries & veins of varying caliber with a predominance of later serial sections are helpful in demonstrating arteriovenous anastomosis<sup>9</sup>. In this study the presence of intralesional nerve was a helpful discriminator that

can be of diagnostic utility for histopathologists for the correct classification and diagnosis of hemangiomas and AVMs. Hemangiomas and AVMs were distinguished from each other histologically on the basis of absence or presence of arteriovenous structures<sup>10</sup>. Considering the differences in the pathobiology and natural history of these lesions, as well as the therapeutic and prognostic implications of accurately distinguishing between hemangiomas and AVMs, it is important that these lesions be correctly diagnosed<sup>1</sup>. We had 10 cases of AV malformation (13%), which differed from that of D. Kalyani et al<sup>6</sup> who reported 6 cases of AV malformation out of 98 cases (6%). In present study head and neck region was found to be the commonest site.

**Conclusion:** In our study, majority of vascular tumors were of benign nature. The vascular tumors were more common in children and young adults. Pyogenic granuloma was the commonest benign vascular tumor followed by capillary and cavernous hemangioma. Majority of the patients were males in the present study. Head and Neck region was the commonest site of vascular tumors. AVMs were diagnosed by presence of arteries, veins and nerve fibers.

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