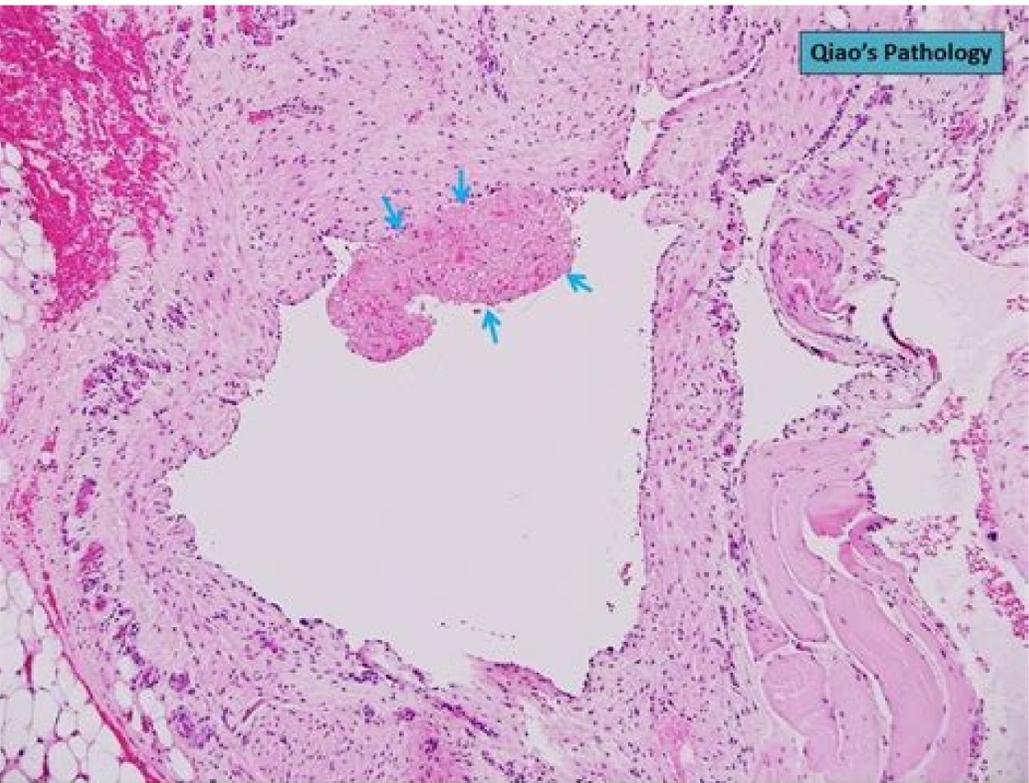


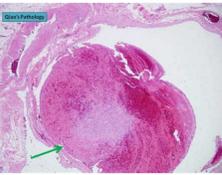
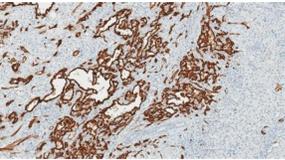
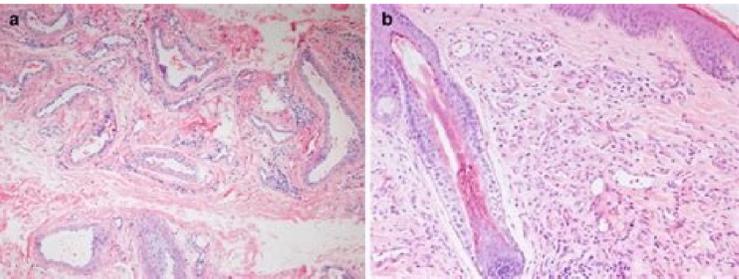
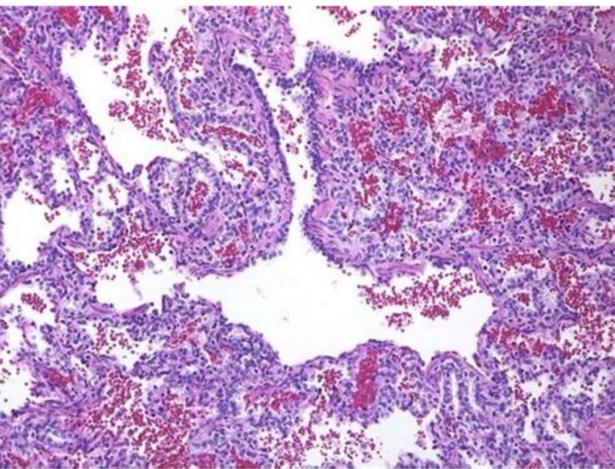
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Qiao's Pathology



Focal early mural thrombus formation (blue arrows) in a dilated vascular channel



Furthermore, they may be confused with each other at histopathology. Paraffin tissue blocks were retrieved in all the remaining 94 cases and these were included in the study. Three sections of 4 μ thickness were cut from each block containing the representative lesion. This is in part due to lack of agreement regarding the nosology and classification of these lesions both for diagnostic and therapeutic purposes. Thus, this study analyzes findings seen in 44 cases of AVM and 50 cases of hemangiomas, that is, in 94 cases of benign vascular lesions. Figure 1: Photomicrograph of arteriovenous malformation showing prominent elastic fibers in walls of the arteries (Verhoeff's stain, x200). Click here to view Maximum cases (20; 45.45%) of AVMs were between 10 and 30 years of age, while most hemangiomas (27; 54%) were in the age group of 20-40 years. [3] In 1982, Mulliken and Glowacki [4] introduced a new classification based on the clinical and histological characteristics of vascular lesions. Mast cells may enhance directional elongation of new capillary sprouts by sustained release of heparin. J Cutan Pathol 1974;1:73-87. [PUBMED] 7. Folkman J, Klagsbrun M. Hemangioma versus vascular malformation: Presence of nerve bundle is a diagnostic clue for vascular malformation. The diagnoses of all the 34 cases of AVM were confirmed on review. Ectatic blood vessels in port-wine stains lack innervation. Possible role in pathogenesis. You can subscribe online for a year. Hematoxylin and eosin (H and E) stain and Verhoeff's stain for elastic tissue were done on all cases and lesions were classified into hemangiomas or arterio-venous malformations (AVM). Carapeto et al. Use of elastic stain helps in accurately discriminating between AVMs and hemangiomas by clearly outlining arteries and arterioles. Adegboyega and Qui [3] used S100 stain to assess the presence of nerves and nerve fibers in hemangiomas and vascular malformations. A total of 94 cases, where complete clinical details and representative paraffin sections were available, were included in this study. 53.1% (50) cases were found in the head and neck region, 30.8% (29) were found on the extremities. Mean mast cell density was significantly high in proliferating hemangiomas compared to involuting ones showing the presence of fibrosis. Most studies mention that hemangiomas usually appear in the 1st year of life. [14] found a mean of 35.9 mast cells/high power field (HPF) in four hemangiomas, while the mean cell count in seven patients with vascular malformations was 0.7/HPF. Lascano [16] and Baroni [17] identified increased numbers of mast cells in several vascular tumors. We compared the mast cell density in 16 cases of proliferating hemangiomas and 27 cases of involuting hemangiomas. With these specifications the magnification is × 1000 and field view diameter is 0.18 mm. [12] Intra-lesional nerves were seen in significantly higher number of AVMs as compared to hemangiomas. [6] Further, lesions were evaluated for (a) presence or absence of intra-lesional nerves and (b) mast cell counts. Mast cell counting was done in toluidine blue stained sections using Nikon YS100 model biological microscope in all the cases using 100 oil immersion objective and × 10 eye piece. Cancer 1958;11:1110-4. [PUBMED] 17. Baroni C. This may be accounted for by the confusion in the classification and nomenclature of cutaneous vascular lesions. Mast cells in hemangiomas and vascular malformations. [15] mentioned the presence of mast cells around vessels. Lesions which showed presence of arteries and arterioles on elastic stain reclassified as AVM [Figure 1]. This classification was later accepted at the 1996 biennial meeting of the International Society for the Study of Vascular Anomalies. Koutlas and Jessurun [11] found 6-22 mast cells/HPF in the stroma and around vascular components in 6 cases of AVMs. Girard et al. Mean mast cell density was significantly higher in proliferating hemangiomas (53.12 ± 27.83 cells/mm²) compared to involuting hemangiomas (11.43 ± 7.9 cells/mm²). This study includes 120 consecutive cases of benign vascular lesions reported during a 12-year period (1997-2008). Only three cases of hemangiomas showed the presence of intra-lesional nerves, and even they were in the form of isolated nerve fibers. Mast cell density ranged from 0 to 95 cells/mm² in cases of AVM, while it ranged from 2 to 136 cells/mm² in cases of hemangiomas. Acral arteriovenous tumor. Eur Arch Otorhinolaryngol 2001;258:141-9. 13. Rydh M, Malm M, Jernbeck J, Dalsgaard CJ. If you are already a subscriber you can login to access the articles. The mean mast cell density in proliferating hemangiomas was 53.12 ± 27.83 cells/mm², while it was 11.43 ± 7.9 cells/mm² in involuting hemangiomas. [2] Arteriovenous vascular malformations and hemangiomas are benign vascular lesions that are difficult to distinguish from one another clinically. The mean mast cell density in AVM was 25.31 ± 27.3 cells/mm², while it was 29.36 ± 25.06 cells/mm² in hemangiomas. This difference was not statistically significant. Table 2: Distribution of cases according to pattern of intra-lesional nerves. Click here to view We compared mast cell density in involuting (n = 23) and proliferating (n = 16) hemangiomas. Hemangiomas thus may arise or be maintained by abnormal concentrations of mast cells within developing connective tissue; the endothelial cells and vascular channels may involute when stimuli from mast cells are no longer present. Any classification is justifiable only if it has diagnostic applicability in planning therapy. Intra-lesional nerves were identified in 91% (69/76) of their cases of AVMs. In contrast, no intra-lesional nerve was detected in any of the 91 hemangiomas. This is because most hemangiomas are followed up clinically with little or no intervention and seldom operated upon. Science 1987;235:442-7. [PUBMED] 8. Klagsbrun M, D'Amore PA. Hemangiomas versus arterio-venous malformations: Role of elastic stains and mast cell density. [3] Our results showed that nerve bundles are consistently present in AVMs and absent in hemangiomas and so they can be used as a diagnostic clue to differentiate between these lesions even in H and E stained sections. We found that the mast cell density ranged from 0 to 95 cells/mm² in cases of AVM while it ranged from 2 to 136 cells/mm² in cases of hemangiomas. Vascular birthmarks of infancy: Resolving nosologic confusion. [1] The diagnosis and management of these lesions present diagnostic and therapeutic challenges to surgeons, radiologists, and histopathologists. [6] also reported increased numbers of mast cells in the stroma, but they did not further elaborate on this observation. Adv Dermatol 1997;13:375-423. 6. Girard C, Graham JH, Johnson WC. Therefore, 40 nonoverlapping fields were counted to obtain mast cell count per mm² area. Vascular tumors and vascular malformations (new issues). Arch Pathol Lab Med 2005;129:772-5. 4. Mulliken JB, Glowacki J. Acta Derm Venereol 1977;57:155-8. [PUBMED] 16. Lascano EF. Thus, for counting in 1 mm² area, we have to do the cell count in 1/0.0254 = 39.37 fields, or rounded up to 40 fields. Annu Rev Physiol 1991;53:217-39. 9. Natali J, Merland JJ, Mulliken and Glowacki [4] believed that sophisticated laboratory techniques are not necessary to assign a lesion to either of the two major categories: Hemangioma or malformation. The presence of arteries and arterioles are an integral part of AVMs. The presence of the intra-lesional nerves can be useful to distinguish between AVMs and hemangiomas even on H and E stained sections. Burrows et al. [7],[8] Therefore, arteries and arterioles are not part of the lesions. In each representative section, 40 fields were counted to obtain the number of cells per mm². All data were entered in MS Excel and statistical analysis was performed. Hemangiomas, being the result of abnormal proliferation, often respond to treatment and corticosteroids. Current concepts in the classification, diagnosis and treatment of hemangiomas and vascular malformations of the head and neck. Arteriovenous hemangioma (arteriovenous shunt). Childhood hemangiomas and vascular malformations: Angiographic differentiation. Materials and Methods: A total of 120 cases of benign vascular lesions were retrieved from 12 years period. [6] AVMs are the result of errors of morphogenesis and contain complex intercommunicating arterial and venous structures. [10] Therefore considering the therapeutic importance of accurately distinguishing between hemangiomas and AVMs, it is important that these lesions be correctly diagnosed. Koutlas and Jessurun [11] used orcein stain to study the presence and distribution of elastic fibers in the vascular components from 6 cases of arteriovenous hemangiomas. J Cutan Pathol 1994;21:343-9. 12. Werner JA, Dinne AA, Folz BJ, Rochels R, Bien S, Ramaswamy A, et al. Lymphat Res Biol 2003;1:259-65. [PUBMED] 2. Hand JL, Frieden IJ. AVMs, by definition are technically present at birth, but may not become noticeable until much later in life, with some coming to attention as late as the time immediately after puberty. However, 10 cases of hemangiomas were reclassified as AVM on the basis of the histologic criteria. You could recommend your institution's library to subscribe the journal so that you can have unrestricted access. [12] AVMs do not involute; and may sometimes increase in size because of vascular ectasia induced by conditions such as sepsis, trauma, puberty, and pregnancy. The significantly higher mast cell density seen in proliferating hemangiomas compared with involuting ones, seem to suggest that mast cells play an important role in the natural history of these lesions. Keywords: arterio-venous malformation, elastic stain, hemangioma, mast cells How to cite this article: Pawane P, Anshu, Gangane N. We also studied mast cell density in hemangiomas and AVMs to determine if they differed significantly. This study was carried out in the Department of Pathology, Mahatma Gandhi Institute of Medical Sciences, Sevagram, India from June 2006 to August 2008. Only three cases of hemangiomas showed the presence of intra-lesional nerves and even they were in the form of isolated nerve fibers. Conclusions: Use of elastic tissue stains are useful ancillary tools to distinguish between AVMs and hemangiomas. Those lesions which exhibited a history of rapid neonatal growth and slow involution, characterized by hypercellularity during the proliferating phase and fibrosis and diminished cellularity during the involuting phase were hemangiomas and those present at birth which grew commensurately with the child were characterized by a normal rate of endothelial cell turnover were malformations. It is unlikely that mast cells alone are the direct cause of hemangiomas, yet their abundance in proliferative lesions only suggests that they may have a role in the natural history of these lesions. On the other hand, result from derangement in angiogenesis from exuberant proliferation of vascular elements. Only those cases, which showed clear cut evidence of proliferation or involution, were included in this analysis [Table 3]. Indian J Pathol Microbiol 2014;57:191-5 How to cite this URL: Pawane P, Anshu, Gangane N. Pediatrics 1982;70:48-51. [PUBMED] 19. Azizkhan RG, Azizkhan JC, Zetter BR, Folkman J. AVMs were twice as common in men than women (male:female = 2.4:1). 1. Chang MW. They used only two categories to classify vascular lesions: Hemangiomas and vascular malformations. Br J Cancer 1964;18:686-91. [PUBMED] 18. Glowacki J, Mulliken JB. Therefore, area of the field view using the formula for the area of a circle = πr² (where r is the radius of a circle) is 0.0254 sq mm. Context: Vascular anomalies present diagnostic challenges to histopathologists. To access the article in PDF format, you should be a subscriber to Indian Journal of Pathology and Microbiology. Click here to recommend the journal. Indian J Pathol Microbiol [serial online] 2014 [cited 2022 Feb 3];57:191-5. [3] It is clinically relevant to differentiate between arteriovenous vascular malformations and hemangiomas. (Angiodyplasias). Superselective arteriography and therapeutic embolisation for vascular malformations. However 10 cases originally diagnosed as hemangioma turned out to be AVM on using these criteria. Adegboyega and Qui [3] used Movat pentachrome stain to assess various tissue components in hemangiomas and AVMs. Because arteries and arterioles are an integral part of AVMs, the pathologists can rely on elastic stains as ancillary tools for making a definitive diagnosis of AVMs. In our study, 45.45% of cases of AVM were between 10 and 30 years of age, while 54% of all hemangiomas were in the age group of 20-40 years. Heparin alone does not stimulate endothelial cell proliferation but is an important amplifier in angiogenesis. Medium sized nerves or thick nerve bundles were seen in 56% of the AVMs while they were not seen in any of the hemangiomas. Management of patients with hemangiomas and arteriovenous malformations. Presence of the intra-lesional nerves can be a useful histologic feature to distinguish between AVMs and hemangiomas even on H and E stained sections. Considering the absence of nerve fibers in those lesions, Adegboyega and Qui [3] suggested they are better classified as venous hemangiomas. Medium and thick sized nerve bundles were seen in 56% of AVMs, while they were not seen in any of the hemangiomas. [9] Not only will AVMs that are misdiagnosed as hemangiomas and treated as such, fail to respond to medical treatment with pharmacologic agents; error in the surgical management of such lesions may also result in treatment failure and loss of angioaccess for proper management of the lesion in the future. Aim: This study explored diagnostic clues in the histomorphology of hemangiomas and vascular malformations. Mulliken and Glowacki's classification categorizes vascular lesions into hemangiomas and vascular malformations. Heparin has been shown to be a potent stimulus of endothelial migration. The mean mast cell density in AVM was 25.31 ± 27.3 cells/mm² while it was 29.36 ± 25.06 cells/mm² in hemangiomas and this difference was not statistically significant. [13] he reported absence of nerve bundles and paucity of nerve fibers around the dilated vessels in nine cases of port-

wine stains and concluded that loss of vascular tone due to the absence of adequate nerve supply may be responsible for the vascular ectasia that characterizes those lesions. Only a handful of previous studies have focused on the presence of distribution of nerves in benign vascular lesions. Intra-lesional nerves were found in 81.8% (36 cases) of AVM [Figure 2], while they were seen in only 6% (3 cases) of hemangiomas. Mast cell heparin stimulates migration of capillary endothelial cells in vitro. Mast cell density in all lesions was calculated from toluidine blue stained sections.

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