Arteriovenous Fistula of the Eyelid: Secondary to a Chalazion

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Arteriovenous fistulas are well known to occur in the eye region in many variations.\(^1\)\(^2\) They are characterized by an abnormal communication between an artery and a vein. They may consist of a few simple shunts with arterialization of the vessels on the venous side on one extreme or they may be composed of multiple communicating and tortuous blood vessels forming a pulsating mass on the other extreme. They may represent a congenital abnormality due to the persistence of embryonic vascular channels or they may be the result of different kinds of trauma. All arteriovenous fistulas have a high rate of flow of arterial blood and, thus, they always are a challenge to the diagnostic and surgical skills of the ophthalmologist.

The head and neck region is the most common location for congenital arteriovenous fistulas while the posttraumatic type most frequently occurs in the extremities involving large vessels such as the popliteal artery and vein, for example. To report the occurrence of an arteriovenous fistula that developed in the region of a chalazion in a previously normal eyelid of a 21-year-old lady is the purpose of the present paper.

CASE REPORT

This 21-year-old White female was first seen in my office on 4-21-76 with a lump in the medial aspect of her left upper eyelid. This lump was first noticed by the patient four or five years before. It had started as an infection in the upper eyelid and it had, at first, been very red and painful. With the clearing of the swelling, redness and pain of the whole lid, a localized tumor had persisted, however, and the patient believed it to be increasing in size.

The patient was in the third month of a normal pregnancy when she was first seen. She was of excellent general health and had no other tumors or problems. Vision was 20/20 and J 0 in both eyes without correction. External examination immediately revealed the pea-sized tumor in the left upper eyelid (Fig. 1). This was slightly red and exhibited large and tortuous blood vessels which were visible through the thin lid skin. Eversion of the left upper lid revealed what appeared to be an old chalazion with localized redness and scarring on the inside of the externally visible lid tumor. The remainder of the eye examination was normal.

A diagnosis of a chronic chalazion with reactive dilation of the overlying blood vessels was made and the patient was directed back to the referring eye doctor for removal of the chalazion from the inside of the lid. This was attempted on 5-7-76, but very extensive bleeding occurred as soon as the first incision had been made on the inside of the left upper eyelid for the

![Fig. 1. The chalazion of the present patient with some enlarged blood vessels showing through the upper lid skin. (Photograph)](image-url)
removal of the chalazion. The operation was
terminated and the lid lesion persisted, but it
became painless and was no longer irritating.
The patient came back to see me on 11-11-76,
presenting with a vascular tumor in the same
area of the left upper eyelid. The chalazion-like
inflammatory reaction on the tarsal side of the lid
had healed. Conservative management was
advised with the thought that the suspected
reactive vascular engorgement in the lid would
disappear spontaneously after the chalazion had
healed. This did not happen, however, and the
vascular lid lesion enlarged instead.

On 1-26-77, the patient exhibited a
hemangioma-like tumor under the skin of the
inner aspect of her left upper lid (Fig. 2). This
showed radiating blood vessels of relatively large
size and tortuous course to lead in all directions
— some of these blood vessels were visible
through the lid skin all the way to the lateral
aspect of the upper lid as well as to the region of
the eyebrow. This vascular lesion was no longer
associated with any sign of inflammation of lids
or conjunctiva. The vascular tumor was cos-
metically disturbing to the patient and it gave her
a “heavy feeling” in the eyelid. A secondary
arteriovenous fistula of the upper lid was con-
sidered the most likely diagnosis. Surgical
removal of the lesion was recommended.

A horizontal skin incision was made over the
lesion in local anesthesia on 1-27-77. An
accumulation of large and tortuous blood vessels
was found in the layer of the orbicularis oculi
muscle. Immediately, there was extensive
bleeding. After separating the conglomeration of
intertwining blood vessels by spreading scissors
with blunt tips the relatively large feeder artery
was found, clamped and tied with catgut. This
caus ed collapse of the mass and this could be
excised in several pieces. Additional bleeding
feeder vessels were tied or closed with cautery. Deep
character stitches were placed to reunit e the
muscle layer before the skin was closed. The
postoperative course and healing were un-
complicated. When the patient was seen again on
2-3-77 for suture removal, it was already obvious
that she was cured of her problem. The tumor was
gone and with it all the enlarged blood vessels,
that were surrounding the tumor had dis-
appeared (Fig. 3).

Histopathological study supported the diag-
nosis of arteriovenous fistula in this upper eyelid
lesion. The three removed pieces of tissue each
measuring about 5 mm in diameter were found to
exhibit a central part composed of the large
feeder artery, several smaller arteries, and a
convolution of arterialized veins (Fig. 4). Scar
tissue filled the spaces around and between the
large vessels. Muscle tissue surrounding the
center of the lesion contained a great number of
enlarged veins (Fig. 5). Mononuclear inflamma-
tion was seen in some parts of the central scar,
but there was nothing to support the diagnosis of
an active chalazion.

DISCUSSION
In the final stages the typical “caput medusae” appearance of arteriovenous
fistulas in the lid of the present case made
an a correct diagnosis relatively easy. In the earlier stages the combination of the signs of a typical chalazion mixed with those of a developing arteriovenous fistula were confusing and prevented me from recognizing the true nature of the process.

The patient and her relatives are certain that the eyelid was completely normal in the past and that all the difficulties started with the inflammatory process of the chalazion. The chalazion healed and the arteriovenous fistula developed under my observation. It may be of some significance that the patient was pregnant at that time.

It is common knowledge that pyogenes granulation tissue will sometimes finally result in vascular lesions that resemble small cavernous hemangiomas or arteriovenous fistulas. A relatively large fistula of this type with extensive blood flow and obvious involvement of the blood vessels of the whole lid appears to be unusual. Necrosis within the chalazion was the most likely cause of the original arteriovenous shunt that lead to the complex fistula in the present case. Elimination of the feeder arteries combined with excision of the vascular mass was again found to be successful.

SUMMARY

An arteriovenous fistula developed on the surface of a chronic chalazion on the upper eyelid of a 21-year-old patient during pregnancy. Surgical removal of the vascular mass with ligation of the feeder arteries resulted in a complete cure.

REFERENCES