Reviews

# Differential diagnosis of cutaneous vascular tumours and malformations; problems of classification

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The practical importance of a workable systematic representation of neoplasms and malformations of the cutaneous vessels is evident by the redundance of attempts to create more or less new classifications of these diseases[1-3]. Each nosologic classification must be a purposeful abstraction from many different biological, morphological, and medical aspects. The main aim is carefully directed therapy[4-6]. The main obstacle on the way to a universal classification is its unavoidably multidimensional nature[5-9]. Important aspects are, for example[5,6]:

I. Afflicted parts of the vascular system, e.g. large or peripheral arteries, veins, lymphatic vessels, several parts, and localisation.

II. Nature of the alterations, e.g. widening, alteration of the wall structures, proliferation of vascular elements.

III. Underlying defects, e.g. defects of neurovasal receptors or innervation, incomplete development or destruction of wall structures, or deranged regulation of endothelial growth.

IV. Causes of these defects, e.g. hereditary gene defects, accidental malformations, infectious, chemical or physical influences.

It is necessary to illustrate the complexity of the problems by example; in the antiquated classification, of Mulliken[2], naevi flammei, i.e. lesions with mere impaired regulation of the capillary width, are mixed up with capillary malformations, as for instance a teleangiectasia hereditaria haemorrhagica (Rendu - Osler). Cavernous angiomas which are late persisting real angiomas, are confused with venous malformations, such as the genuine diffuse phlebectasy (Bockenheimer). Such a confusion may lead to therapeutic errors; some years ago we saw an 8 year old boy who was treated in Spain by irradiation for an "angioma". However, the often so-called "angioma racemosum" is no real angioma, but a malformation, an "angiectasia racemosa". It is possible to stop several forms of real tumour growth by irradiation, angiomas also, but in this arteriovenous malformation with deficient vascular structures, radical worsening was the only possible consequence.

The so-called "Hamburg classification" is very suitable for vascular surgery[6]. The authors try to eliminate the old eponyms. However, it is not possible to characterize malformations with multiple different aspects within this system in a simple way. So they use, for example, terms such as "congenital osteodystrophic and angiodysplastic syndrome of the Klippel-Trènaunay type". In such cases the simple old eponym "Klippel-Trènaunay-syndrome" would have been enough. Indeed, more than 2/3 of the syndromes associated with nevi flammei in our material represented only two "eponym-syndromes"; Klippel-Trènaunay and Sturge-Weber in "classic" forms[4]. In complicated problems not only morphological, but also aetiopathogenetic aspects are to be taken into consideration e.g. "von Hippel-Lindau-syndrome"[8]. So it is obvious that abandoning the old eponyms is not useful. On the other hand, all the combined syndromes are rare in relation to mere solitary port wine strains, 81: 1714 in our material. Maybe, the real ratio is greater, because some small teleangientatic nevi in nonexposed skin are not important for their owners, and are never seen by a doctor.

A comparable problem of recording diagnoses exists in angiomas. For example, 4679 patients were treated in our clinic for growing angiomas of infancy, but within the same time only 143 with tardive (formerly "senile") angiomas. The main reason is the harmless, self-limiting growth of tardive angiomas in adults in contrast to the dynamic growth of capillary hemangiomas in children. In systematic investigations, the incidence of capillary hemangiomas in children is less than 5%, the one of tardive angiomas far higher[10]. The "clinical incidence" of diagnoses does not represent the real incidence.

Combined manifestations of various developmental and neoplastic lesions of the vascular system

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are known from numerous single case reports[1,4,11]. Within the last years, also familiar accumulations were reported[12,13]. A genetic, maybe hereditary lability of multiple components of the vascular system appears to be probable.

Up to now, no single system of classification is equally fit for all purposes. We always have to consider aetiopathogenetic as well as morphologic aspects, location and distribution of lesions with regard to our therapeutic aims. In the last several years, a lot of therapeutic improvements have been developed[6,14,15]. Essential for their purposeful use is a "correct" diagnosis[5,9,16-18]. The essential base for each diagnosis is the clear distinction between mere dilatation (ectasy) and real growth (proliferation). So we have to distinguish the following main groups:

1. Connatal teleangiectatic naevi, colour changes. Cutis marmorata, and Naevi anaemici with deficient neurovasal signal transmission. Acquired teleangiectatic naevi (Fegeler's syndrome) with peripheral or central traumatic damages of vasomotoric parts of the nervous system.

2. Syndromes with teleangiectatic naevi, combined with malformations: von Hippel-Lindau, Sturge-Weber-Krabbe, Klippel-Trénaunay, FP Weber, Bonnet-Déchaume-Blanc, Bregeat Wybom-Mason, Roberts, Beckwith-Wiedemana, Coat, Rubinstein, TAR, Coob, Proteus. etc. Tardive (delayed) angiectatic naevi and combined syndromes: spider naevi, Teleangiectasia haemorrhagica hereditaria Rendu-Osler, Angiectasia serpiginosa, Angiectasia racemosa, Mafucci, blue rubber bleb naevus, diffuse genuine phlebectasy Bockenheimer etc.

3. Angiokeratotic naevi with ectatic peripheral capillaries and secondary involvement of the epidermis, and combined syndromes: angiokeratoma circumscriptum localisatum, angiokeratoma circumscriptum naeviforme Fabry, Angiokeratoma akroasphycticum digitorum Mibelli, angiokeratoma punctiforme scrotis, vulvae Fordyce, angiokeratoma with naevus flammeus and deep vascular malformations, Angiokeratoma corporis diffusum without, and, secondary, Fabry type with enzyme defects etc. The so-called lymphangiomas are also no real angiomas, but lymphectatic malformations (Hygroma cysticum) and lymphangiokeratotic naevi.

4. Acquired angiectatic lesions- for example venous lakes (Bean) or labial ectasia (Pasini) as results of UV-irradiation and damage of the perivasal connective tissue in exposed areas, pseudolymphangiokeratotic lesions in lymphoedema.

5. True angiomatous neoplasms with capilrary proliferation. Most widespread examples are the tardive (senile) angiomas with initial capillary proliferation, self-limiting growth and late cavernous thick-walled differentiation, the bleeding, eruptive angiomas (formerly, and erroneously "pyogenic granulomas", also with self-limiting growth). Most dramatic examples are the progressive angiomas of Darier, the multilocular haemangiomatosis, and, of course, the capillary haemangiomas of childhood and infancy with initial growth and late regression. Real cavernous angiomas are rare in children. They are a late result of thick-walled differentiation in primarily capillary tumours, as delineated by Rudolf Virchow 150 years ago, and they have lost the possibility of regression by this differentiation.

6. Hamatomas of the glomus organs, arteriovenous connections and peripheral parts of the vessel wall,- for example solitary, systematized or familiar multiple glomangiomas and acral arteriovenous tumour Carapeto-Garcia Perez-Winkelmann; angioleiomyoma.

7. Malignant cutaneous vascular tumours are, except haemangiopericytoma, are all uncontrolled proliferative diseases of the vascular endothelia. Many different aetiologic factors are known (more maybe unknown), for example, the combination of HHV 8 viral infections and immunologic defects in Kaposi's sarcoma, lymphoedema in Stewart-Treves syndrome, certain chemical agents, as oligamides as well as ionizing radiation in solitary haemangioendothelioma. Therefore, it is not correct to include all of them as "angiosarcoma". Primary multicentric endotheliomas of the forehead skin, arising exclusively in areas with severe solar damages are very rare. Nearly all patients with this disease die within the first year. This is the tumour with the shortest way to death.

## References

1. Hundeiker M. Fehl- und Neubildungen der Blut- und Lymphgefaesse. Doerr W, Seifert G, Uehlinger E (eds.) Spezielle pathologische Anatomie, vol 7, 2nd. ed. pt. 2, Springer: Berlin 1979 pp. 311-359.

2. Mulliken JB, Glowacki J. Hemangiomas and vascular malformations in infants and children: a classification based on endothelial characteristics. *Plast Reconstr Surg* 1982; **69**: 412-420.

3. Cremer H. Klassiftkation der benignen vaskulaeren Tumoren des Gefaessendothels im Kindesalter. Kautz G, Cremer H (eds.) Haemangiome. Springer: Berlin 1999 pp. 13-40.

4. Hundeiker M, Orlinska K. Systematik der angiektatischen Naevi. Hohenleutner U, Landthaler M (eds.): Operative Therapic im Kindes- und Jugendalter. Blackwell: Berlin - Wien 1997 pp. 95-101.

5. Hundeiker M. Was ist ein Haemangiom, was ist eine Malformation? Zur Differentialdiagnose vaskulaerer Tumoren. Schoenleben K, Hartel W (eds.) Deutsche Gesellschaft fuer Chirurgie, 11. Tagung, Muenchen, 1.-5. Mai 2001. Springer: Berlin 2001 pp. 439-442.

6. Loose DA. Systernatik, radiologische Diagnostik und Therapie vaskulaerer Fehlbildungen. Hohenleutner U, Landthaler M (eds.): Operative Dermatologie im Kindes- und Jugendalter. Blackwell: Berlin - Wien 1997 pp. 79-94.

7. Fernando MS, Kumarasinghe MP. Acquired tufted angioma - a case report and review of the literature. *Sri Lanka Journal of Dermatology* 1998; **3**: 31-33.

8. Hauschild S, Feddersen A, Frahm C, Kreft B, Wallner SJ, Steinhoff J Das von Hippel -Lindau-Syndrom. *Dtsch Med Wschr* 1995; **120**: 970-974.

9. Requena L, Sangueza OP. Cutaneous vascular proliferations. Part III. Malignant neoplasms with significant vascular component, and disorders erroneously considered as vascular neoplasms. *J Am Acad Dennatol* 1998; **38**: 143-157.

10. Goldann G, Smolin T, Lippold A, Hundeiker M. Tardive (senile) Angiome. *Z Hautkr* 1992; **67**: 718-720.

11. Rupprecht R, Hundeiker M. Cutis marmorata teleangiectatica congenita. *Hautazt* 1997; **48**: 21-25.

12. Blei F, Walter J, Orlow SJ, Marchuk DA. Familial segregation of hemangiomas and vascular malformations as an autosomal trait. *Arch Dermatol* 1998; **134**: 718-722.

13. Garzon MC, Enjolras O, Frieden IJ. Vascular tumors and vascular malformations: Evidence for an association. *J Amer Acad Dermatol* 2000; **42**: 275-279.

14. Bassukas ID, Abuzahra F, Hundeiker M. Regressionsphase als therapeutisches Ziel der kryochirurgischen Behandlung wachsender kapillaerer Saeuglings-Haemangiome. *Hautarzt* 2000; **51**: 231-238.

15. Poetke M, Philipp C, Berlien HP. Die Behandlung von Haemangiomen im Saeuglings- und Kindesalter mit dem blitzlampengepumpten Farbstofflaser. *Hautarzt* 2001; 52: 120-127.

16. Brinkmann A, Traupe H. Vaskulaere Anomalien. Traupe H, Hamm H (eds.): Paediatrische Dennatologie. Springer: Berlin-Heidelberg-New York 1999 pp. 135-144.

17. Kautz G, Weinhofer F, Bahmer FA. Diagnostische Moeglichkeiten bei Haemangiomen. Kautz G, Cremer H (eds.): Haemangiome. Springer: Berlin-Heidelberg-New York 1999 pp. 41-53.

18. Requena L, Sangueza OP. Cutaneous vascular anomalies. Part I. Hamartomas, malformations and dilatations of preexisting vessels. *J Am Acad Dermatol* 1997; **37**: 523-549.