Arteriovenous communication of the iris

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SUMMARY A case of arteriovenous communication of the iris in the left eye of a 45-year-old man is reported. The haemodynamic changes and differential diagnosis of this kind of communication are briefly discussed.

Haemangiomas of the iris are extremely rare.1-4 They are usually capillary5,15 or cavernous haemangiomas7,8 but so-called racemose haemangiomas are observed very rarely.9 This lesion is not a true tumour but a vascular anomaly. It consists of abnormal, direct, bypassing capillary bed communications between more or less fully developed, dilated, and tortuous arteries and veins.9,10 Some authors have therefore recently suggested that the term racemose haemangioma or racemose aneurysm should be replaced by arteriovenous communications10 or arteriovenous anastomoses.10

It seems that arteriovenous communications are a congenital anomaly.11 Their pathogenesis is unknown, but they probably arise from a local defect in the maturation of the primitive mesenchymal cells. In the early stages of development of the vascular system, for example in the retina, primitive mesenchymal cells differentiate into solid cords of endothelial cells which gradually become canalised to form a primitive capillary network.12 As blood enters this network, the primitive vessels develop into arteries, veins, and connecting capillaries, with the simultaneous retraction and atrophy of some primitive capillaries.13 In arteriovenous communications extensive capillary retraction and atrophy may occur, with development of a single channel to shunt blood across this defective capillary zone.14

Because of their slow development, arteriovenous communications are usually encountered for the first time in the second or third decade of life.14-16 Lesions occur mainly in the retina,4,11,12 and less frequently in the orbit, conjunctiva, and sclera.4,16,17 There are very few reports of arteriovenous communications in the iris.9 In view of the rarity of this lesion the case described here was considered worth reporting.

Case report

A 45-year-old man was admitted to this clinic because of a vascular anomaly of the left iris. The patient said he had noticed red spots on the iris about 15 years before. As he had no disturbance of vision, he did not consult an ophthalmologist.

Ocular examination showed: in the right eye, visual acuity 1-0, IOP 15 mmHg, anterior segment and fundus normal, visual field normal; in the left eye, visual acuity 1-0, IOP 15 mmHg. A dilated episcleral vessel coursing towards the corneal limbus was seen at 2 o'clock (Fig. 1). It entered the sclera at 3 o'clock.

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Fig. 1 Appearance of sclera and iris with arteriovenous communication.
Arteriovenous communication of the iris

1 mm from the limbus. The dilated vessel could be seen subsequently gonioscopically in the anterior chamber angle, and it entered the surface layers of the iris stroma. After entering the angle the vessel became wider and more tortuous as compared with its episcleral segment. It then coursed towards the pupillary border of the iris, where it formed a conglomerate of greatly dilated and tortuous vessels (Fig. 2). Above this vessel another one slightly less dilated and tortuous could be seen. From the conglomerate of vessels at the pupillary border of the iris a dilated and tortuous vessel emerged, the course of which was only partially seen because it penetrated deeper into the iris stroma. This vessel disappeared within the anterior chamber angle and reappeared as a dilated episcleral vessel in the corneal limbus. No other ocular changes were found besides those described within the anterior segment. The visual field was normal.

Fluorescein angiography of the iris enabled us to delineate accurately the course of the altered vessels and to determine the afferent and efferent part of the communication (Figs. 3A, B, C). The dilated and tortuous iris vessel at 3 o'clock was the first to fill.
This vessel then divided into several branches which in their course formed a conglomerate of greatly
dilated and tortuous vessels. They were seen not only
in the peripupillary part of the iris but also in its
medial part, which could not be seen in the slit-lamp.
At 2 o'clock a slightly dilated vessel was observed
which filled with fluorescein slightly later than the
vessel at 3 o'clock. From the vessel conglomerate at
the iris margin a dilated vessel emerged which
coursed towards the corneal limbus at 5 o'clock. In
the part of the iris in which the anomaly occurred the
vessels filled later than in the other parts. Moreover
in that part fewer vessels were shown up by
fluorescein even in the late phases of the examina-
tion. During the examination a small leakage of dye
from the vessels forming the arteriovenous com-
munication could be observed. However, this leak-
age may have been at least in part an artefact owing to
the vessels of the iris being slightly out of focus in the
camera. Such artefacts have been reported. Fluorescein
angiography of the left fundus was normal.

When the intraocular pressure was increased by
means of the ophthalmodynamometer, pulsation of the
arteriovenous communication as well as of the
afferent and efferent vessels could be observed at
a pressure above 90 mmHg.

Neurological examination did not show any
alterations indicating changes in the central
nervous system. The patient was therefore not
considered suitable for carotid angiography.

Discussion

The lesion found in this patient corresponds to the
arteriovenous communications usually observed
within the retina. As in the retina, dilated afferent
and efferent vessels, which had already been noted in
the episclera, as well as a mass of convoluted
channels between them could also be distinguished
here. The appearance of this vascular disorder, as
well as the fact that pulsation of the afferent and
efferent vessels occurred almost at the same level as
the raised intraocular pressure, indicates that this
arteriovenous communication can be included in group
2 of the classification of Archer et al. The angiog-
graphic evidence of slight leakage of fluid from the
vessels involved as well as of reduced perfusion of the
iris in the sector where the lesion lay, pointed to the
existence of some, though not intense, decompensa-
tion of the arteriovenous communication. It accounts
also for the fact that this communication can be
included in group 2 of Archer et al. Because of the
small number of reported cases of arteriovenous
communications in the iris it is of course difficult to
say whether the division into three groups introduced
for pathological alterations in the retina will also
apply to lesions in the iris.

In the available literature only a few descriptions of
this kind of lesion in the iris have been found. A
similar case to that presented here was described by
Stur and Strasser. A case presented by Ida Mann
which was diagnosed as congenital angioma of the iris
may also have been one of arteriovenous com-
munication. A case of vascular anomaly of the iris
was also described by Savir and Manor, but, since
that abnormality did not have afferent and efferent
vessels, it cannot be regarded as an arteriovenous
communication.

Arteriovenous communications of the iris need to
be differentiated mainly from secondary vascular
alterations occurring in the course of various diseases
of the iris. Dilated and tortuous vessels of the iris are
observed in association with cysts and melanomas of
the iris. Other lesions, such as ruberosis iridis or
microhaemangiomas of the pupillary border can
be easily distinguished from arteriovenous
communications.

Owing to the asymptomatic course of the disease in
the patient reported on here no treatment was
applied. If complications arise, such as spontaneous
hyphaema, the possibility of performing photoocoagu-
lation can be considered.

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Accepted for publication 11 February 1986.
Arteriovenous communication of the iris.

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*Br J Ophthalmol* 1986 70: 856-859
doi: 10.1136/bjo.70.11.856

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