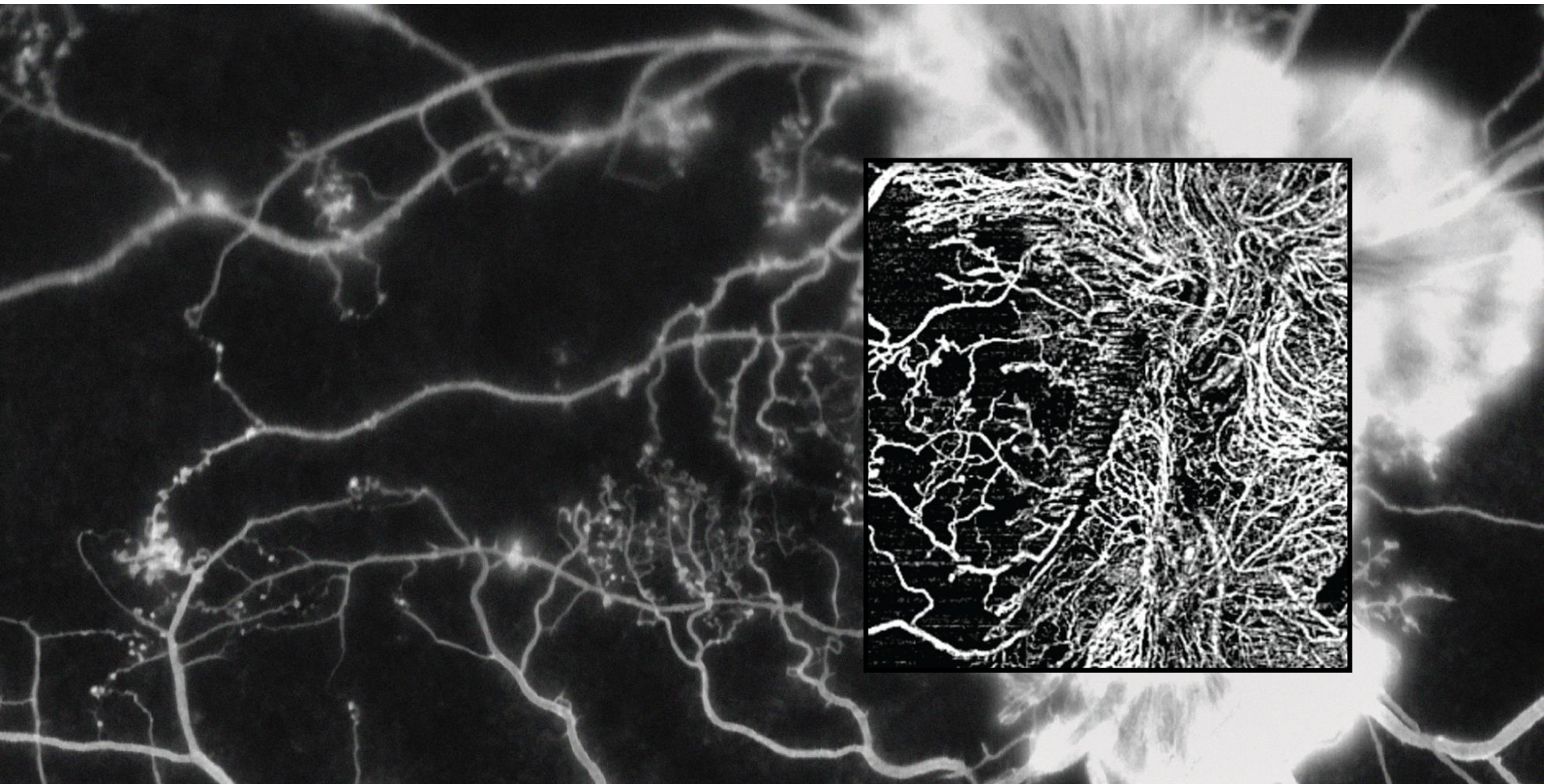


A structure-oriented introduction to the diagnosis of OCT angiograms



Basics of OCT Angiography

Today, modern imaging techniques such as high-resolution optical coherence tomography (OCT) are firmly anchored in everyday clinical practice. Fast and non-invasively executable, they support diagnosis and therapy planning for a large number of pathological changes.

OCT Angiography based on this technique makes it possible to non-invasively detect the blood circulation of the retina and the choroid on the microscopic scale. This thus selectively supplements the spectrum of diagnostic imaging modalities.

Like any new technology, OCT Angiography also requires a learning curve in the clinical evaluation of the exposures. Particularly the three-dimensional nature of the data sets presents new challenges to the viewer. With the right basic knowledge, the latter can, however, be reliably controlled.

The present interpretative guideline should guide you through your first steps in the evaluation of OCT angiograms and provide you with a practical guideline for handling these seemingly innovative and medically fascinating images.

*Dr. Jörg Pintaske
Director Academic Sales & Marketing*

joerg.pintaske@zeiss.com

The contents of this interpretation guide have been developed in collaboration with Dr. Britta Heimes and Dr. Georg Spital (St. Franziskus Hospital, Muenster, Germany) and Prof. Dr. Gabriele E. Lang (University Hospital Ulm, Ulm, Germany). We thank them for their expertise and contribution and for continued commitment to education in OCT Angiography.

Basics of OCT Angiography

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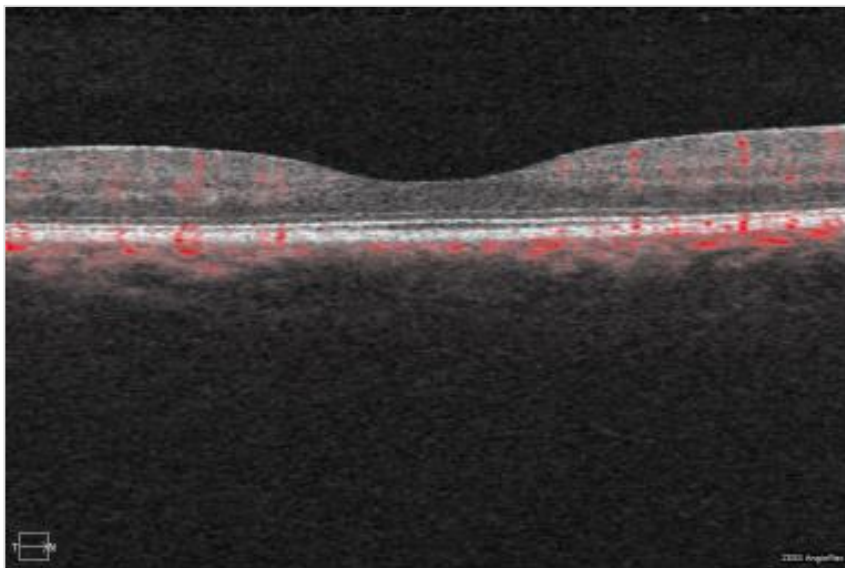


ZEISS CIRRUS AngioPlex™

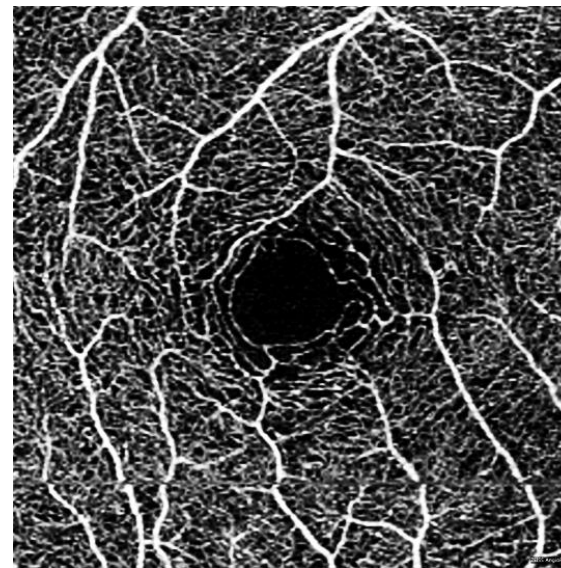
OCT Angiography

OCT Angiography detects temporal changes in the OCT signal

Optical coherence tomography (OCT) describes **spatial differences** in the reflection behavior of the individual layers of the retina. OCT Angiography (OCT-A) is based on OCT technology and displays **temporal changes** in reflection behavior within these layers (e.g. through moving particles such as erythrocytes in blood vessels).



OCT cross sectional image with superimposition of OCT Angiography signals (red color marking)

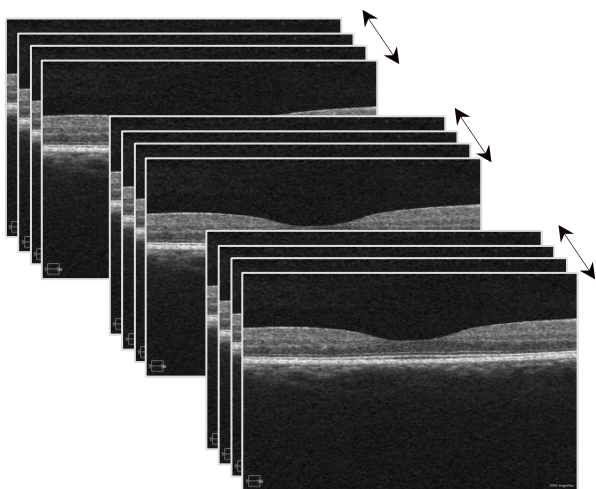


OCT Angiogram

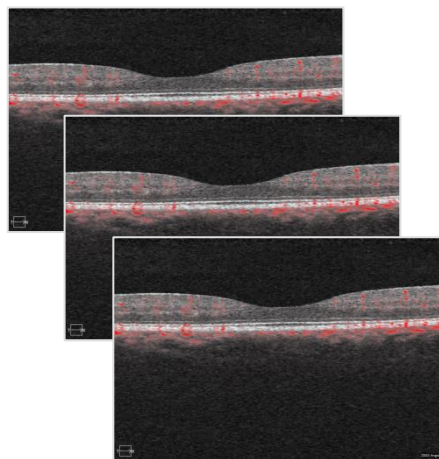
OCT Angiography

OCT Angiography detects temporal changes in the OCT signal

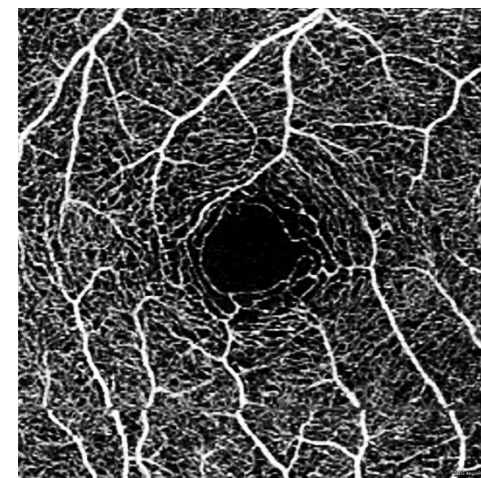
Proof of these signal changes is provided by comparing OCT sectional images repeatedly acquired at a single location of the retina. This makes it possible to produce an image contrast between the vascular structures and the surrounding tissue. Due to the lack of movement, the latter shows no temporal changes in the OCT signal.



Sectional images repeatedly scanned in a single position



Sectional images repeatedly scanned in a single position



Two-dimensional representation

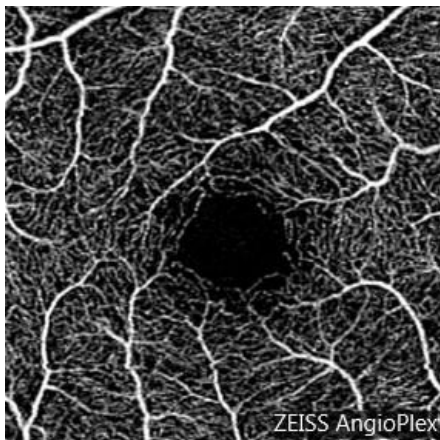
OCT Angiograms

Projection representations of selected layers of the retina

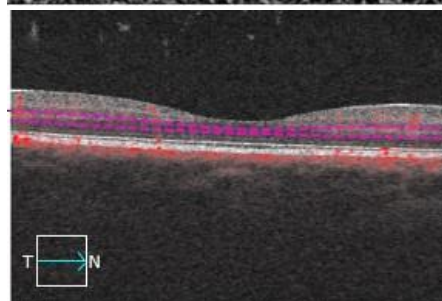
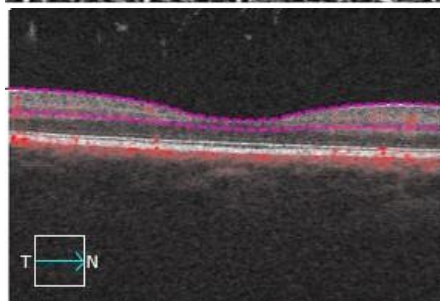
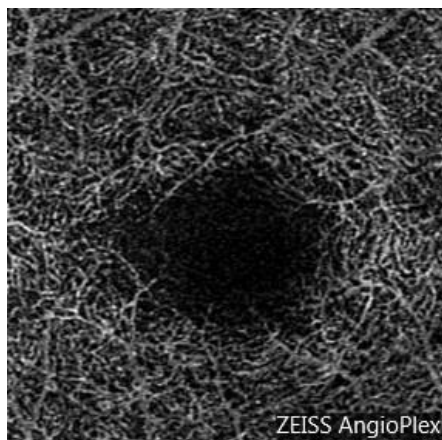


In the case of OCT-A images, a selected area is viewed which is clearly delimited by the segmentation lines in the OCT sectional view. Within this area, all signals along the direction of the OCT beam are summed and displayed two-dimensionally.

Superficial vascular plexus



Deep vascular plexus



Review

Layers of the retina in the OCT



Content

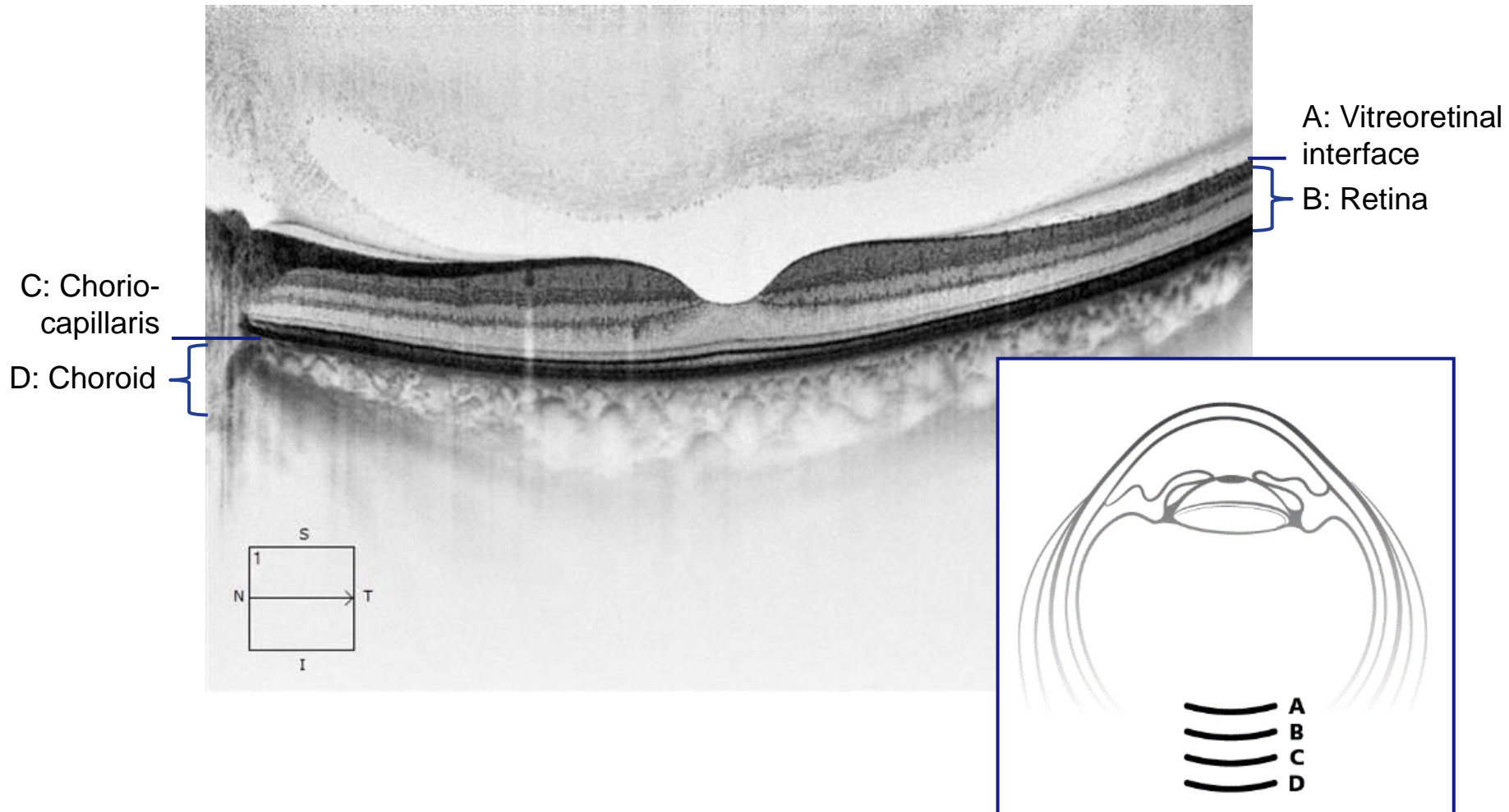


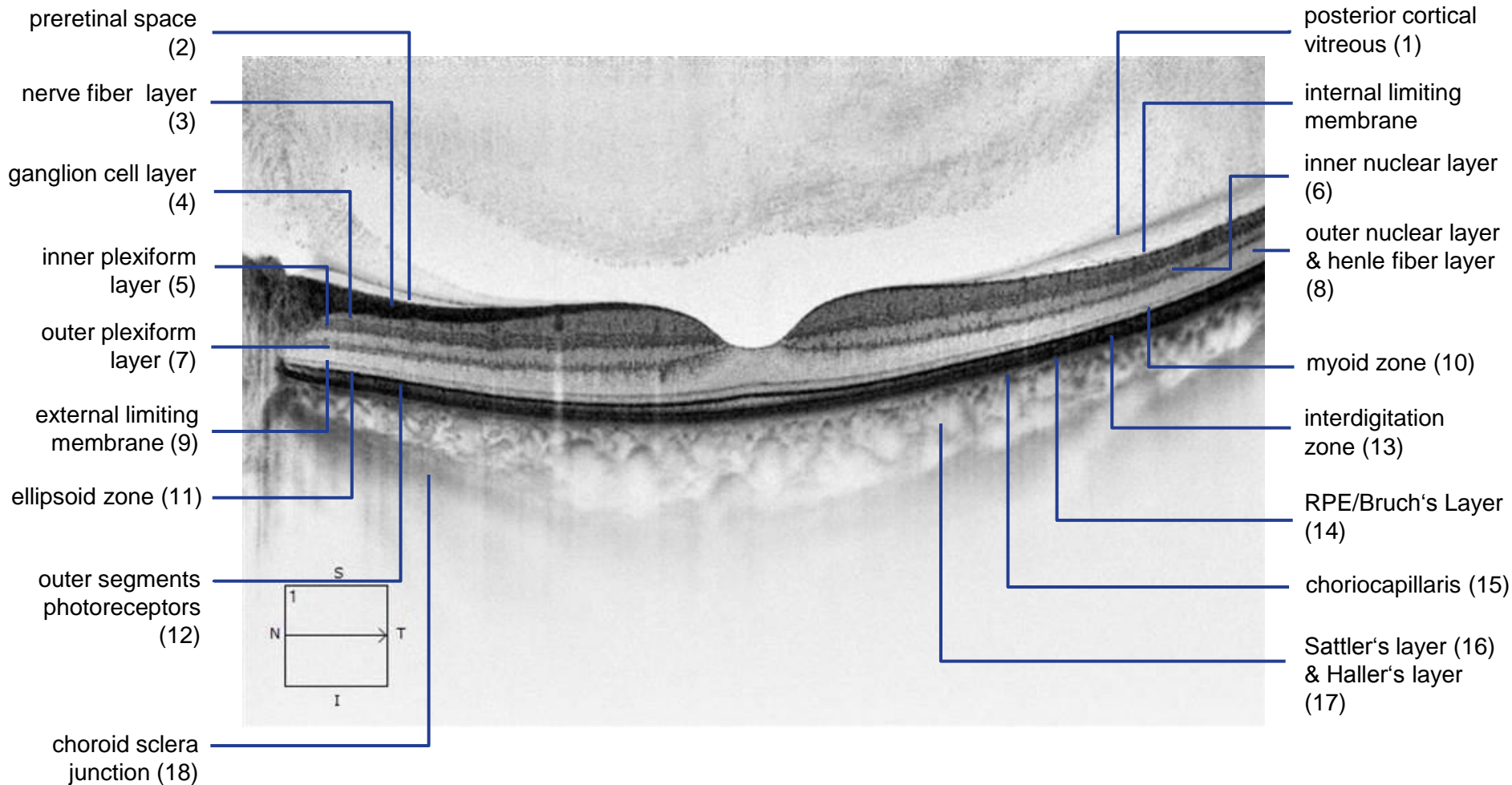
Illustration is subject to copyright. Carl Zeiss Meditec, AG

Review

Layers of the retina in detail

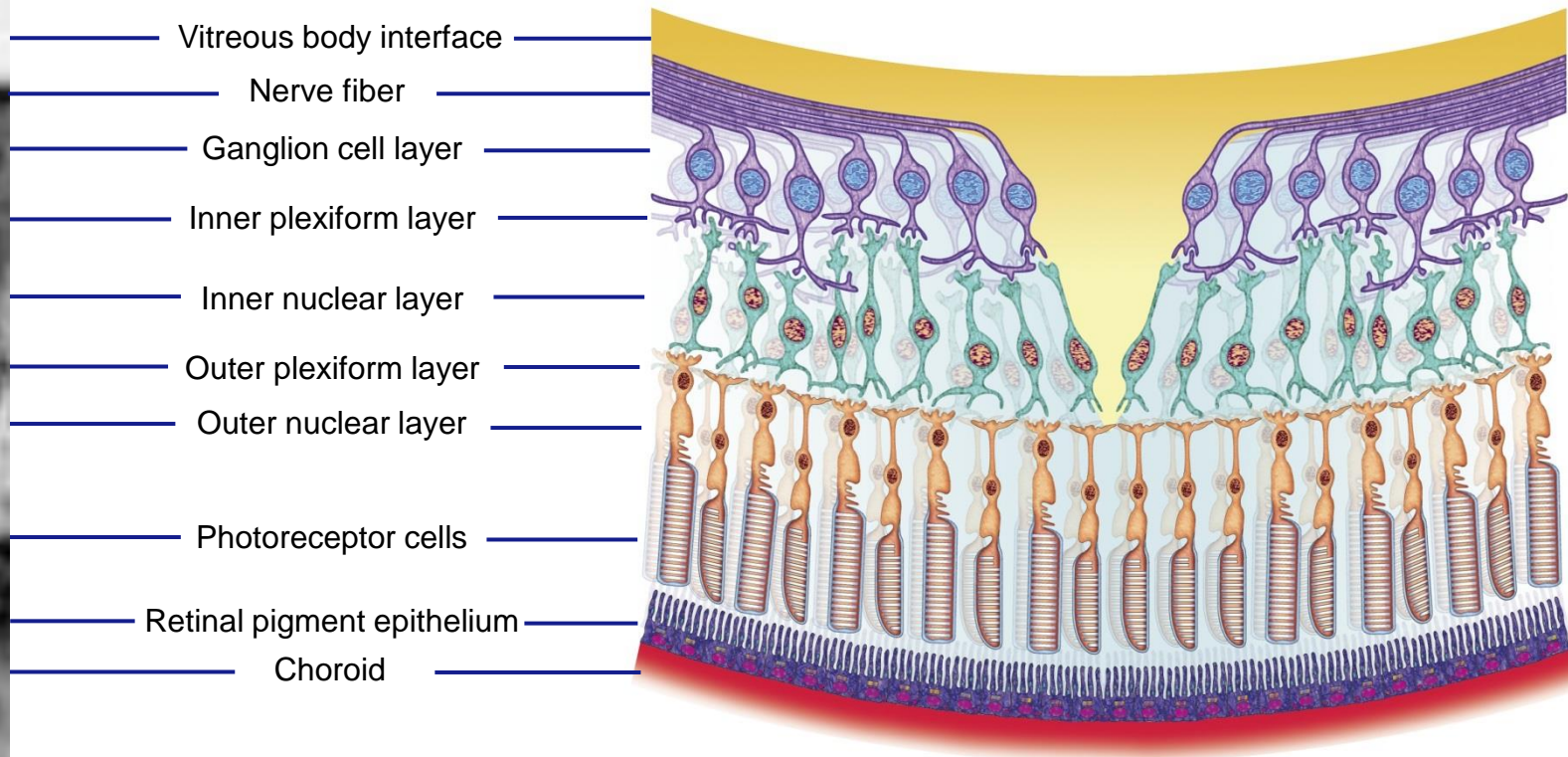
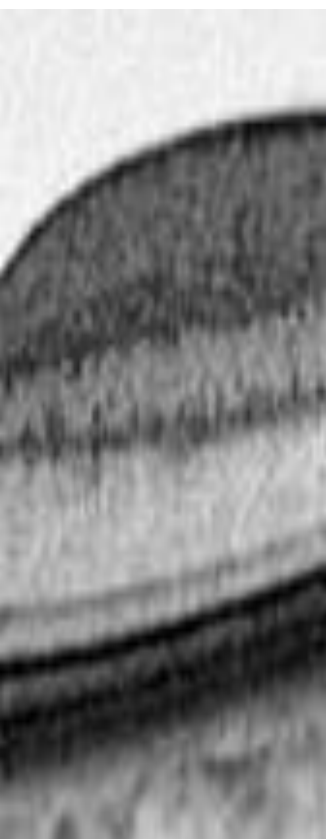


Content



Review

Layers of the retina in detail



Overview OCT Angiograms

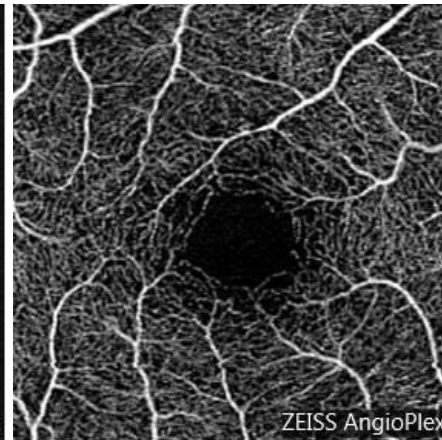


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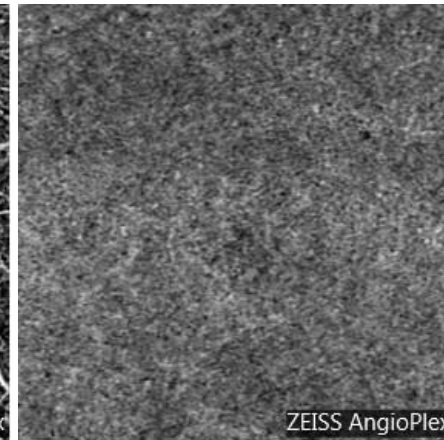
Vitreoretinal
interface



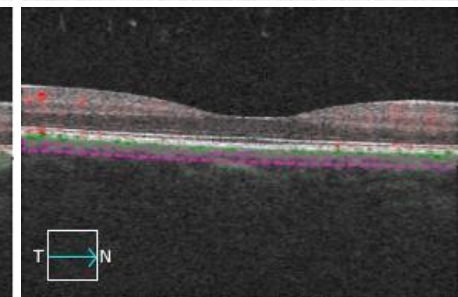
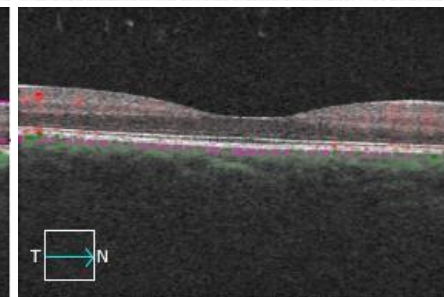
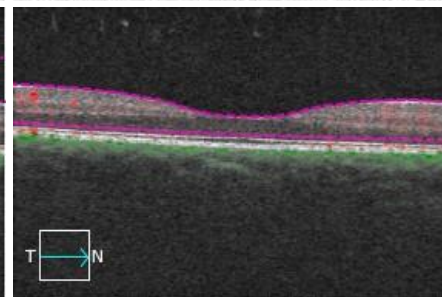
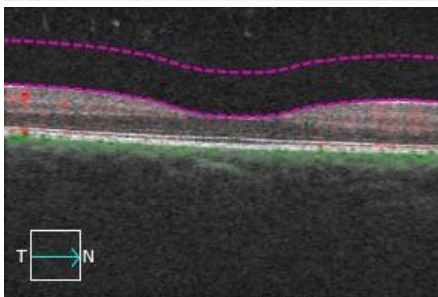
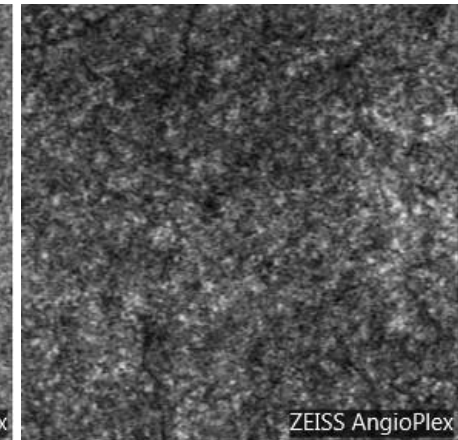
Retina



Choriocapillaris



Choroid



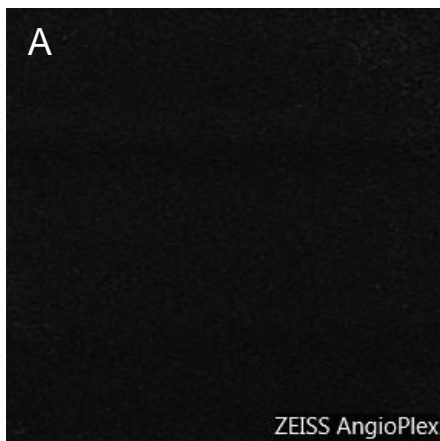
Overview

Vitreoretinal interface

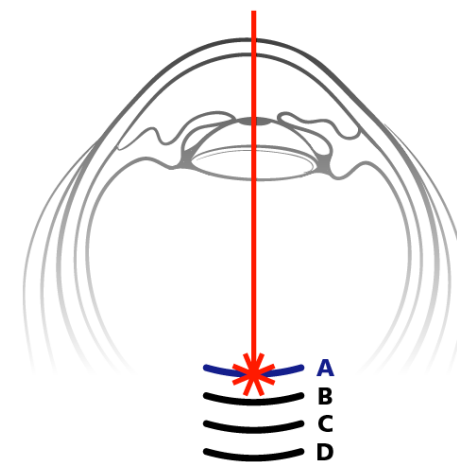
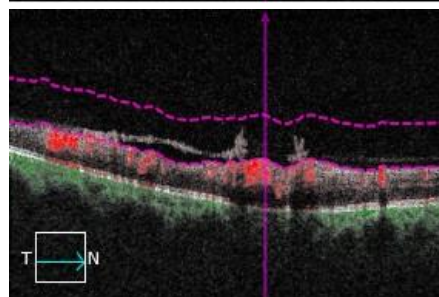
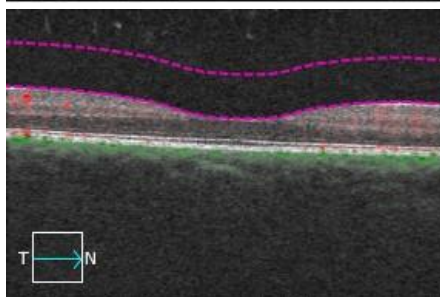
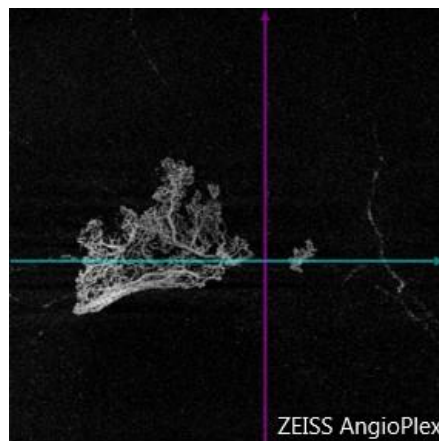


This representation permits analysis of the vitreoretinal interface. In normal findings no vascular structures are displayed there. In OCT angiography, verifiable vascular networks always indicate a pathological change on the vitreoretinal interface.

Normal



Neovascularizations on the vitreoretinal interface



Inner limit: 300 μm above the internal limiting membrane (ILM)
Outer limit: Internal limiting membrane (ILM)

Overview

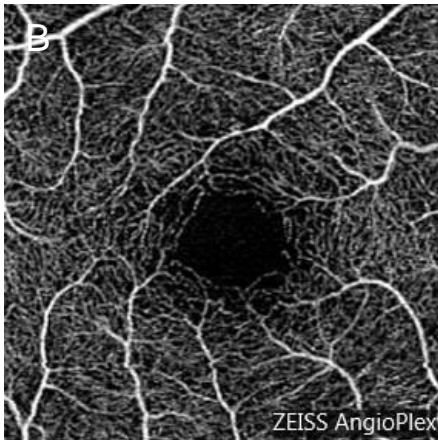
Neurosensory retina



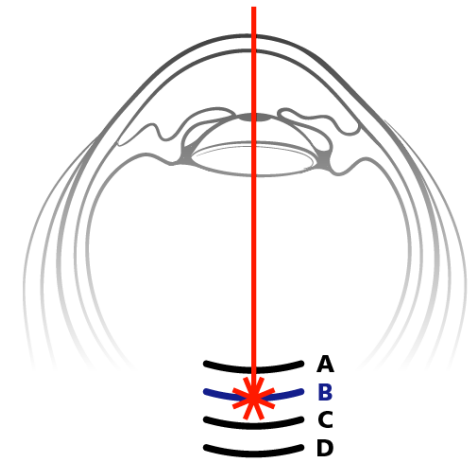
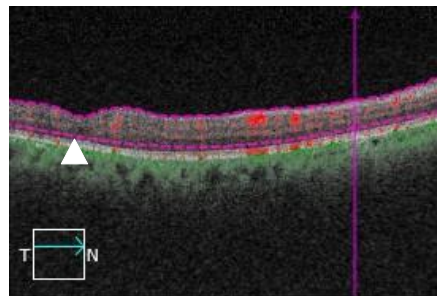
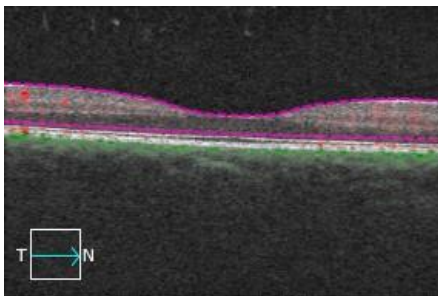
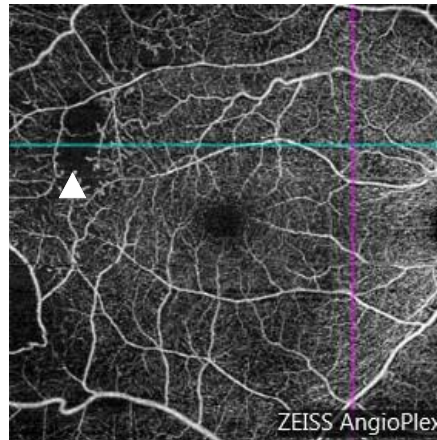
This representation examines the neurosensory retina. This provides an initial complete overview of pathological changes within the retina, e.g.

- Damage to vascular networks (e.g. ischemic areas, see arrow)
- Ingrowths of pathologically changed vessels from the choroid

Normal



Diabetic retinopathy



Inner limit: Internal limiting membrane (ILM)
Outer limit: 70 μ m above Bruch's membrane

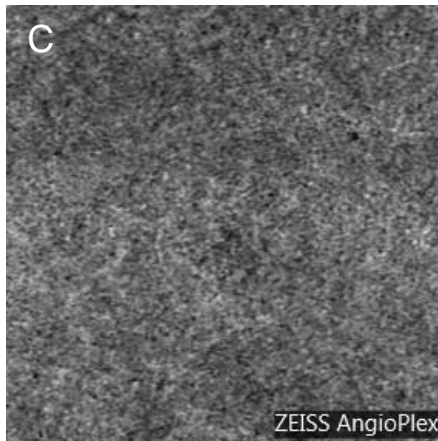
Overview

Choriocapillaris

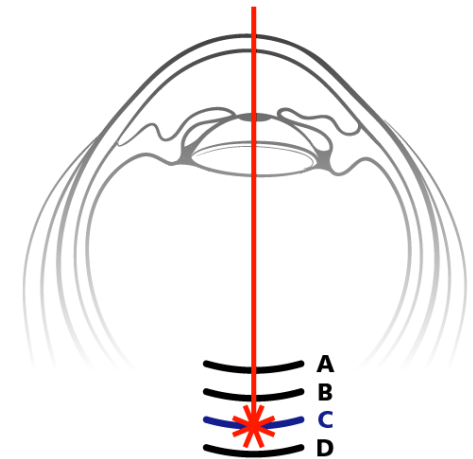
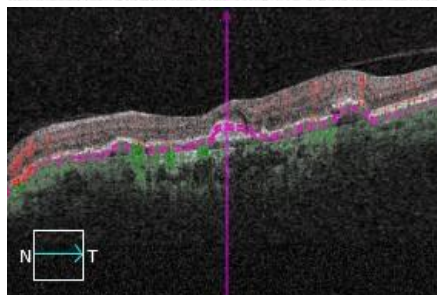
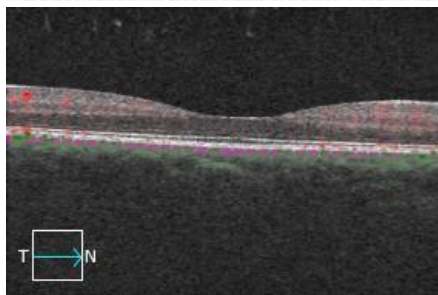
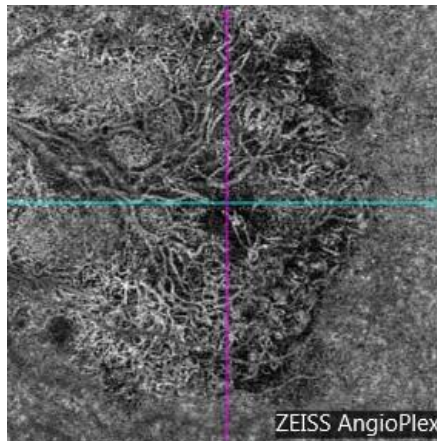


The choriocapillaris is a thin vascular layer which is only several micrometers thick and, in normal findings, exhibits a regular, homogeneous and netlike vascular pattern. In the case of pathological changes such as the occurrence of neovascular structures, significant deviations from this homogeneous pattern occur.

Normal



Choroidal neovascularization



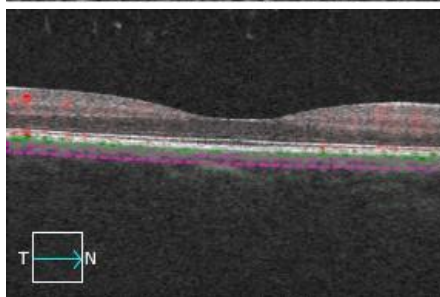
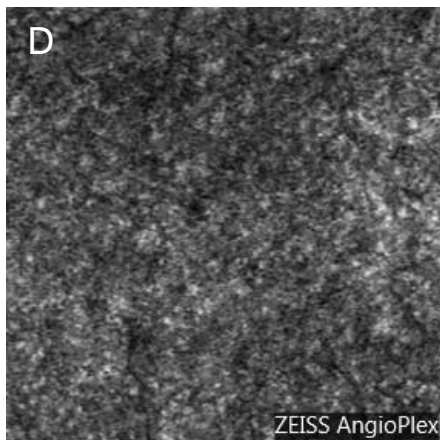
Inner limit: 29 μm below RPE
Outer limit: 49 μm below RPE

Overview Choroid

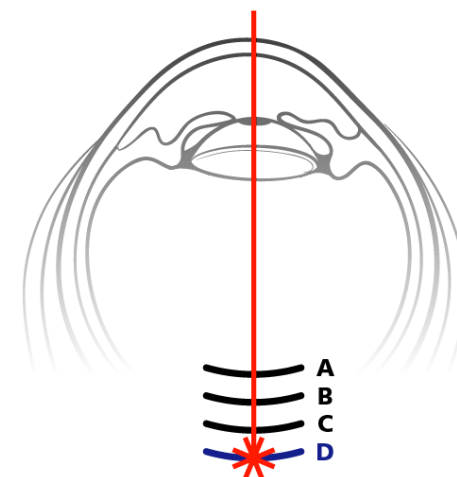
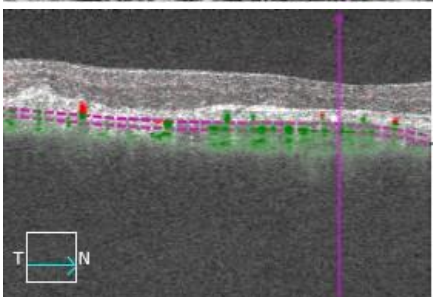
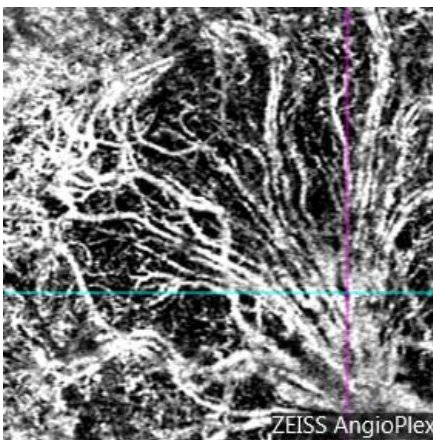


With normal findings in OCT-A, the choroid exhibits a regular, homogeneous and relatively dense vascular pattern. In the case of pathological changes, for instance the occurrence of neovascular vessel structures, significant deviations from this homogeneous pattern appear.

Normal



Choroidal neovascularization



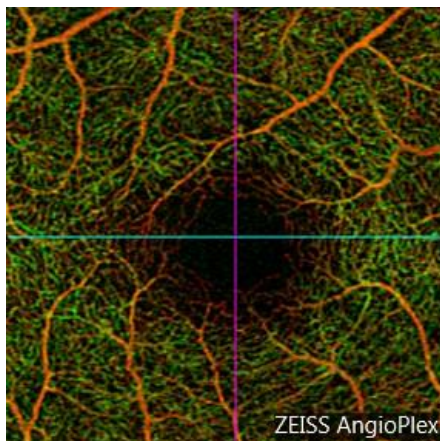
Inner limit: 64 μm below Bruch's membrane
Outer limit: 115 μm below Bruch's membrane

Detailed analysis Layers of the retina

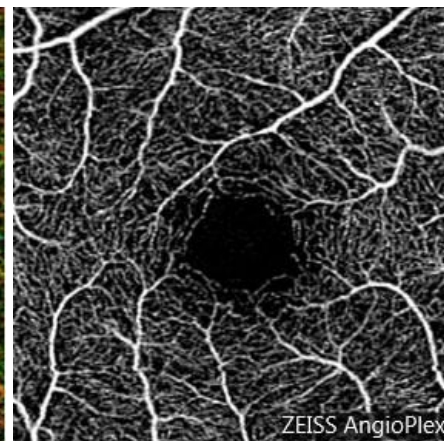


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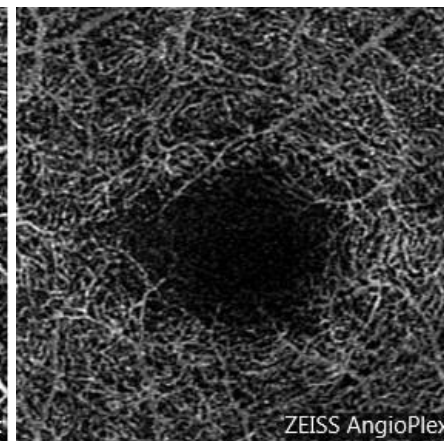
Retina
(color coded)



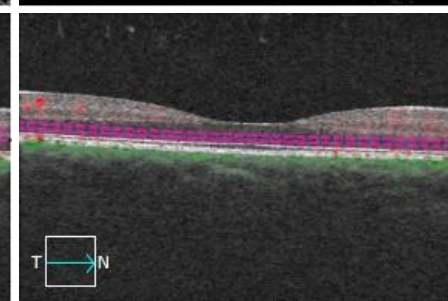
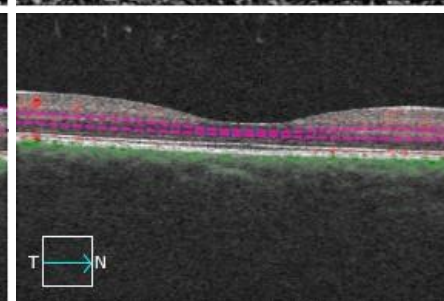
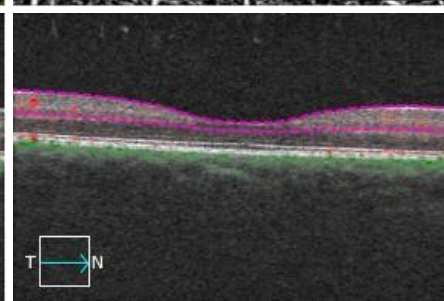
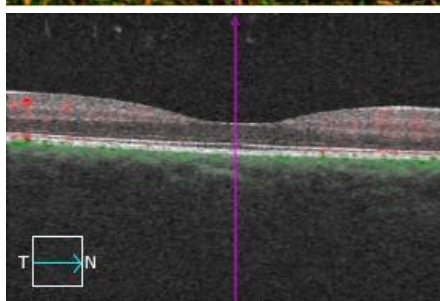
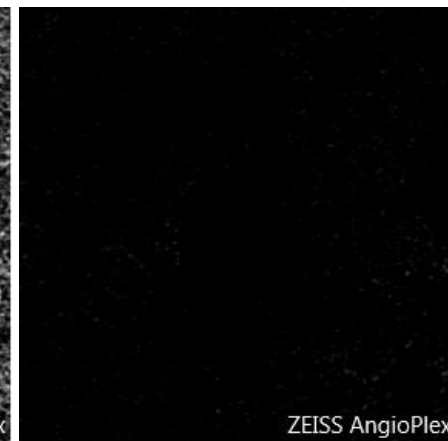
Superficial
vascular plexus



Deep
vascular plexus



Avascular
zone



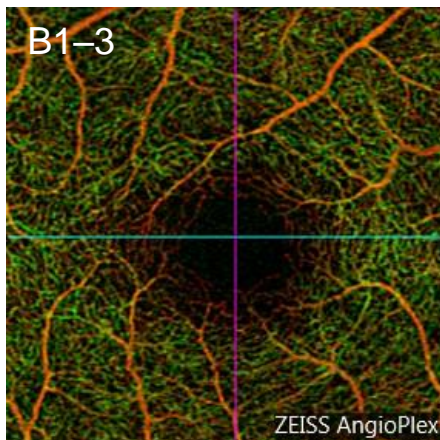
Detailed analysis

Neurosensory retina (color coded)

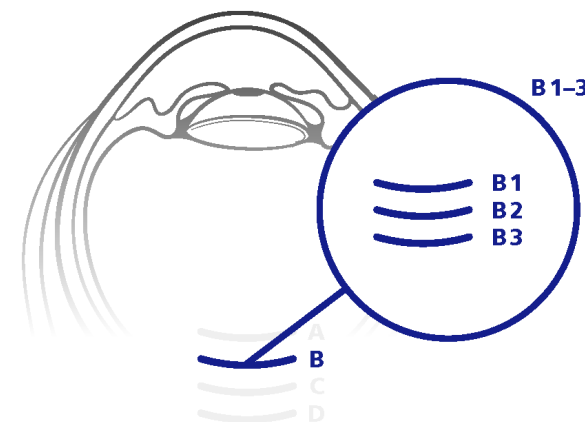
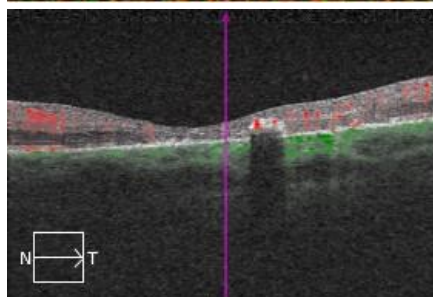
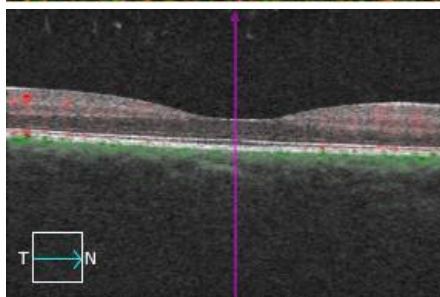
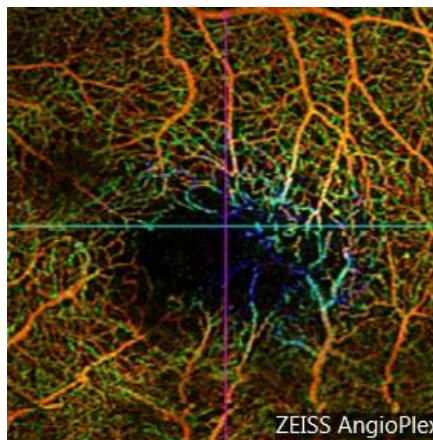


In this representation, different vascular networks are highlighted in color: superficial plexus = red, deep vascular plexus = green, avascular area = blue. In normal findings, only the red and green components of the superficial and deep vascular plexus appear. Changes in this color distribution enable the localization of pathological changes via depth selection.

Normal



Macular telangiectasia



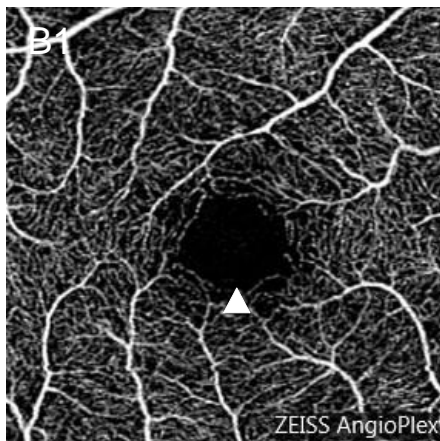
Inner limit: Internal limiting membrane (ILM)
Outer limit: 70 μ m above Bruch's membrane

Detailed analysis

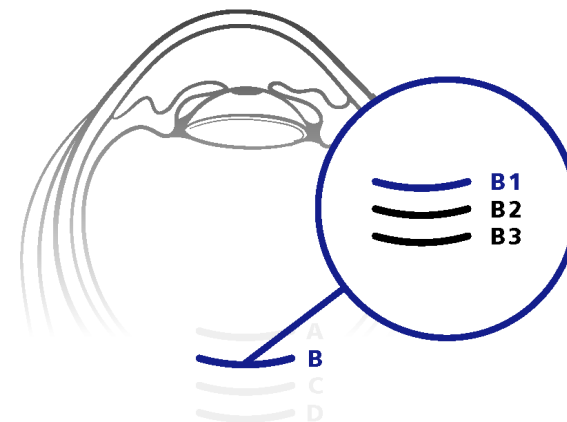
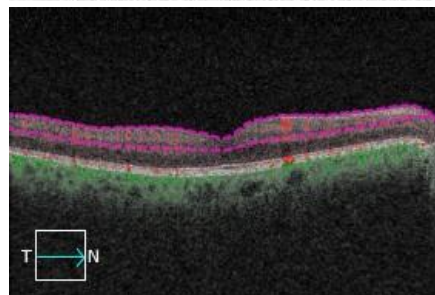
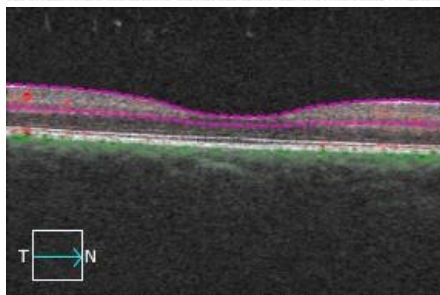
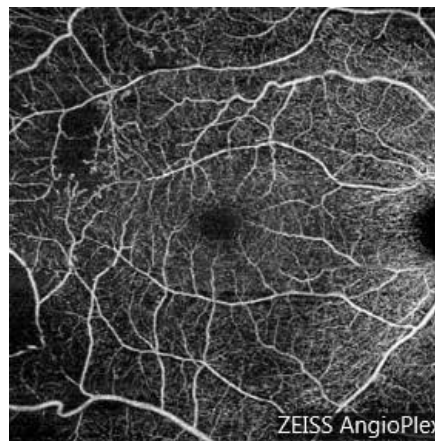
Superficial vascular plexus

With normal findings, the superficial vascular plexus is displayed as a fine capillary network with a strong signal. Especially the large vessels define a characteristic vascular pattern. The area of the fovea does not display any capillary structures (foveal avascular zone, FAZ, see arrow).

Normal



Diabetic retinopathy



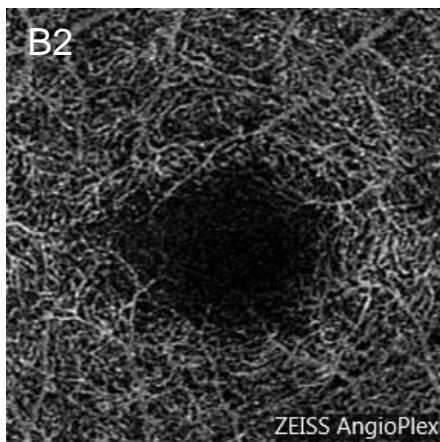
Inner limit: Internal limiting membrane (ILM)
Outer limit: Inner plexiform layer

Detailed analysis

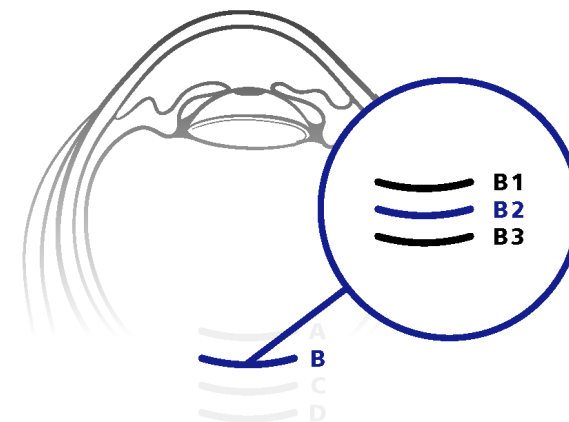
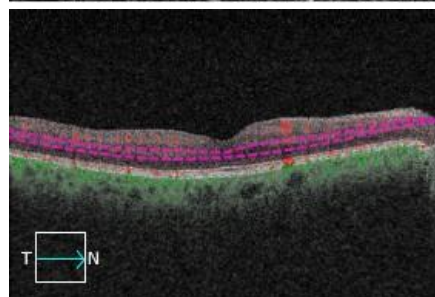
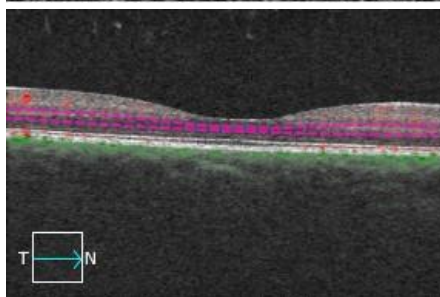
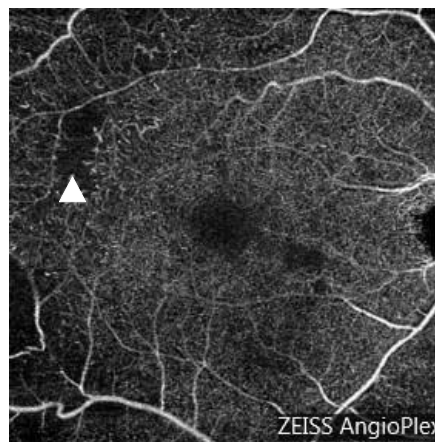
Deep vascular plexus

The deep vascular plexus exhibits a very dense and branched capillary network. With normal findings, this ranges up to and into the perifoveal area. The following case study shows perfusion disruptions in the deep vascular plexus (see arrow).

Normal



Diabetic retinopathy



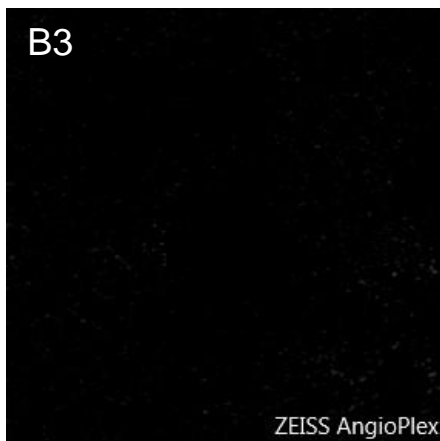
Inner limit: Inner plexiform layer
Outer limit: Outer plexiform layer

Detailed analysis

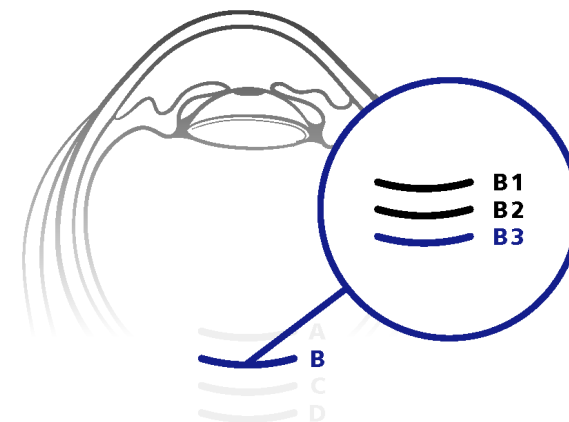
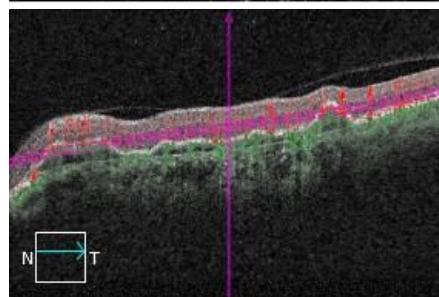
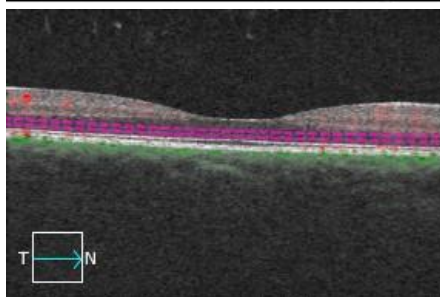
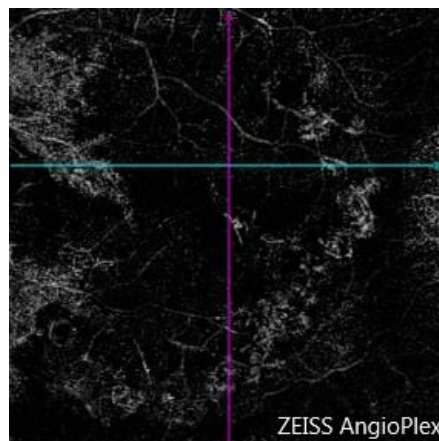
Avascular zone

In normal findings, no flow effects can be observed due to the missing vessels in OCT-A. Signal components in the area of the avascular zone may be an indication of pathologically altered retinal layers or vascular structures.

Normal



Choroidal neovascularization



Inner limit: Outer plexiform layer
Outer limit: Photoreceptors

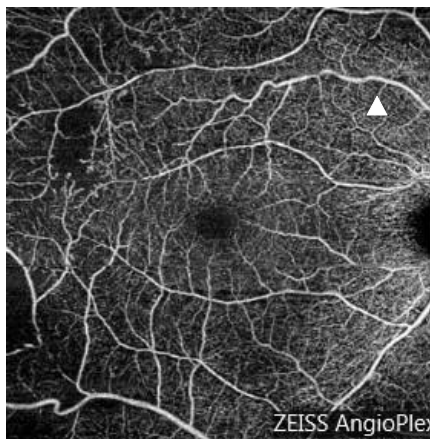
Substantial artifacts

Overview

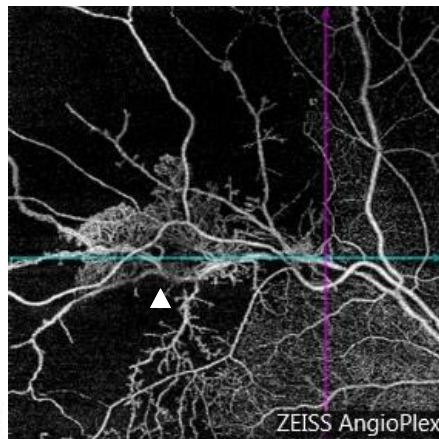


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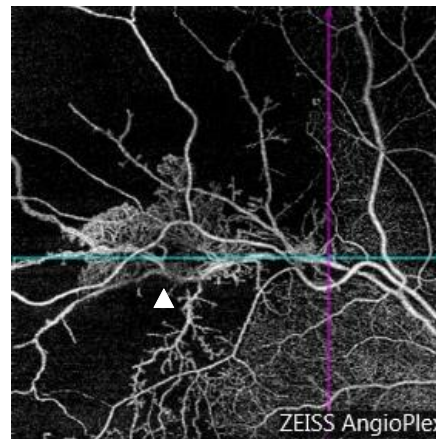
Projection effects 1



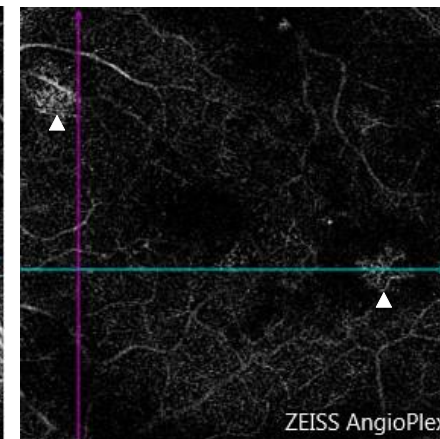
Projection effects 2



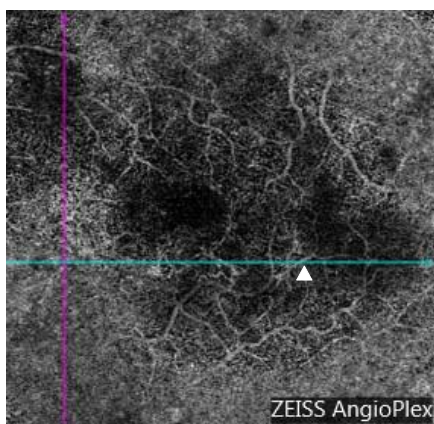
Projection effects 3



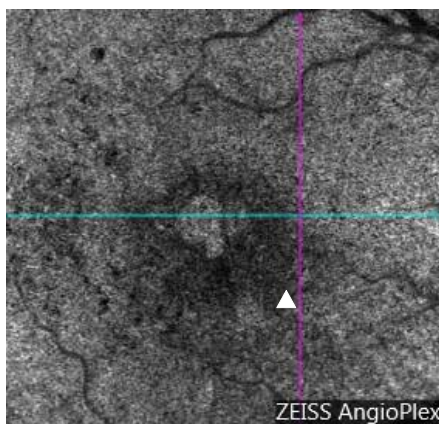
Projection effects 4



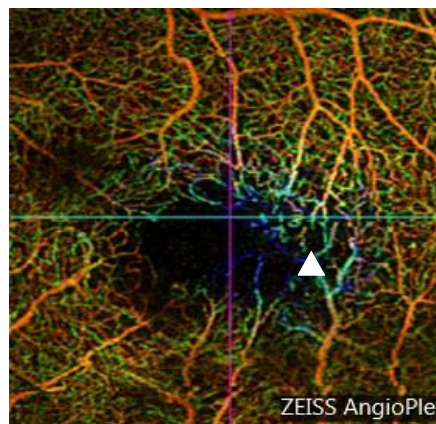
Shadowing and window effects 1



Shadowing and window effects 2



Shadowing and window effects 3

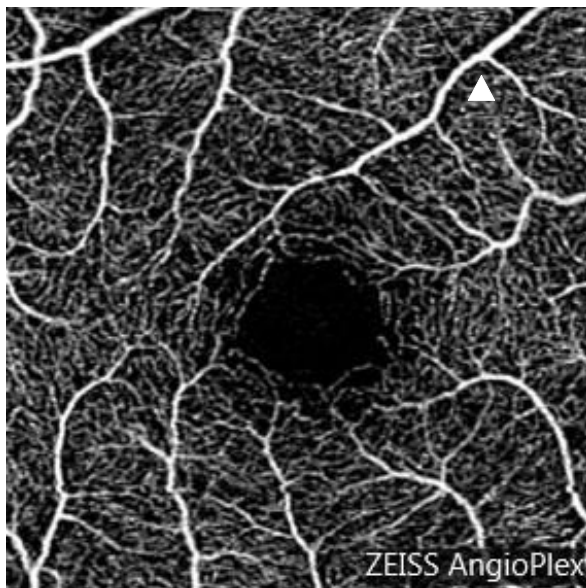


Substantial artifacts

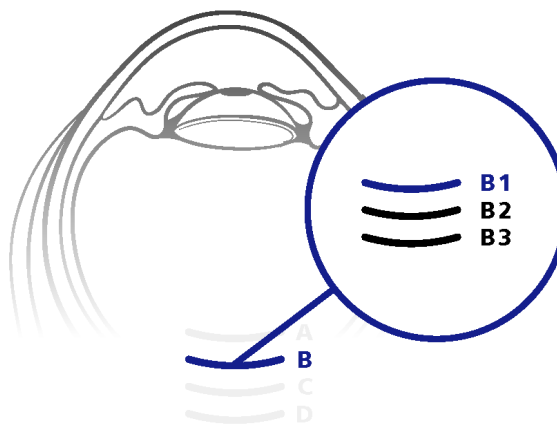
Projection effects

OCT-A displays signal changes in the reflection behavior in tissue. The blood flow in a superficial vessel also induces a signal change in a deeper vascular structure. This signal change is detected as blood flow and the superficial vascular structure appears – incorrectly – as a projection in the deeper tissue layers (see arrows).

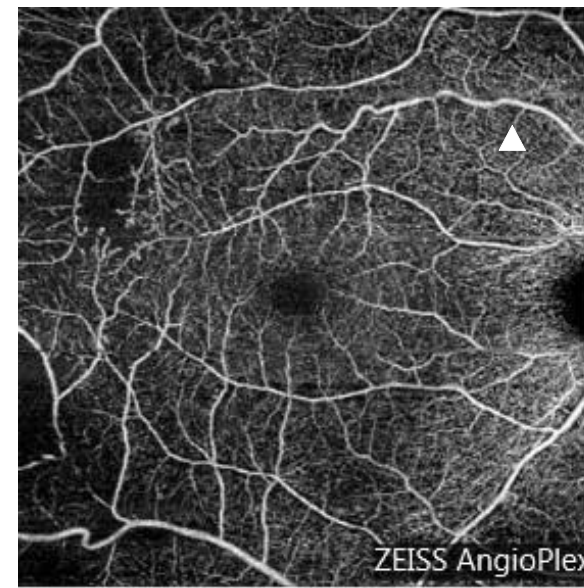
Normal



Superficial vascular plexus



Diabetic retinopathy



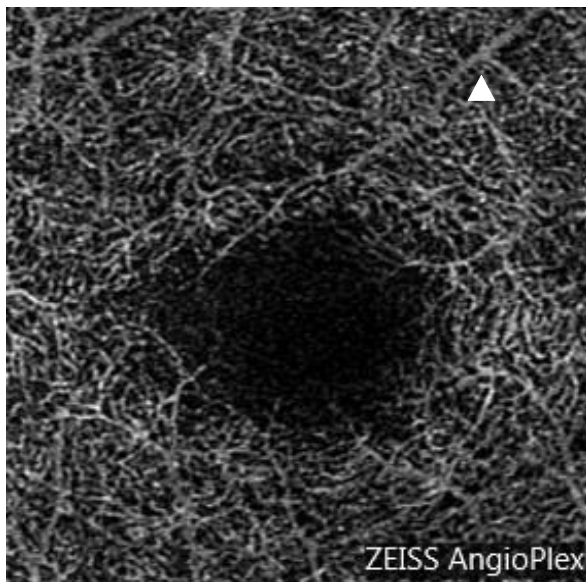
Substantial artifacts

Projection effects

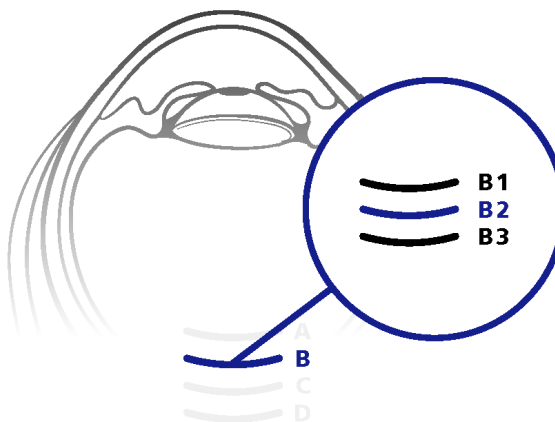


OCT-A displays signal changes in the reflection behavior in tissue. The blood flow in a superficial vessel also induces a signal change in a deeper vascular structure. This signal change is detected as blood flow and the superficial vascular structure appears – incorrectly – as a projection in the deeper tissue layers (see arrows).

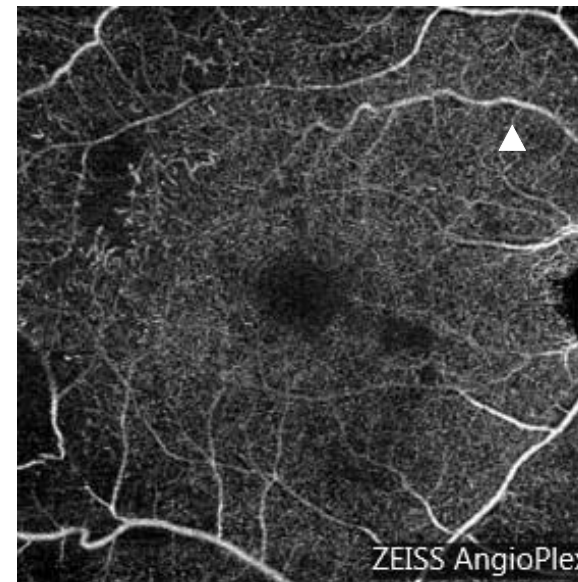
Normal



Deep vascular plexus



Diabetic retinopathy



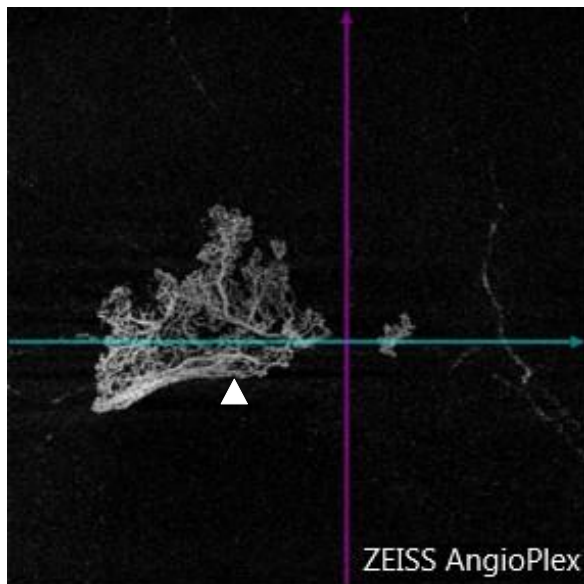
Substantial artifacts

Projection effects

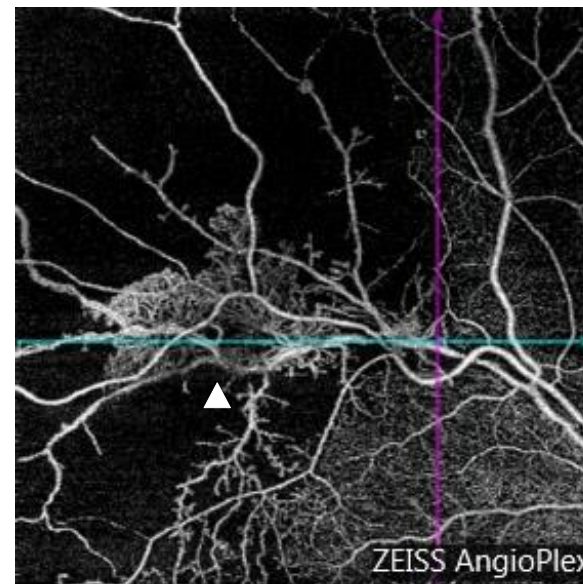
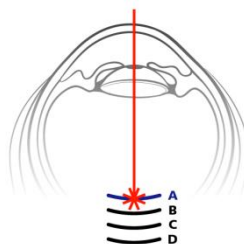


These projections are especially effective on the highly reflective layers in OCT such as the internal limiting membrane (Example below: retinal vascular occlusion).

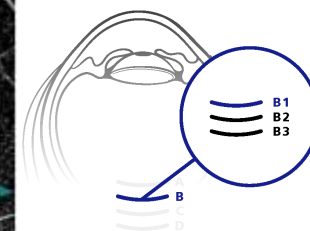
Retinal vascular occlusion



Vitreoretinal interface



Superficial vascular plexus



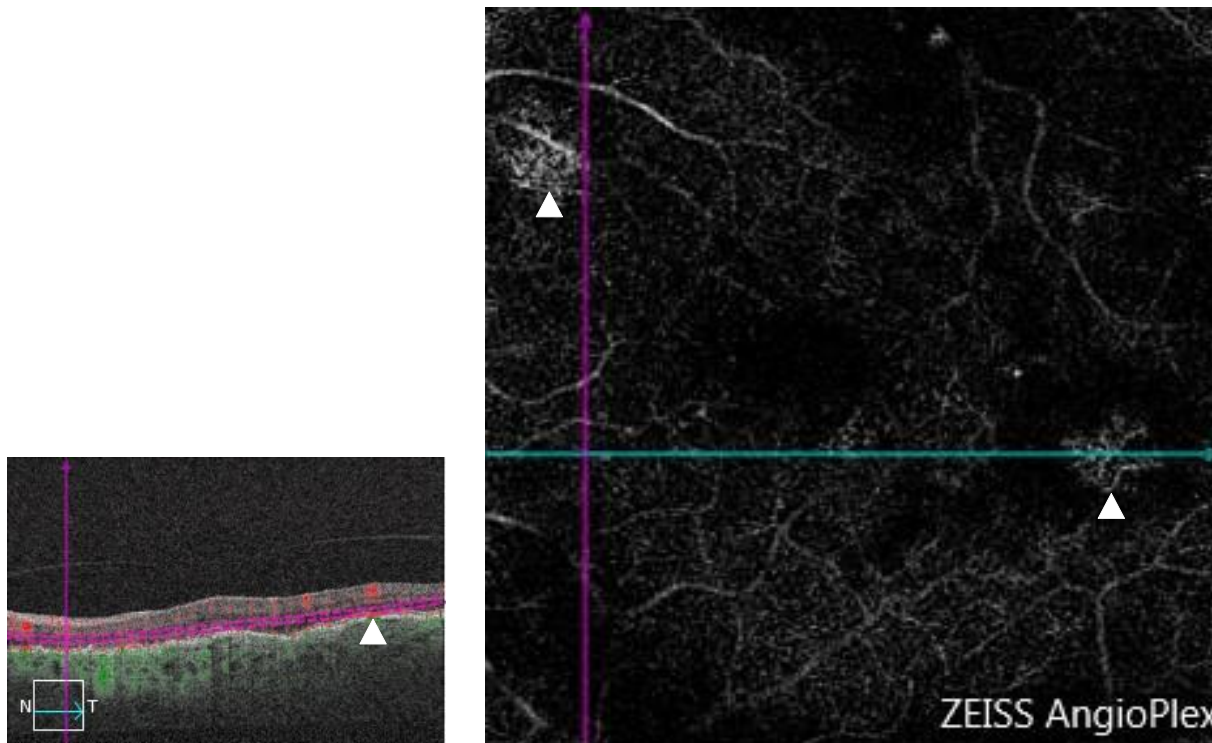
Substantial artifacts

Projection effects

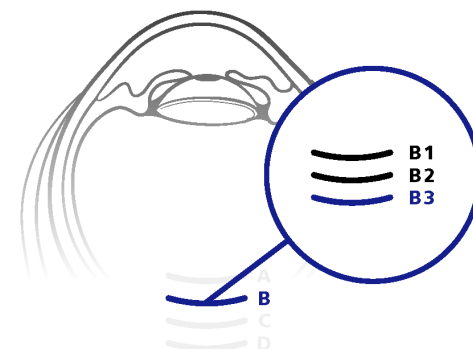


These projections are especially effective on the highly reflective layers in OCT such as the internal limiting membrane (Example below: retinal vascular occlusion) and the retinal pigment epithelium (Example below: pigment epithelial detachment).

Pigment epithelial detachment



Avascular zone



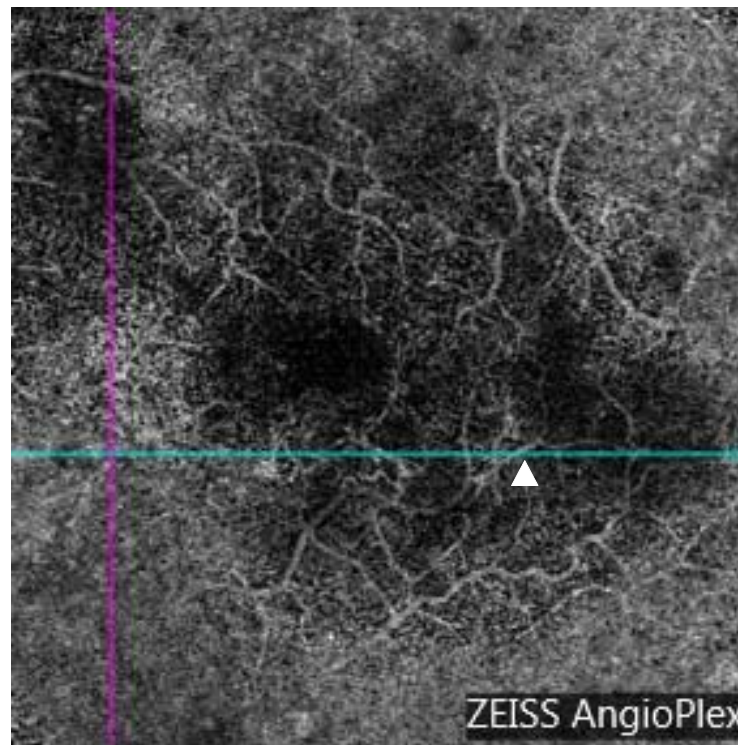
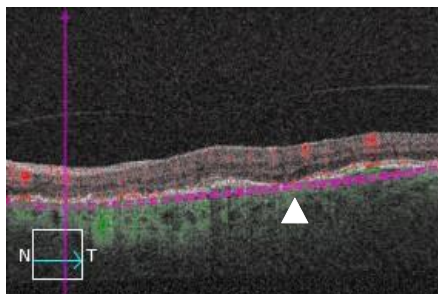
Substantial artifacts

Shadowing and window effects

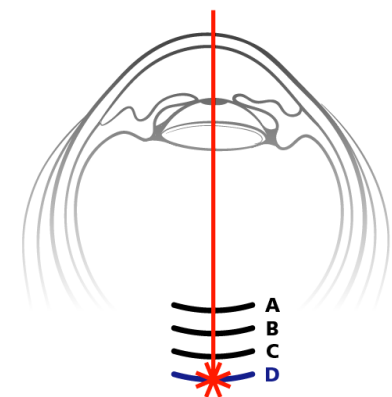


In OCT-A, temporal changes in the OCT signal are detected. The greater the absolute changes in the reflection signal are, the stronger the image contrast becomes at this location. The measured OCT-A signal thus also depends directly on the amount of light that falls on the structure to be examined.

Pigment epithelial detachment



Choroid



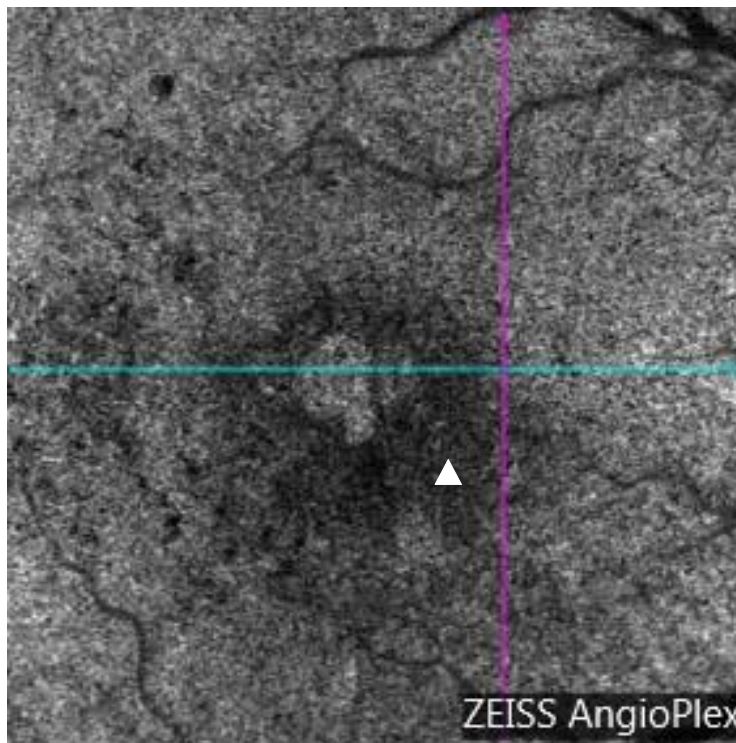
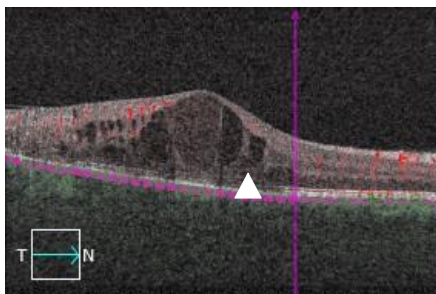
Substantial artifacts

Shadowing and window effects

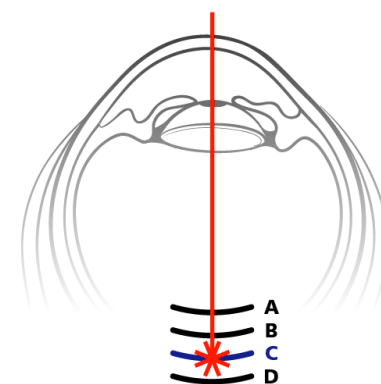


This can be observed especially when analyzing layers located below highly reflective layers (e.g. RPE, fibroses) or extremely thick layers (e.g. edemas). The visible changes in the OCT-A image display rather local shadowing effects here (see arrows).

Diabetic macular edema



Choriocapillaris



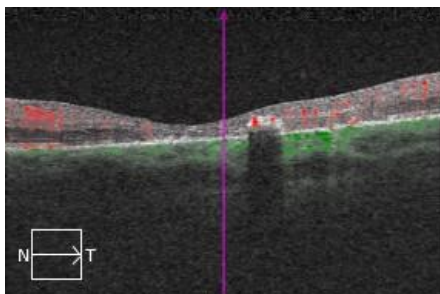
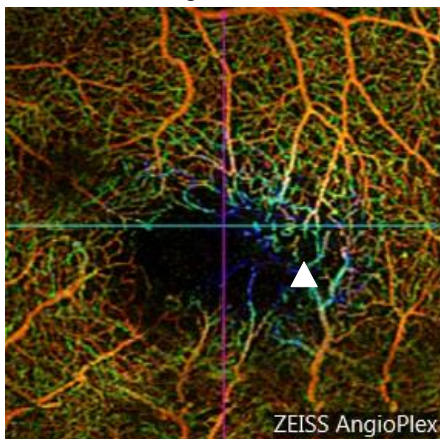
Substantial artifacts

Shadowing and window effects

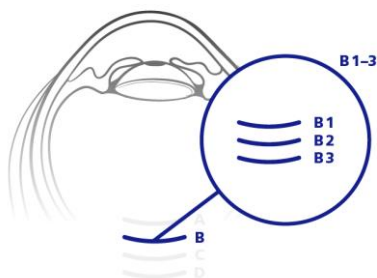


On the other hand, the loss of the overlying tissue layers leads to improved penetration of the OCT beam, and therefore to improved detectability of normal vascular perfusion in comparison to the surrounding tissue (see arrows).

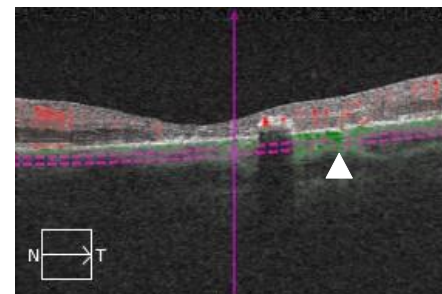
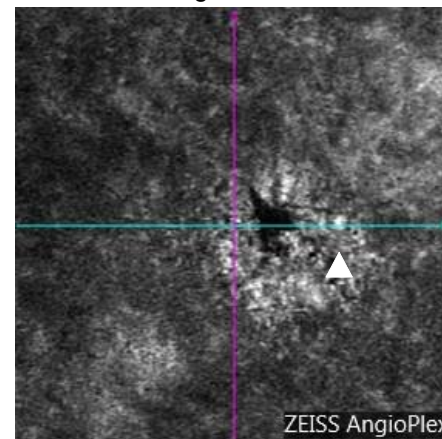
Macular telangiectasia



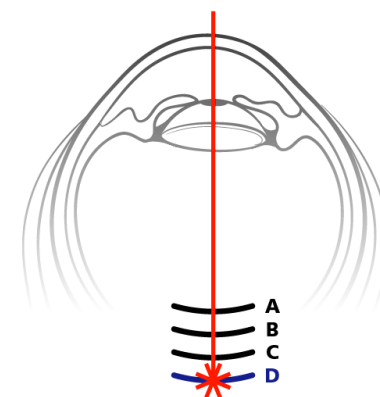
Retina (color-coded)



Macular telangiectasia



Choroid

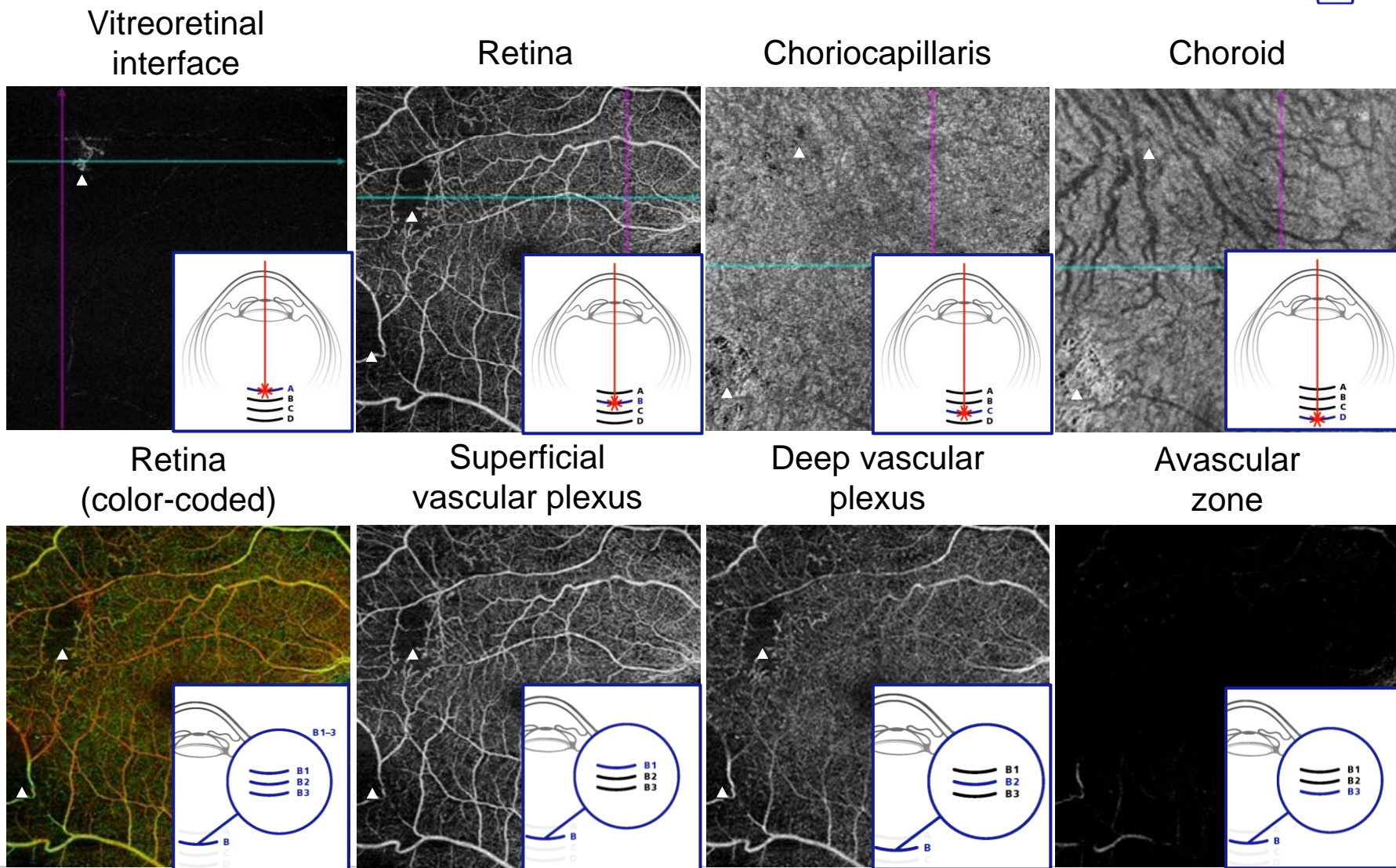


Case study 1: Diabetic retinopathy

Overview



Content



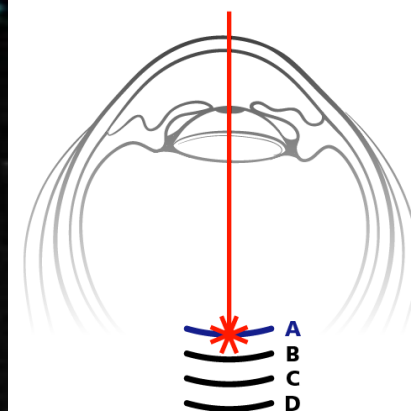
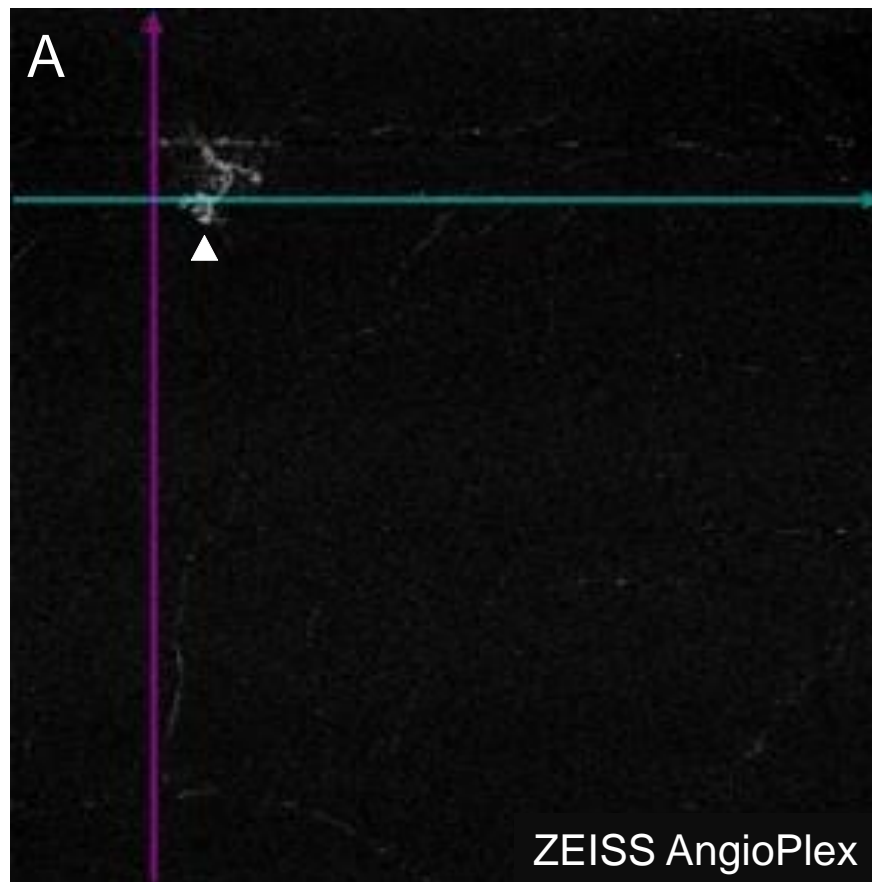
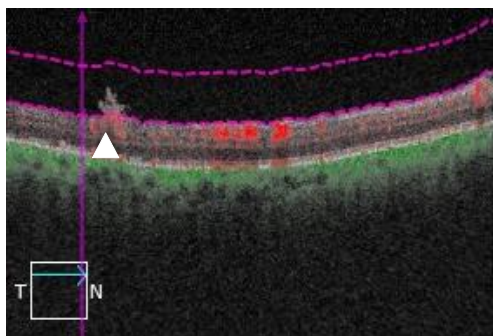
Case study 1: Diabetic retinopathy

OCT-A overview



Vitreoretinal interface

Along the interface of the vitreous body, proliferative vascular structures appear.



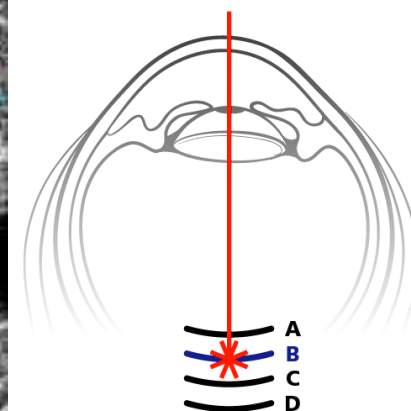
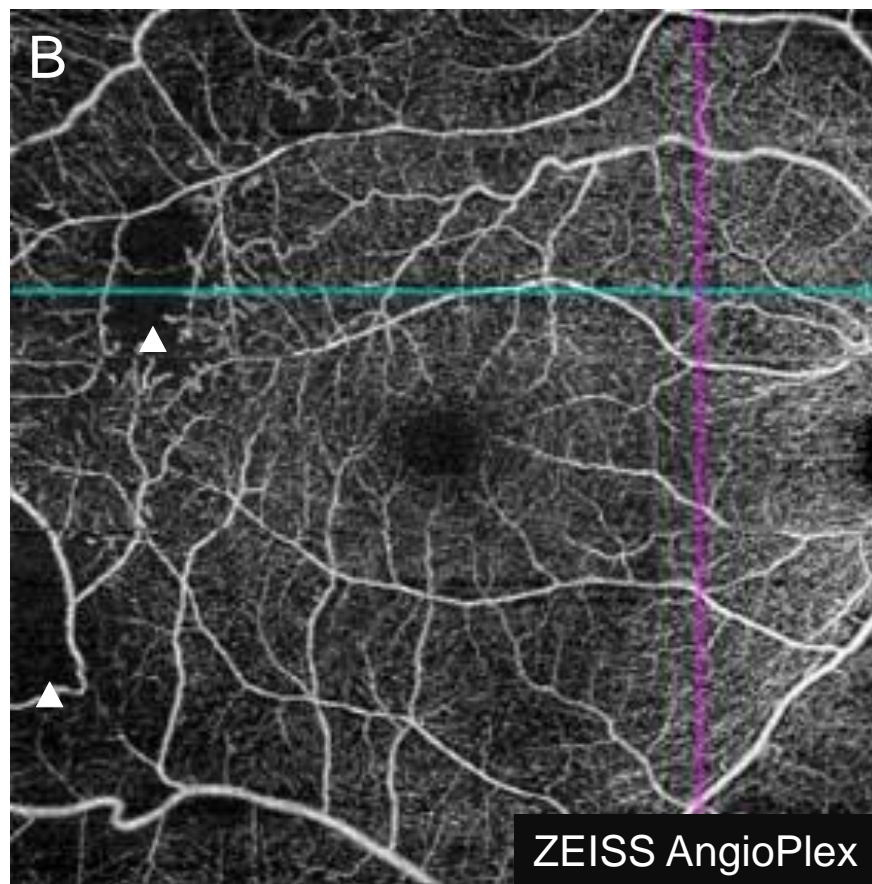
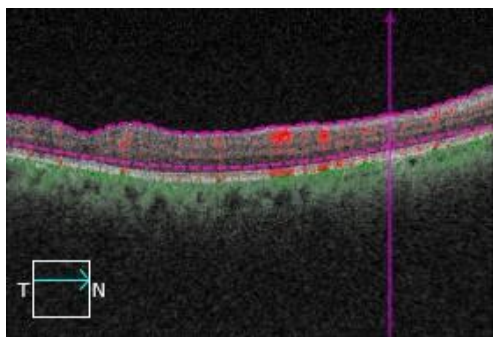
Case study 1: Diabetic retinopathy

OCT-A overview



Retina

The neurosensory retina displays an overall regular vascular pattern. Temporally, areas with a considerably reduced signal intensity can be detected (see arrows). These indicate perfusion disorders in this area.



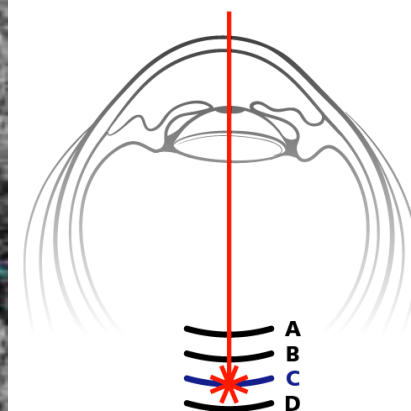
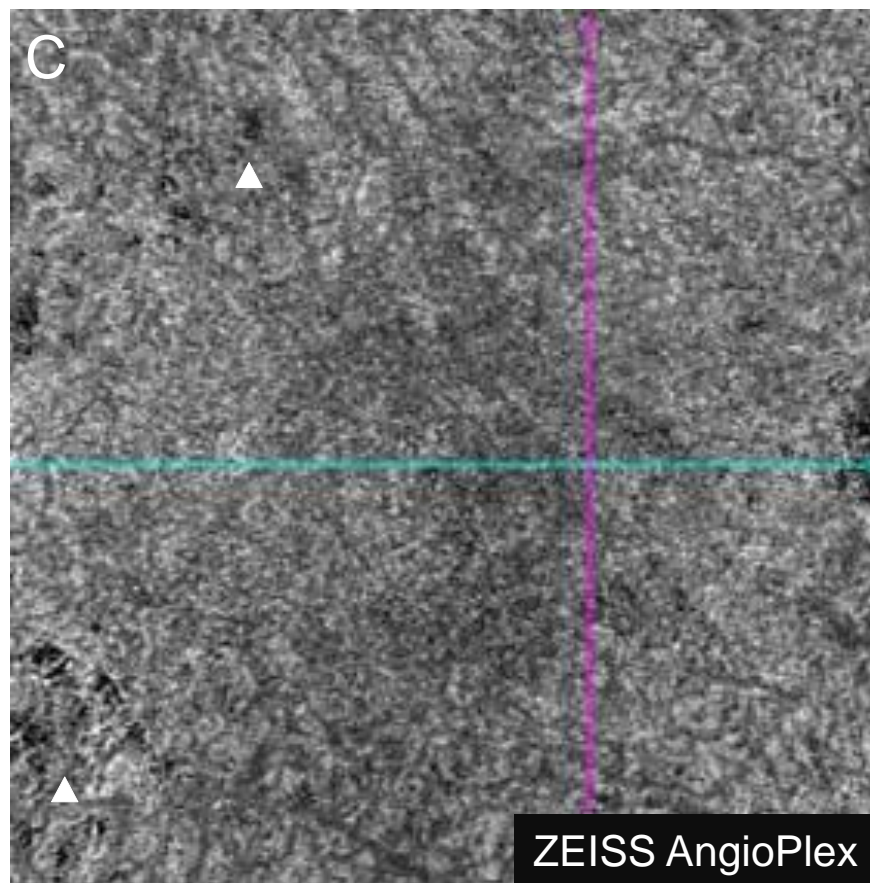
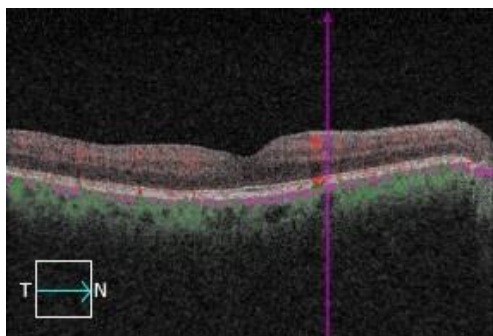
Case study 1: Diabetic retinopathy

OCT-A overview



Choriocapillaris

In the images of the choriocapillaris, the hypointense areas (see arrows) probably indicate existing laser effects.



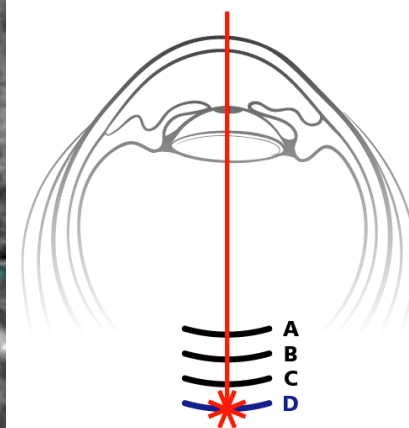
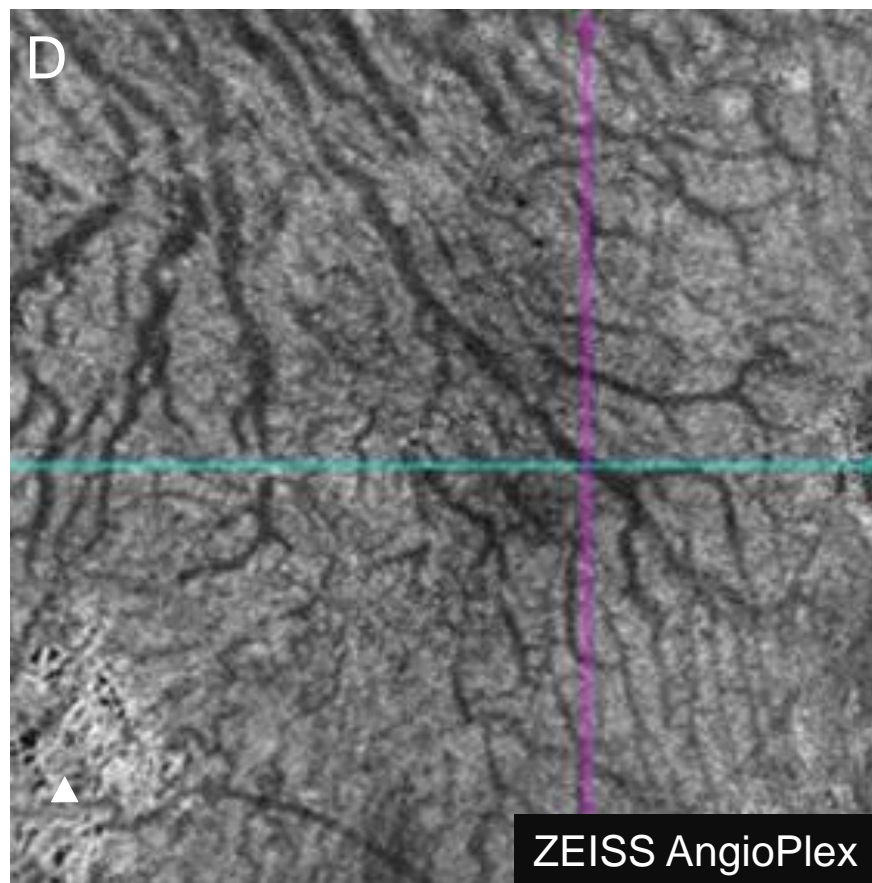
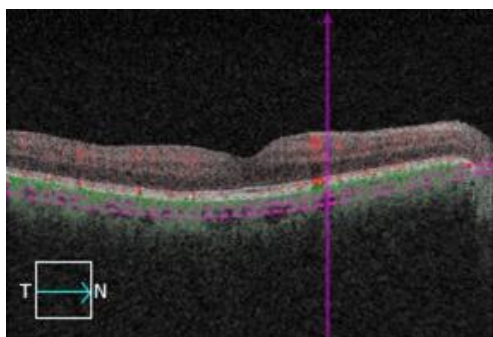
Case study 1: Diabetic retinopathy

OCT-A overview



Choroid

The images display existing laser effects (see arrows). The hypotense vascular structures are probably based on shadowing effects and should not be confused with perfusion disorders.



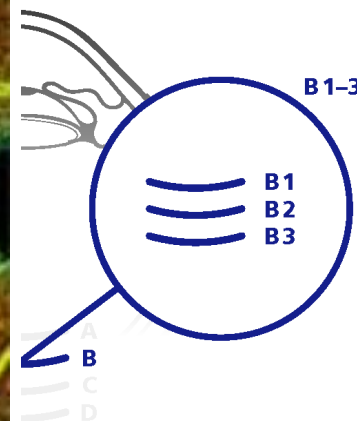
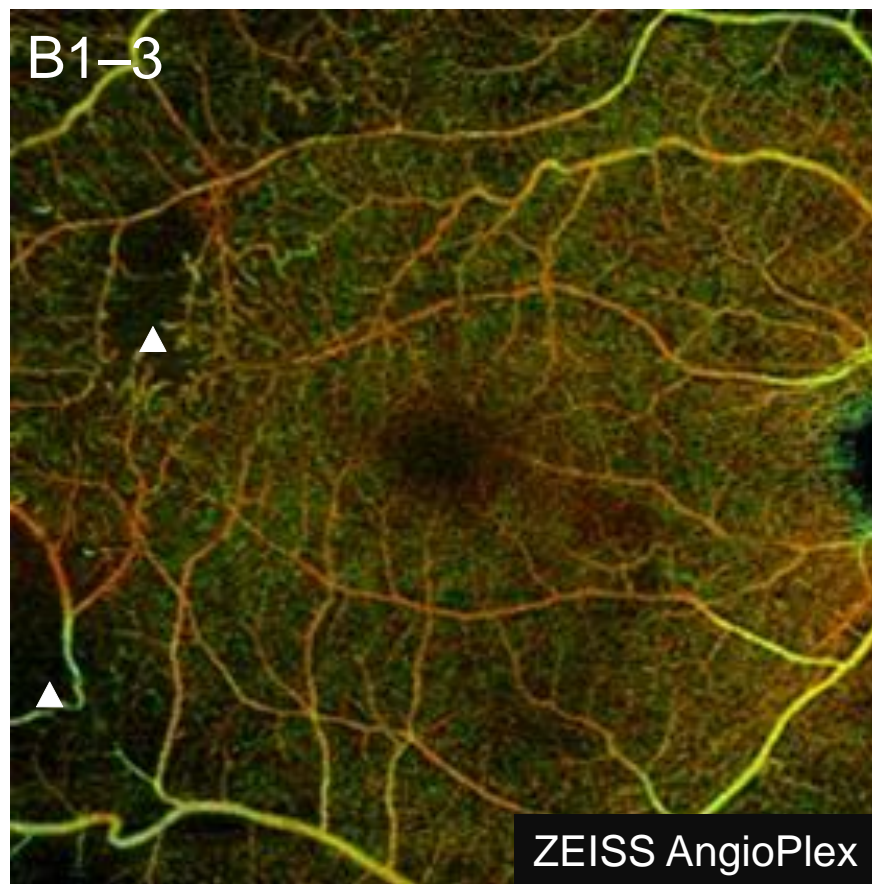
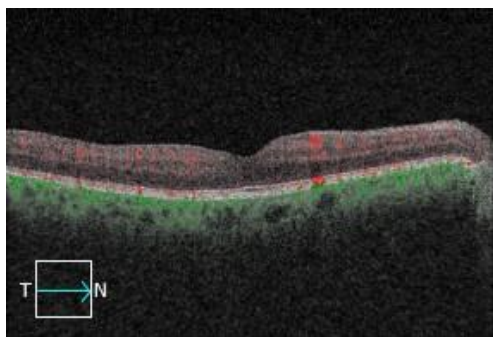
Case study 1: Diabetic retinopathy

OCT-A detailed analysis



Retina (color-coded)

The color coded representation of the retinal layers shows a loss of the red and green coded information in the abnormal areas (see arrows).



Case study 1: Diabetic retinopathy

OCT-A detailed analysis



Overview

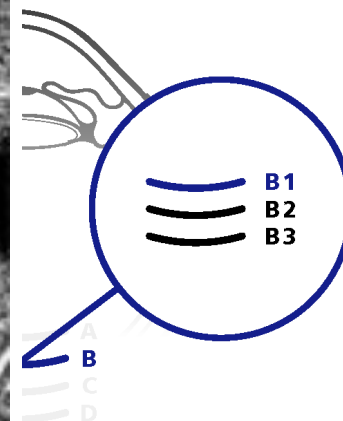
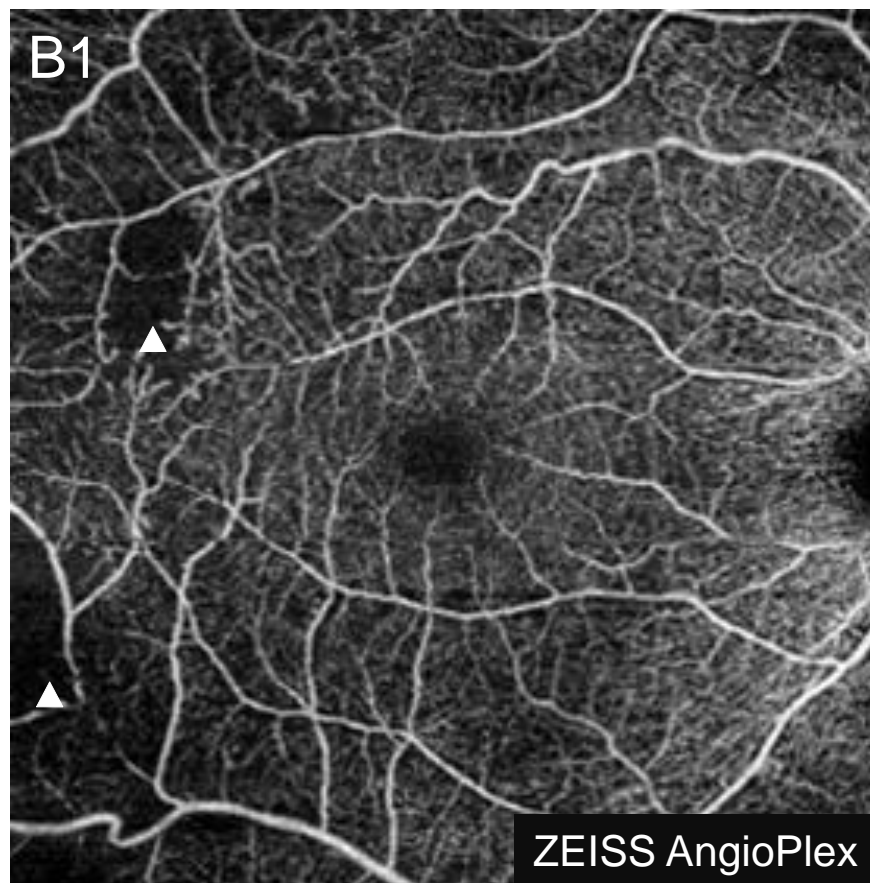
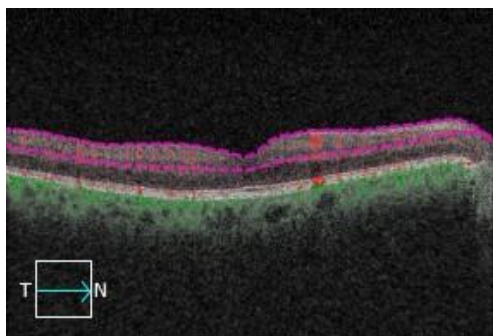


Content



Superficial vascular plexus

In the detailed analysis of the retina it becomes apparent that the restricted hypointense area pervades both the superficial and the deep vascular plexus.



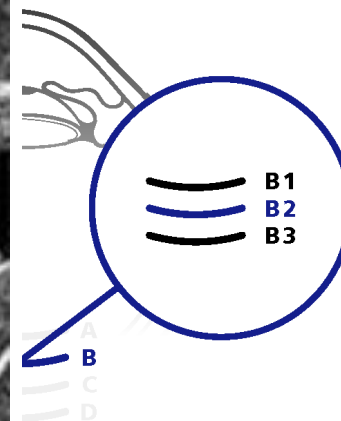
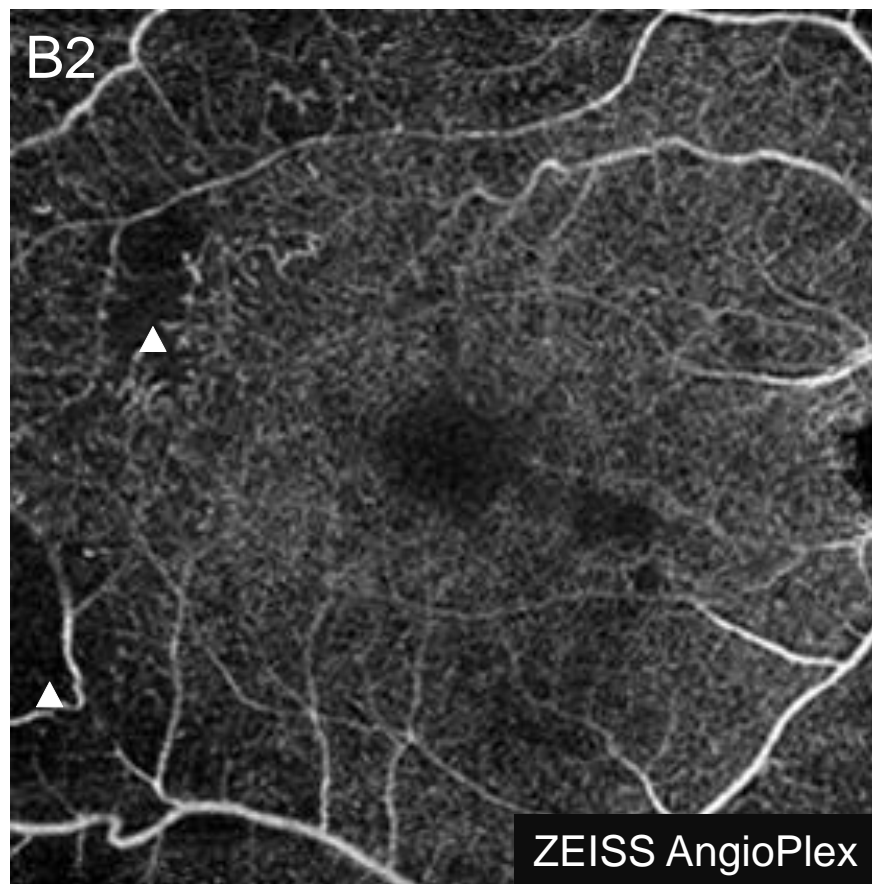
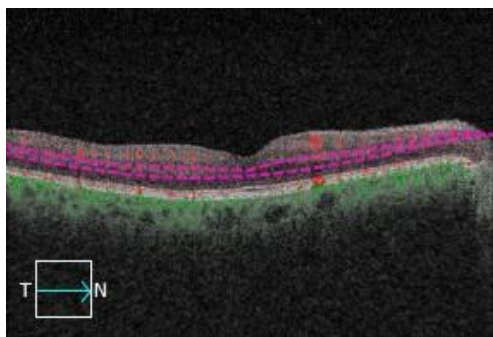
Case study 1: Diabetic retinopathy

OCT-A detailed analysis



Deep vascular plexus

In the detailed analysis of the retina it becomes apparent that the restricted hypointense area pervades both the superficial and the deep vascular plexus.



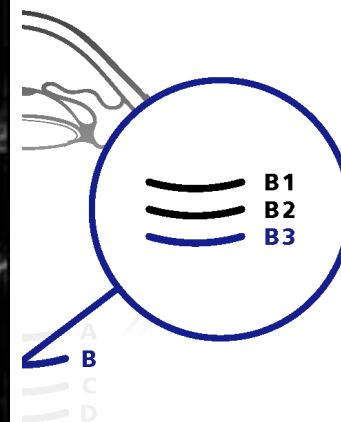
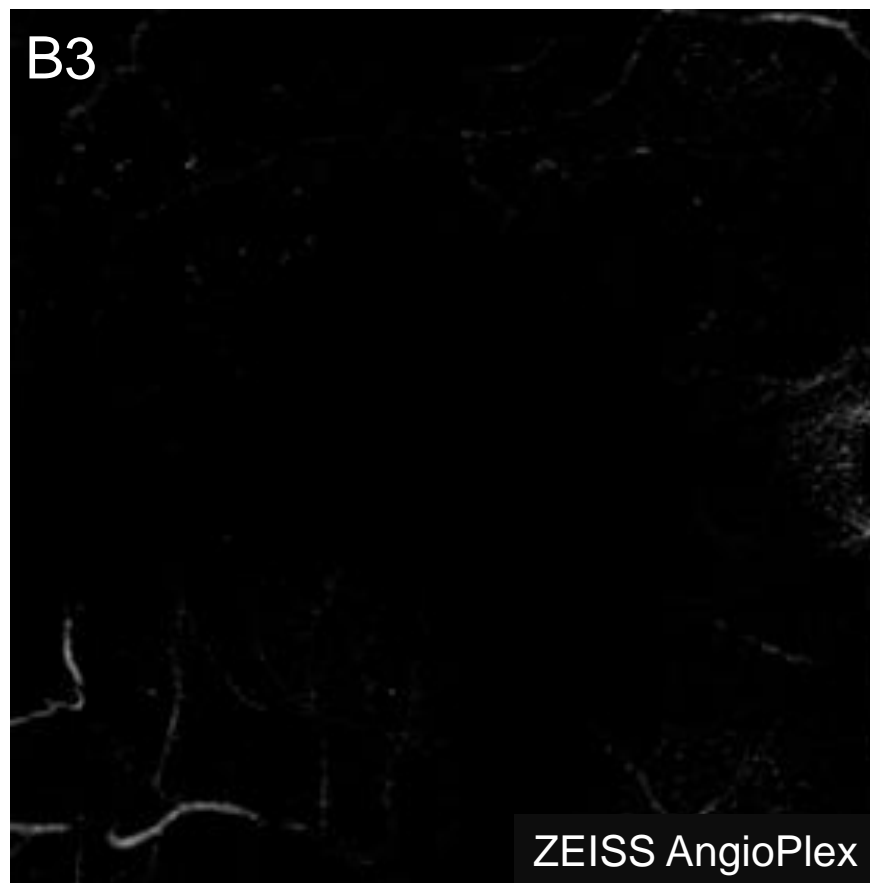
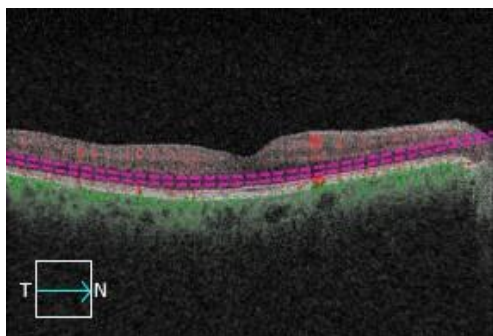
Case study 1: Diabetic retinopathy

OCT-A detailed analysis



Avascular zone

The OCT-A representation from the avascular zone shows no abnormalities. Only several projection artifacts can be detected, which clearly must be assigned to the overlying vascular layers.



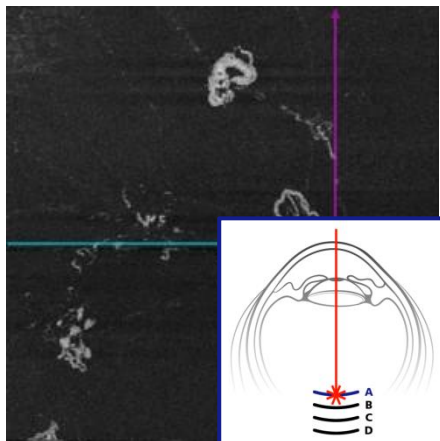
Case study 2: Diabetic retinopathy

Overview

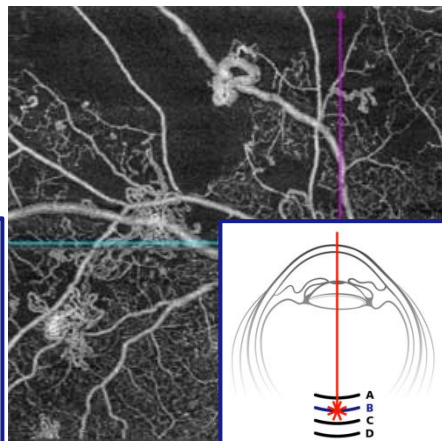


Content

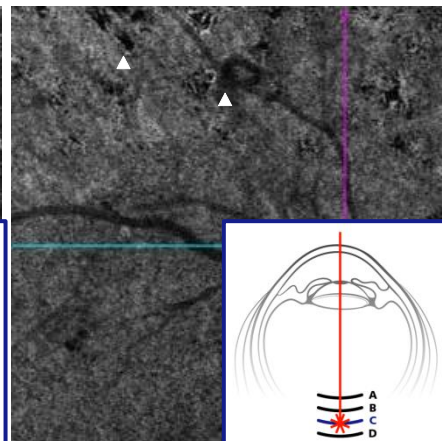
Vitreoretinal interface



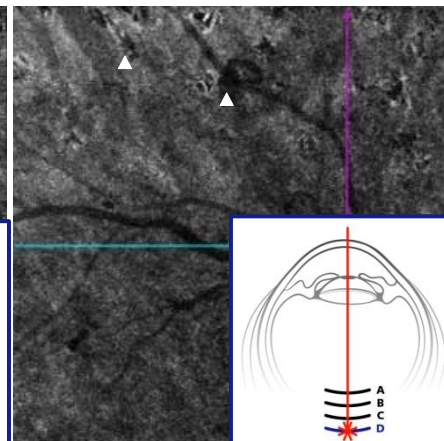
Retina



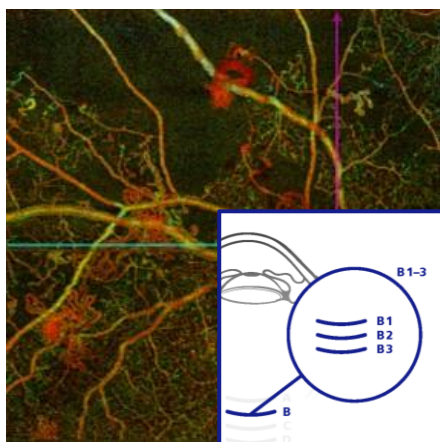
Choriocapillaris



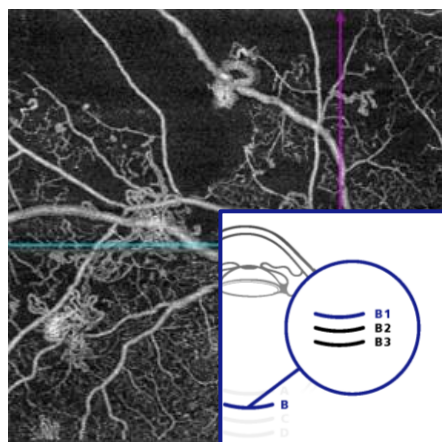
Choroid



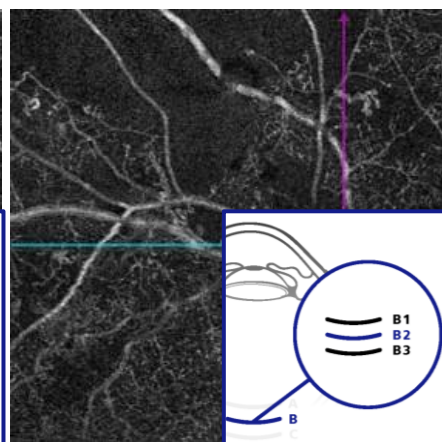
Retina
(color coded)



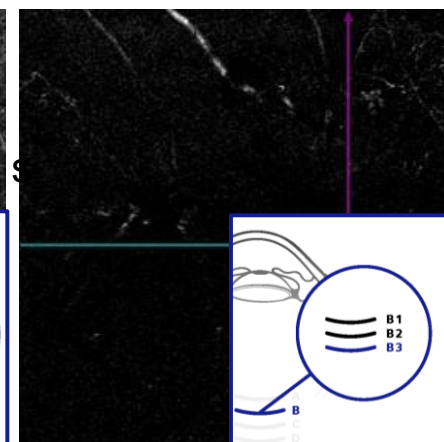
Superficial
vascular plexus



Deep
vascular plexus



Avascular
zone



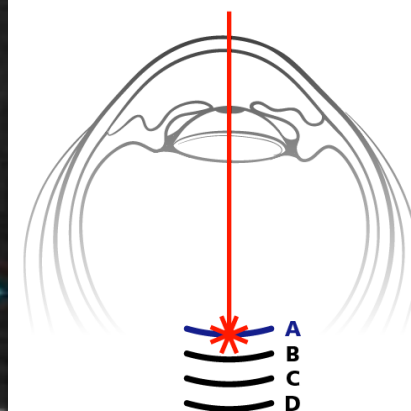
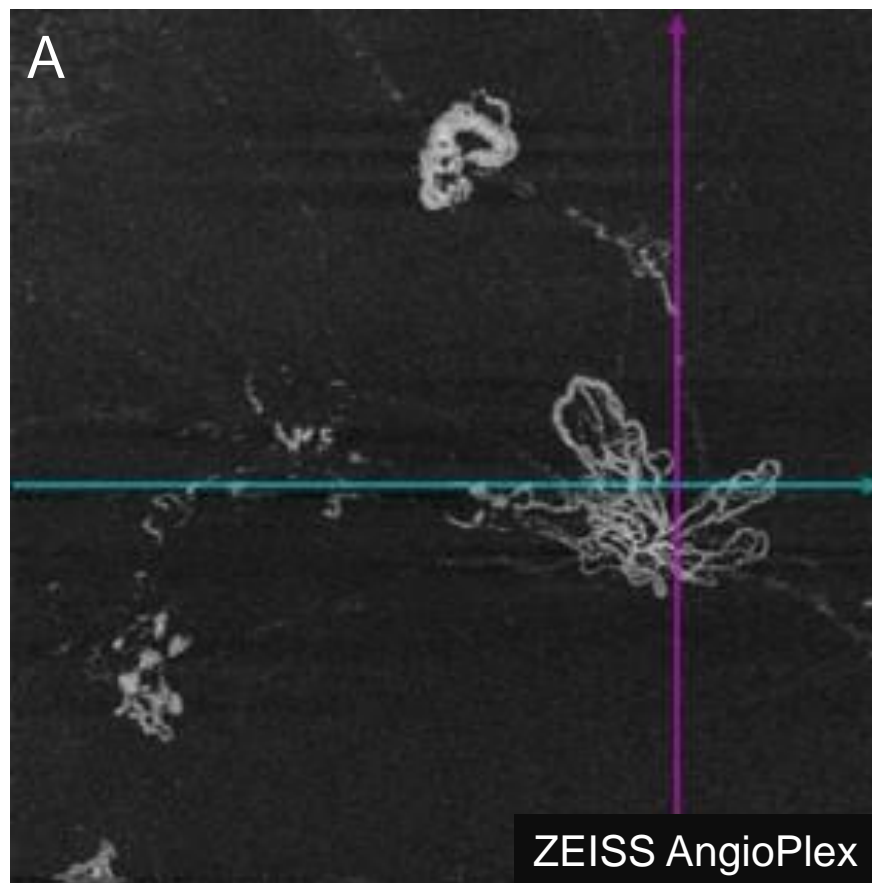
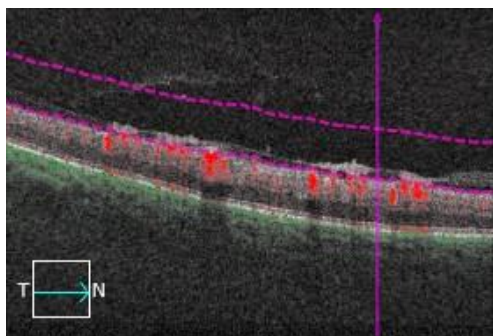
Case study 2: Diabetic retinopathy

OCT-A overview



Vitreoretinal interface

The OCT-A representation of the vitreous body interface shows different vascular patterns which imply vascular proliferations.



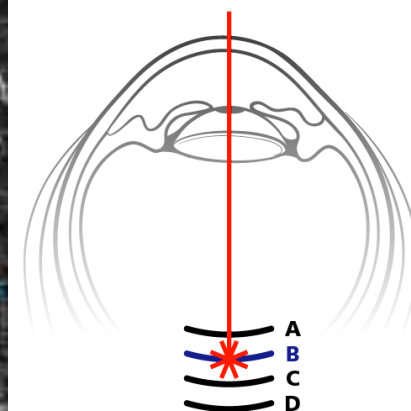
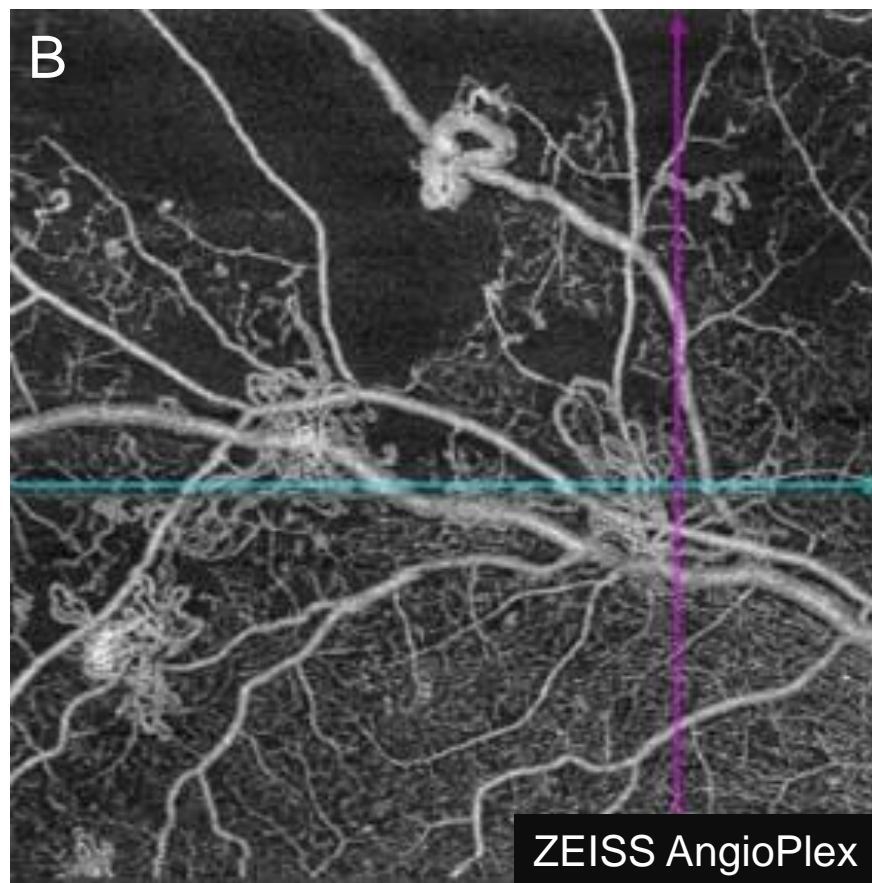
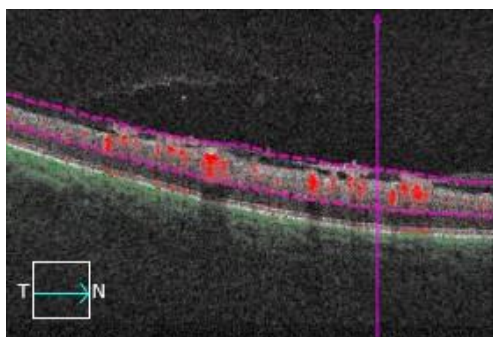
Case study 2: Diabetic retinopathy

OCT-A overview



Retina

Several areas show a severely diminished flow signal as well as proliferative vascular networks and micro-aneurysms. Signal components partially originate from projection effects of the superficial vascular networks on the vitreous body interface.



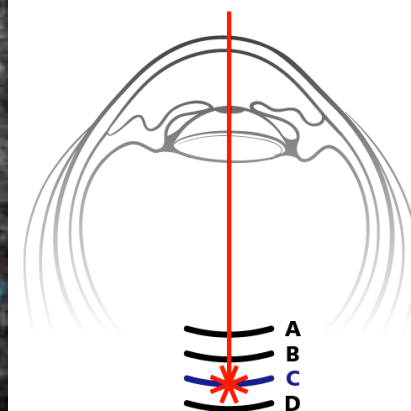
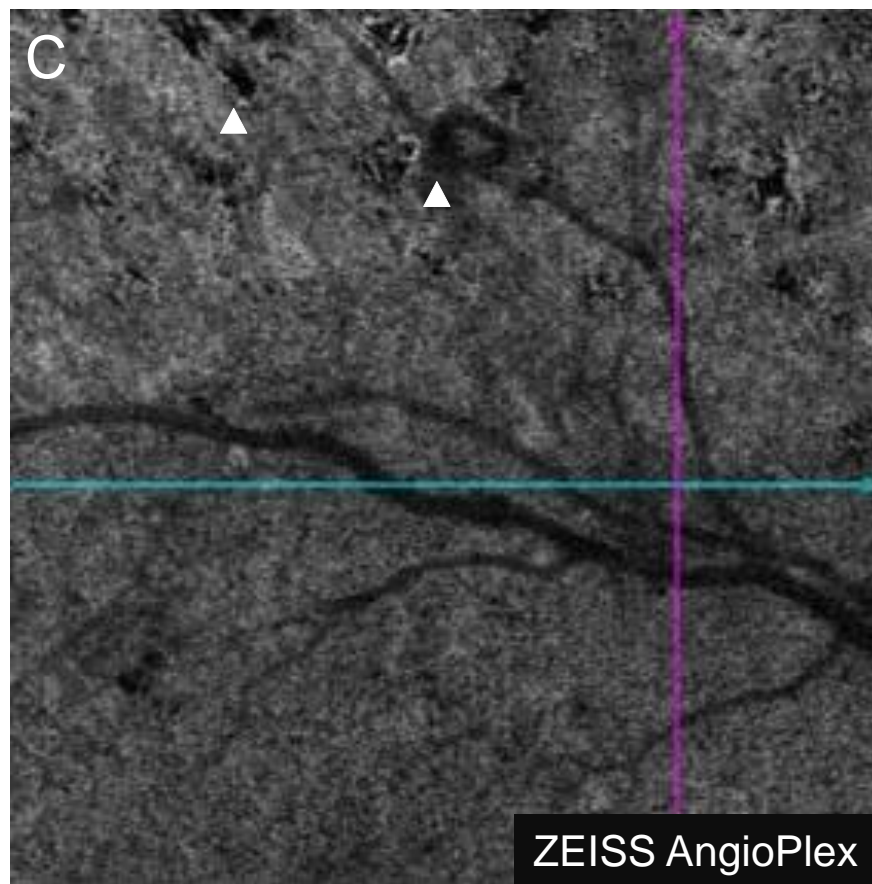
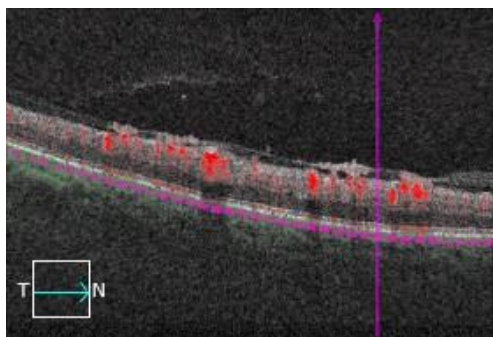
Case study 2: Diabetic retinopathy

OCT-A overview



Choriocapillaris

In the area of the choriocapillaris and the choroid, existing laser effects appear (see arrows).



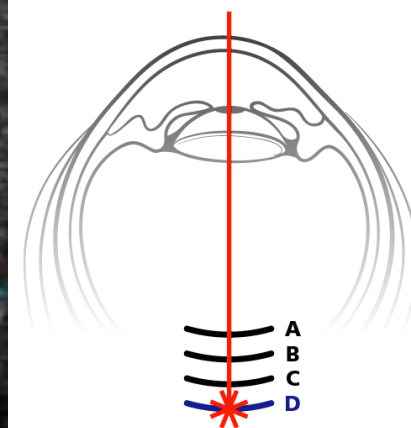
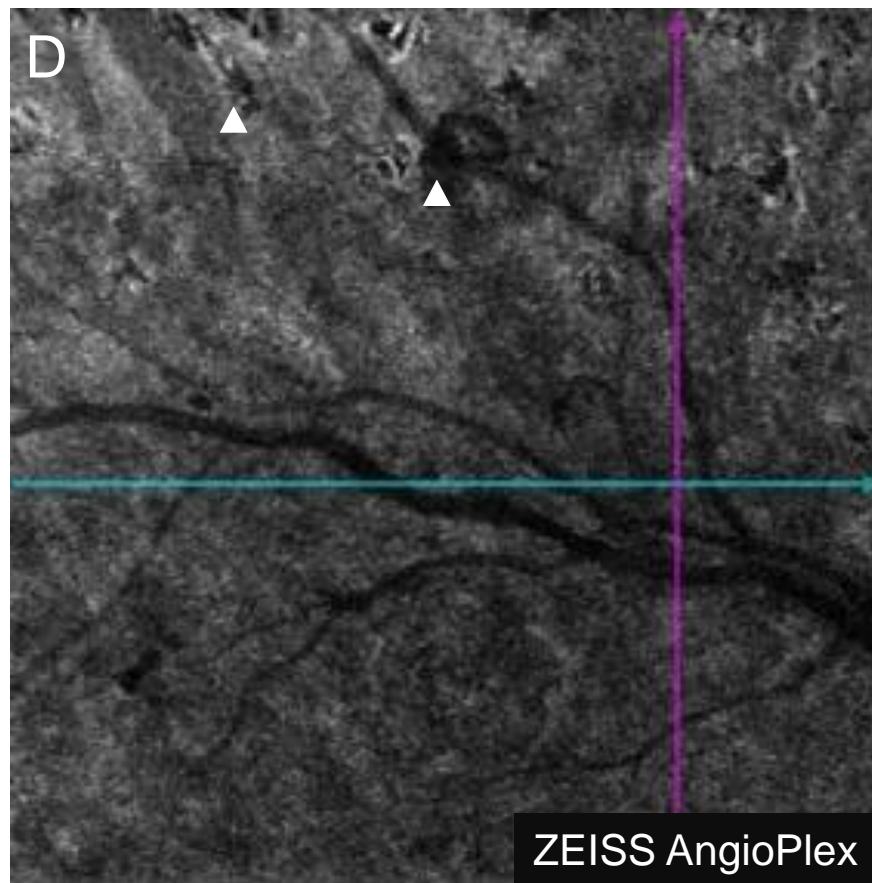
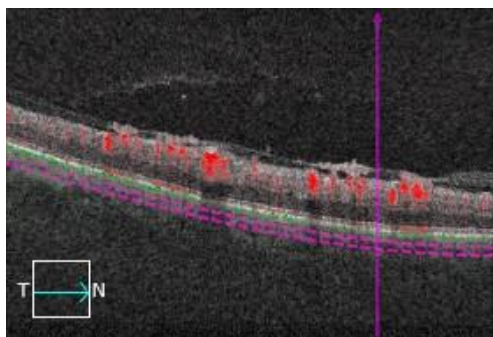
Case study 2: Diabetic retinopathy

OCT-A overview



Choroid

In the area of the choriocapillaris and the choroid, existing laser effects appear (see arrows).



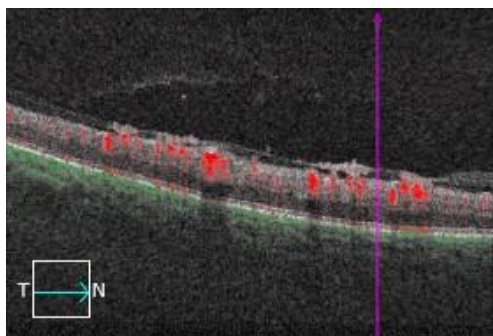
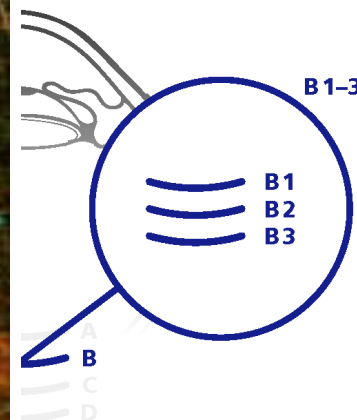
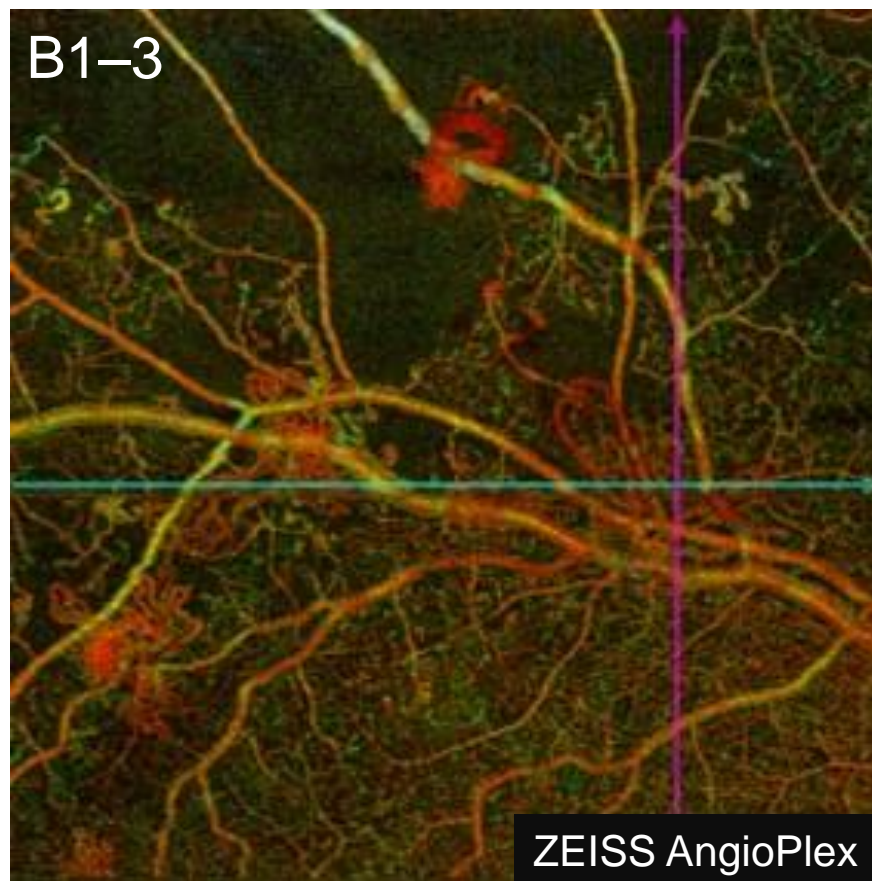
Case study 2: Diabetic retinopathy

OCT-A detailed analysis



Retina (color coded)

The areas of reduced signal intensity appear both in the superficial and in the deep vascular plexus.



Case study 2: Diabetic retinopathy

OCT-A detailed analysis



Overview

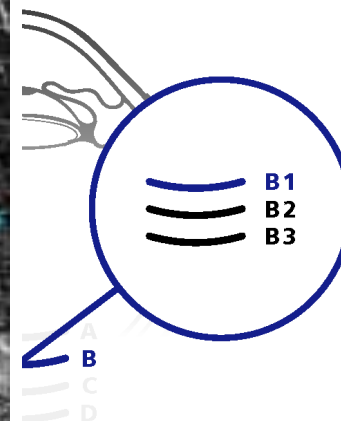
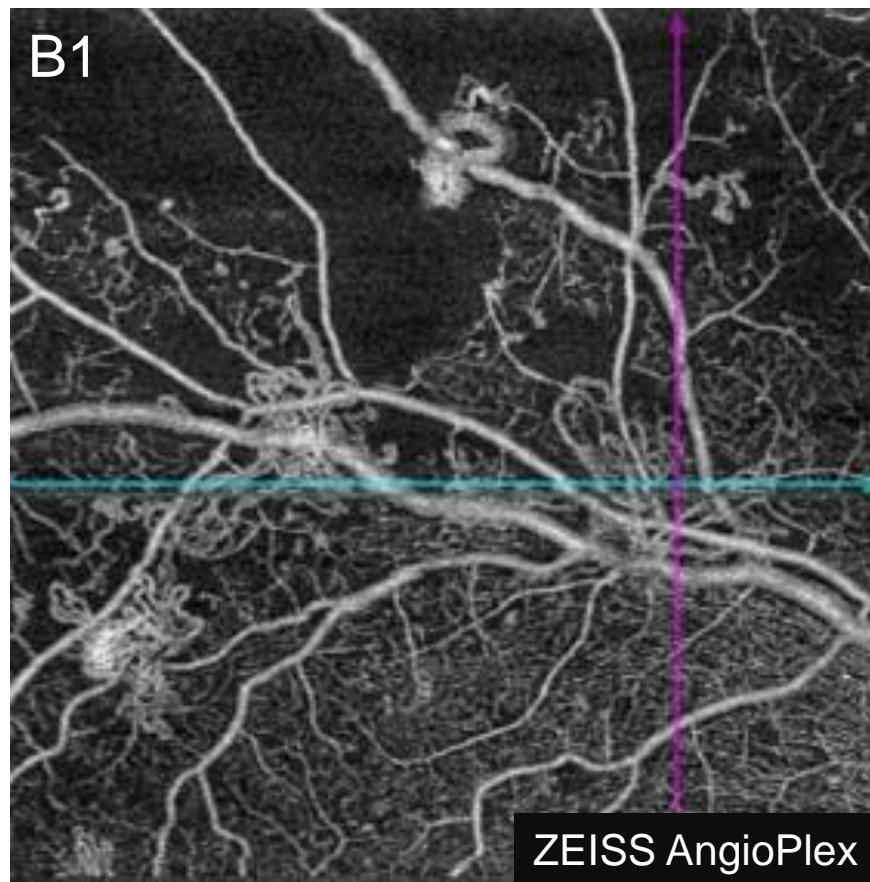
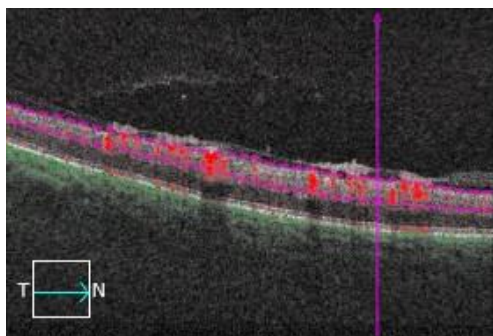


Content



Superficial vascular plexus

In some areas, it can be assumed that the deep vascular plexus is more strongly affected. The vascular proliferations are, however, more likely attributable to the superficial vascular plexus, seen here.



Case study 2: Diabetic retinopathy

OCT-A detailed analysis



Overview

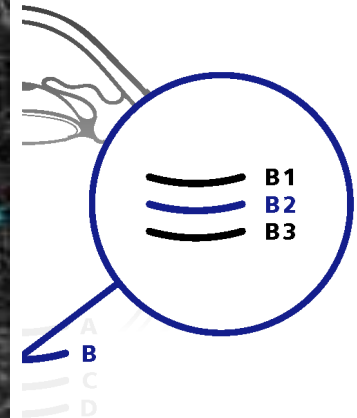
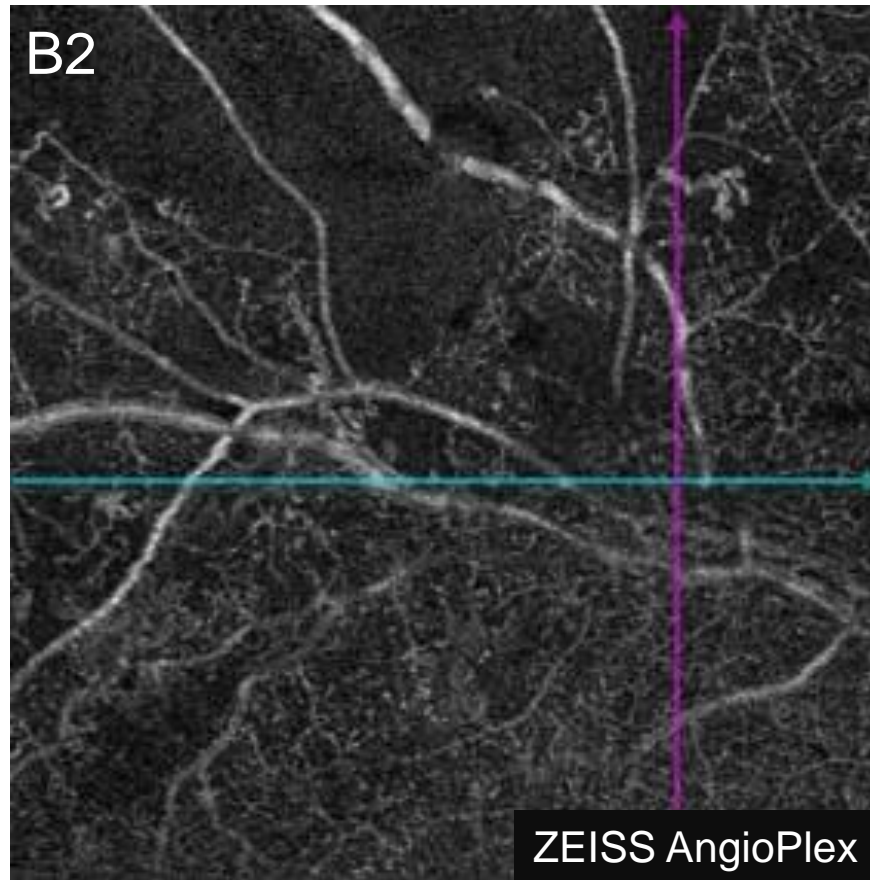
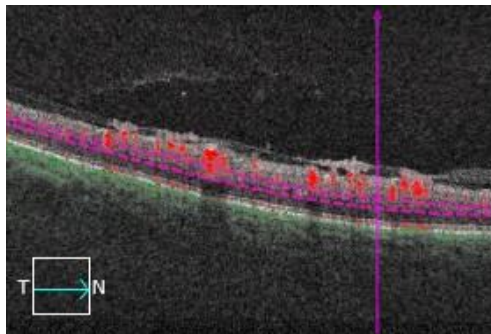


Content



Deep vascular plexus

As opposed to the deep vascular plexus see here.



Case study 2: Diabetic retinopathy

OCT-A detailed analysis



Overview



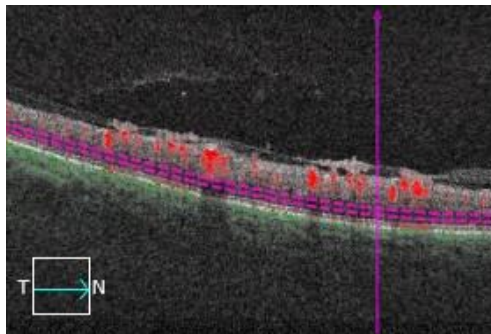
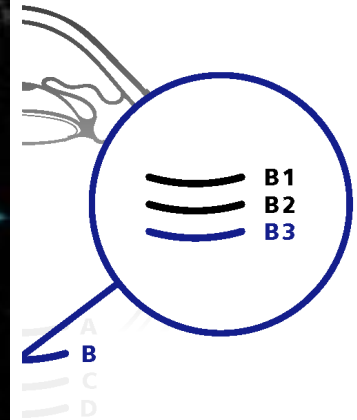
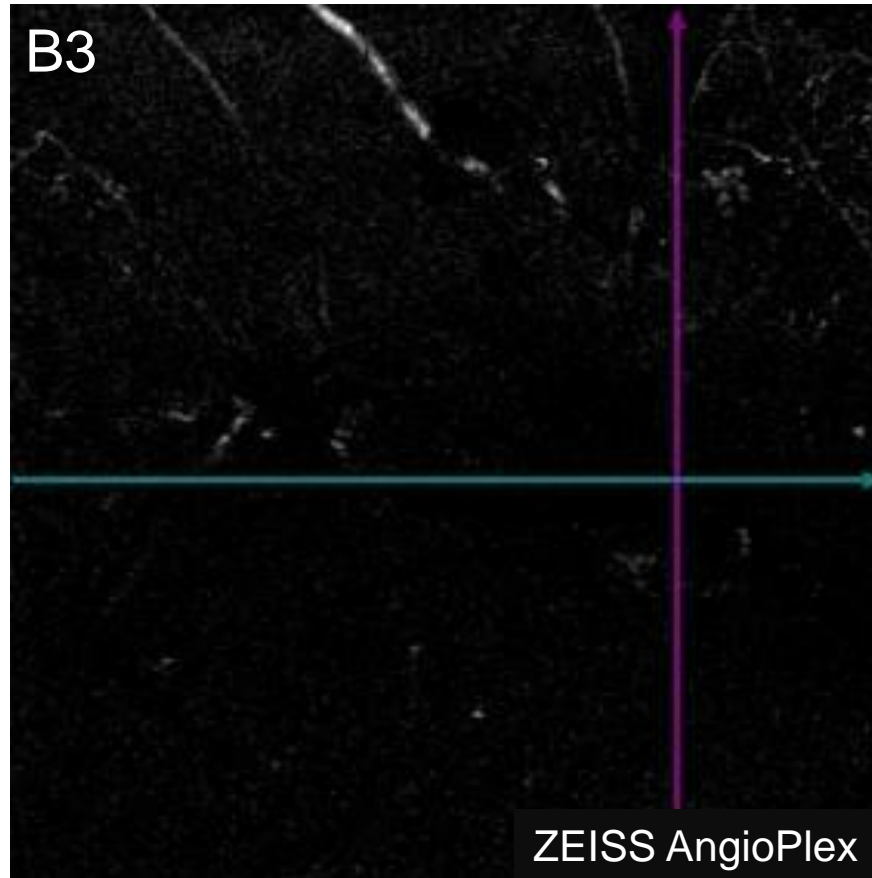
Content



Avascular zone

No abnormalities appear in the avascular area. The signal components come from the overlying vascular structures.

B3



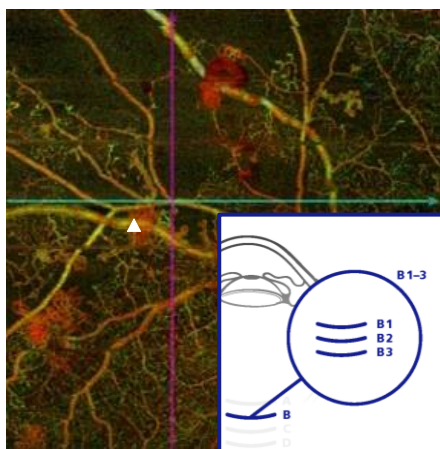
Case study 2: Diabetic retinopathy

Overview of follow-up examination

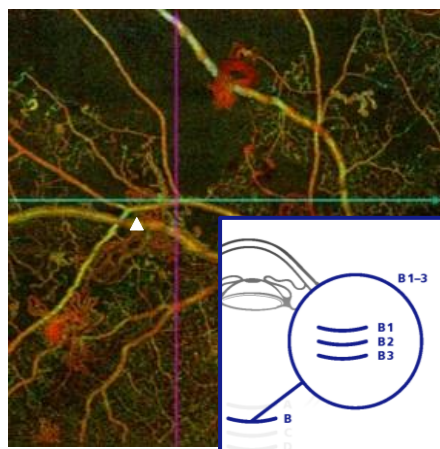


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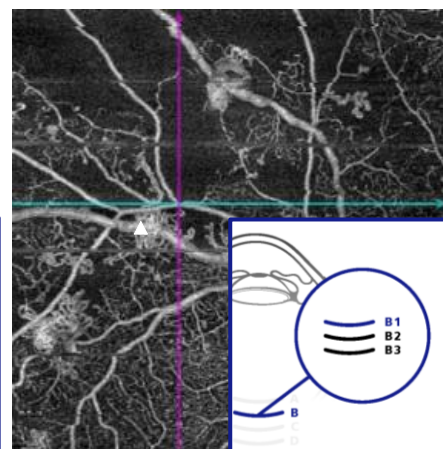
Initial examination
Retina



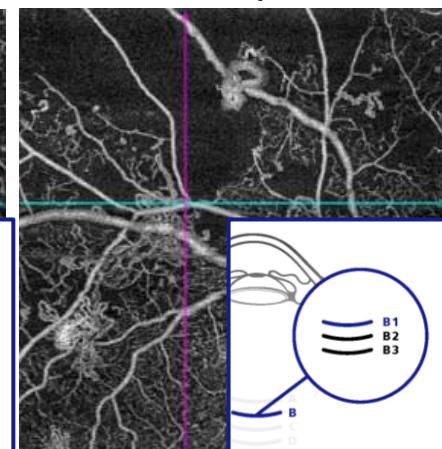
Follow-up
examination Retina



Follow-up examination
Vascular plexus



Follow-up examination
Vascular plexus



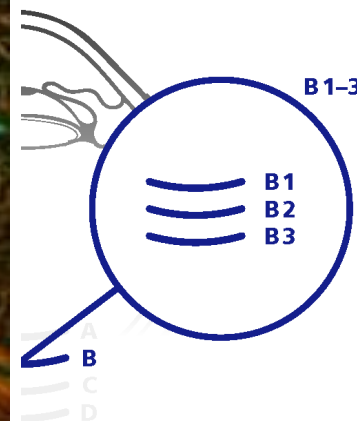
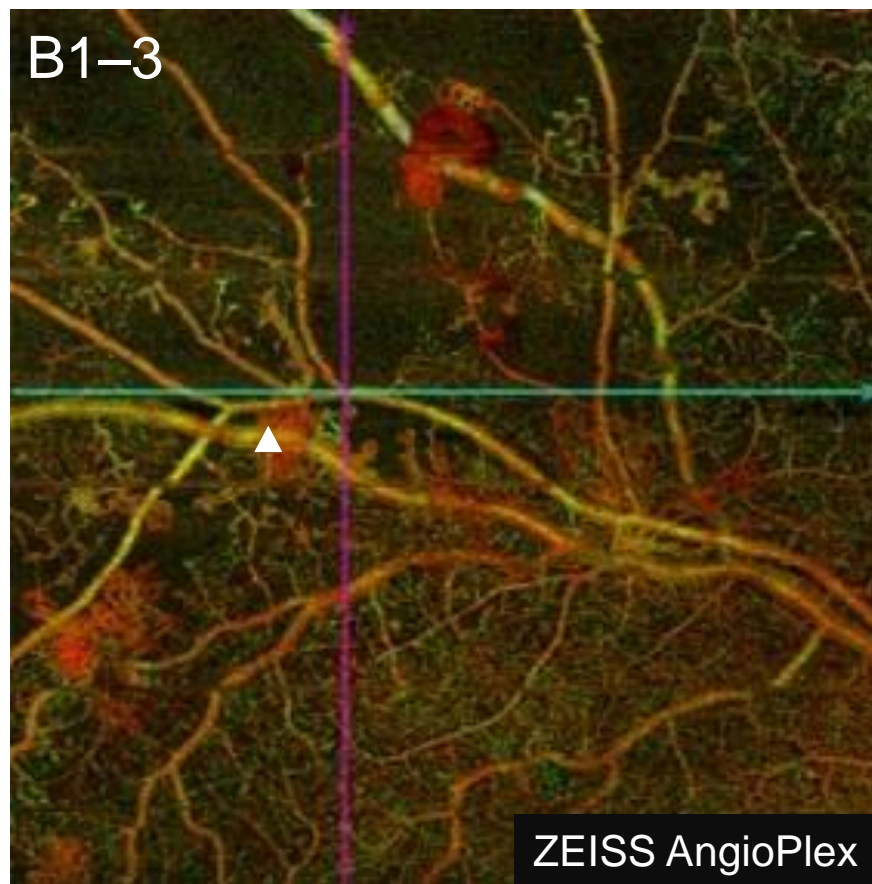
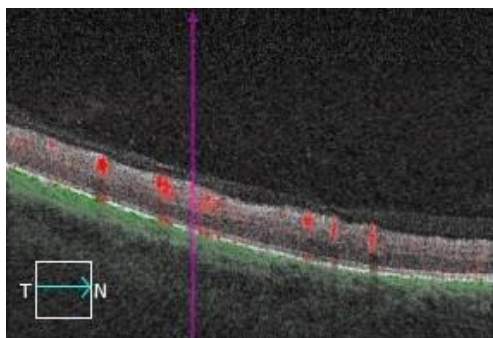
Case study 2: Diabetic retinopathy

OCT-A follow-up



Retina (color coded)

The areas of reduced signal intensity and the altered vascular structures are easy to evaluate in the course of time. This example shows a locally more pronounced vascular network in the follow-up examination.



Initial examination

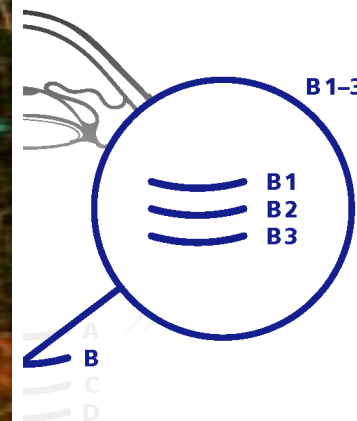
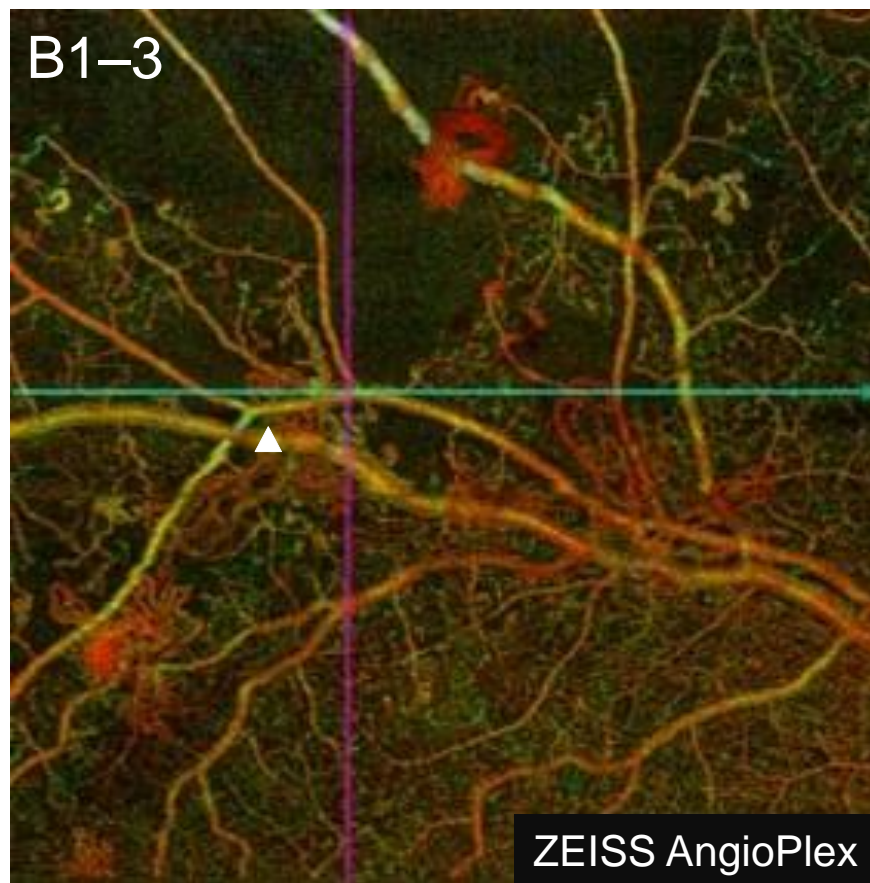
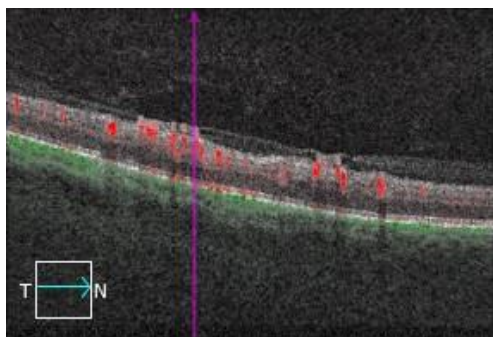
Case study 2: Diabetic retinopathy

OCT-A follow-up



Retina (color coded)

The areas of reduced signal intensity and the altered vascular structures are easy to evaluate in the course of time. This example shows a locally more pronounced vascular network in the follow-up examination.



Follow-up examination (4 months later)

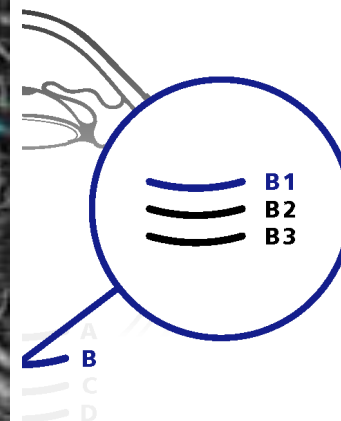
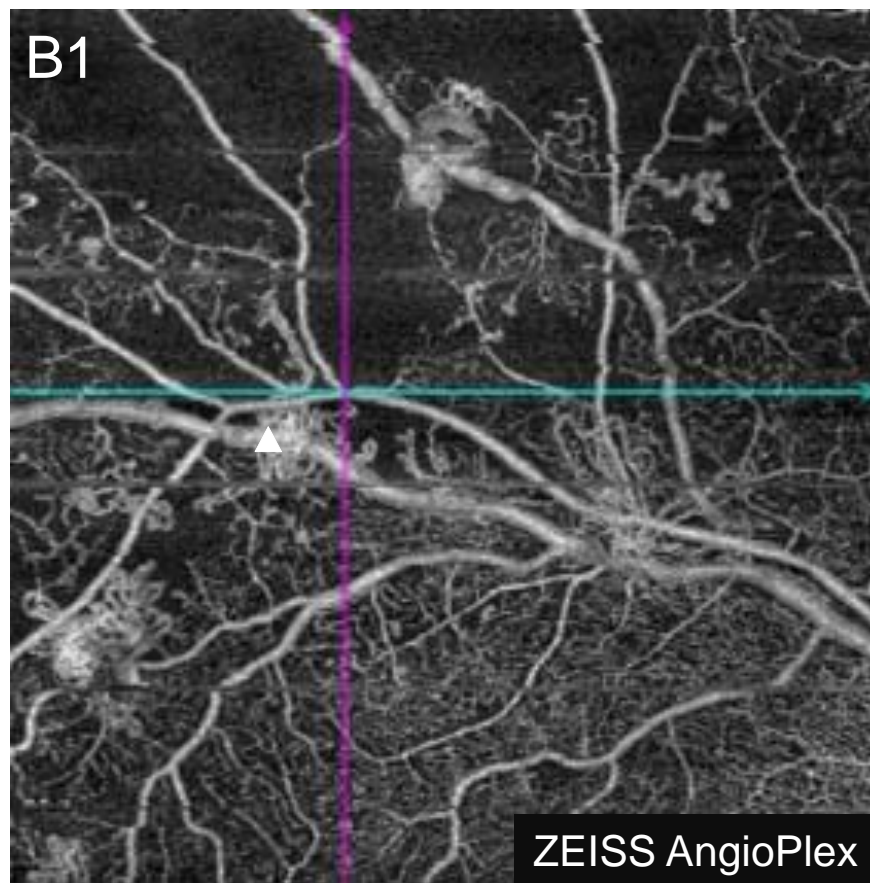
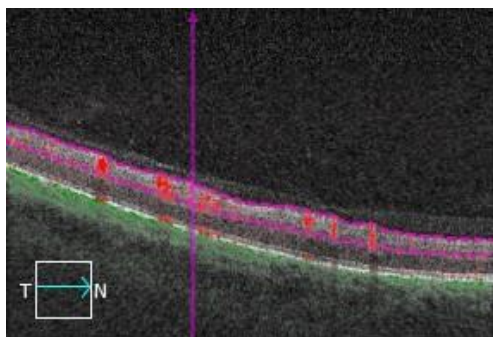
Case study 2: Diabetic retinopathy

OCT-A follow-up



Superficial vascular plexus

The areas of reduced signal intensity and the altered vascular structures are easy to evaluate in the course of time. This example shows a locally more pronounced vascular network in the follow-up examination.



Initial examination

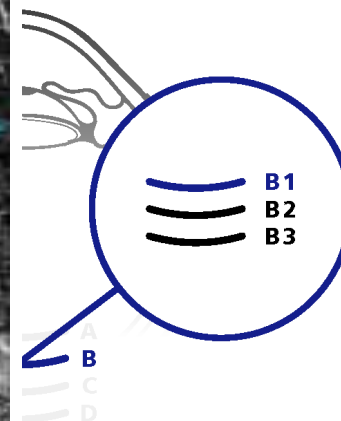
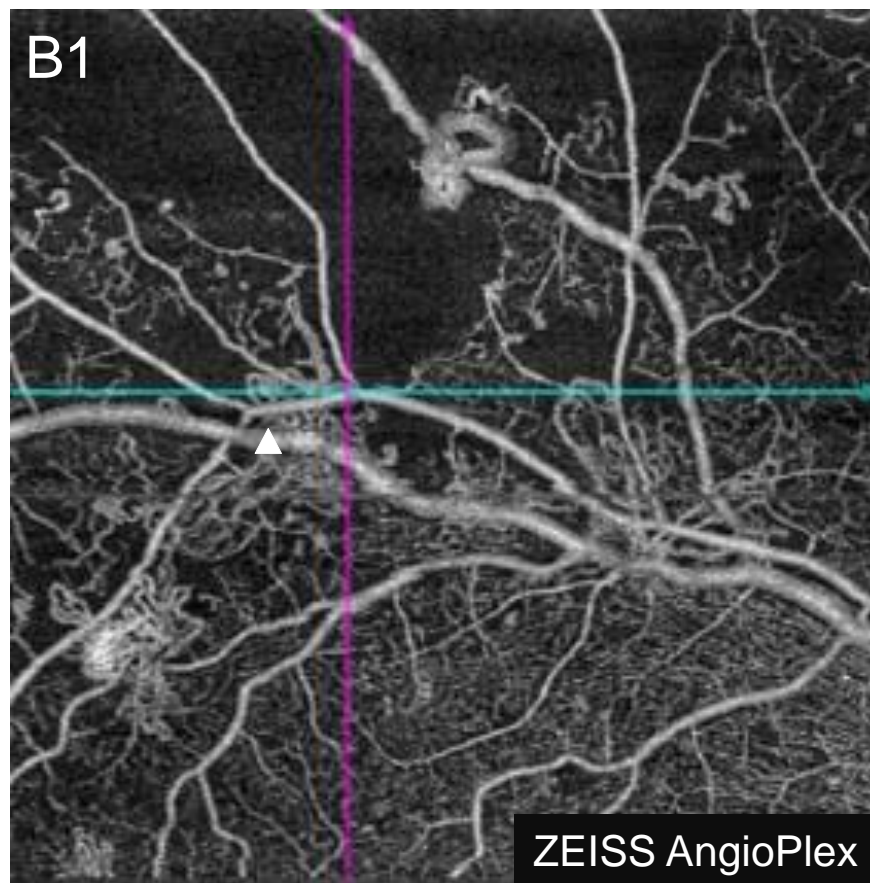
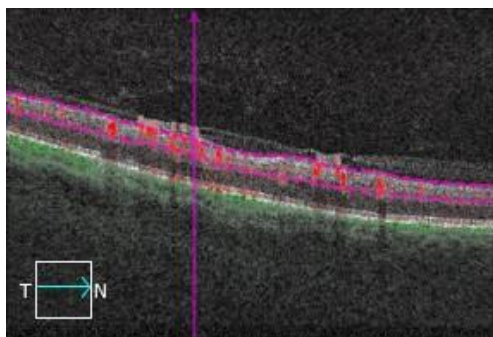
Case study 2: Diabetic retinopathy

OCT-A follow-up



Superficial vascular plexus

The areas of reduced signal intensity and the altered vascular structures are easy to evaluate in the course of time. This example shows a locally more pronounced vascular network in the follow-up examination.



Follow-up examination (4 months later)

Case study 3: Retinal vein occlusion

Overview



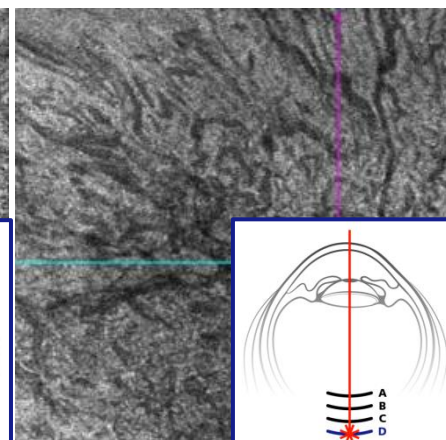
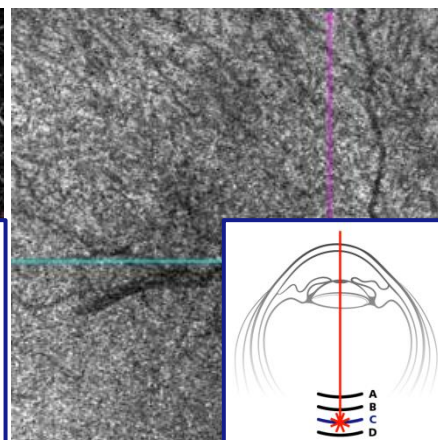
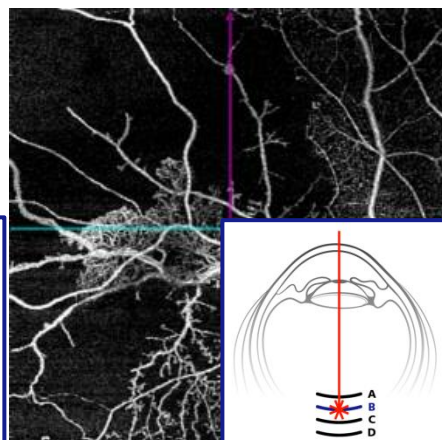
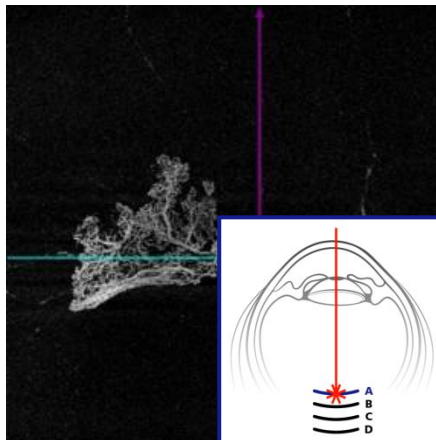
Content

Vitreoretinal interface

Retina

Choriocapillaris

Choroid

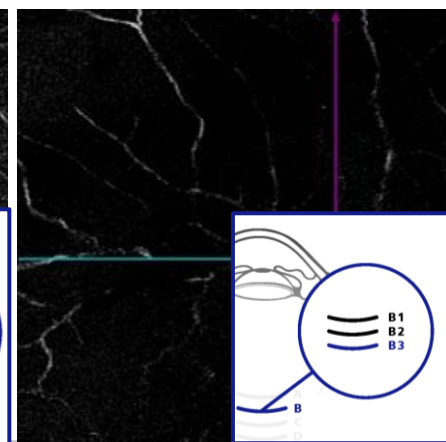
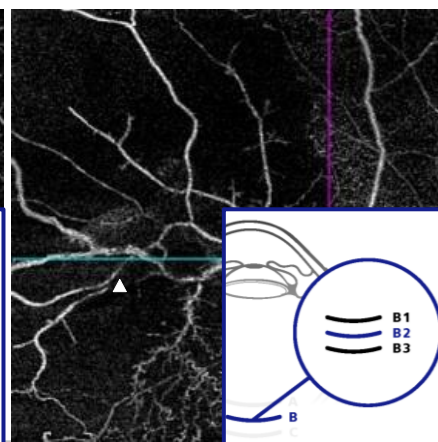
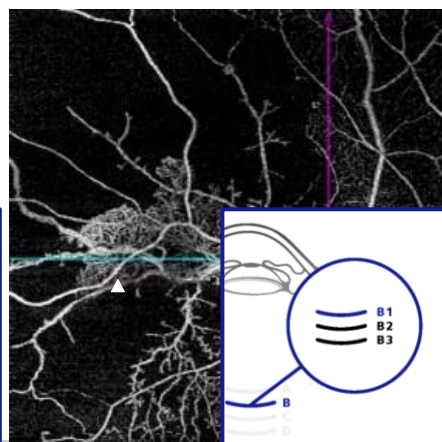
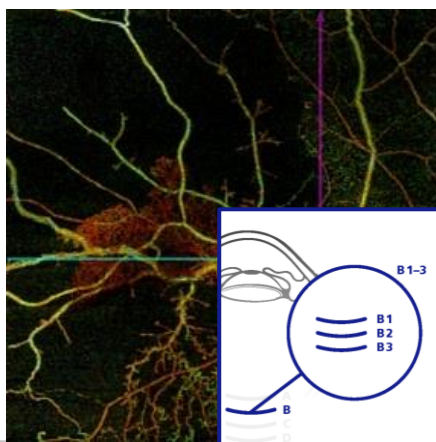


Retina
(color coded)

Superficial
vascular plexus

Deep
vascular plexus

Avascular
zone



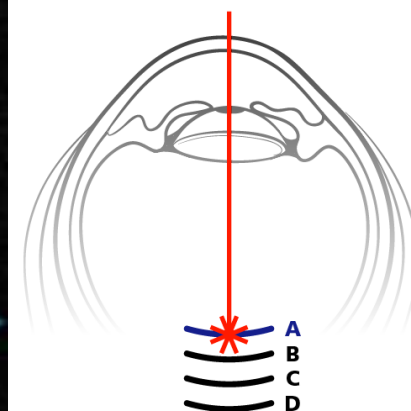
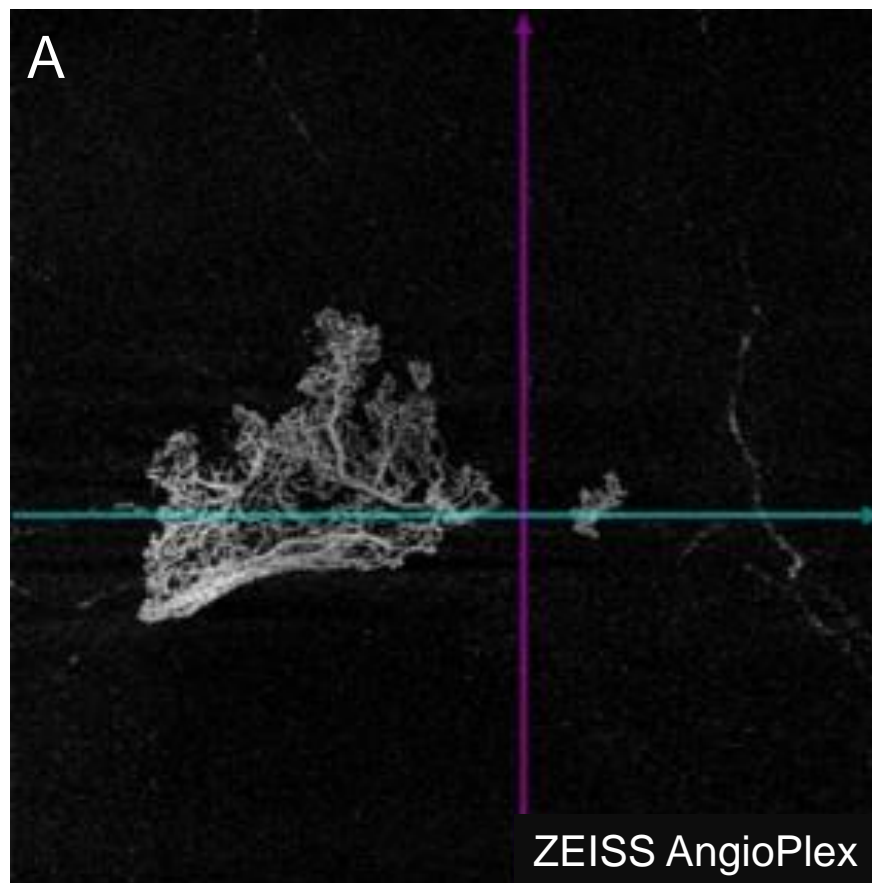
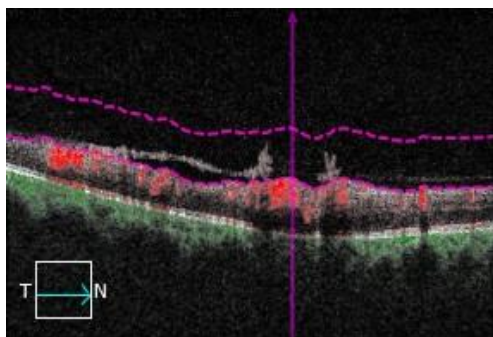
Case study 3: Retinal vein occlusion

OCT-A overview



Vitreoretinal interface

The OCT-A image of the vitreous body interface shows very pronounced and finely branched neovascularizations.



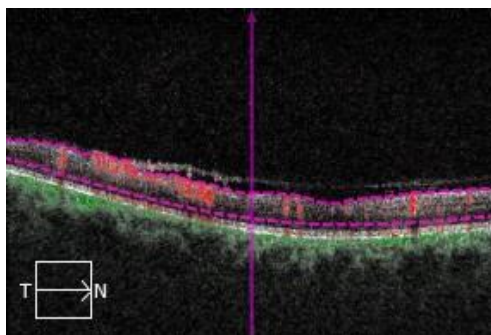
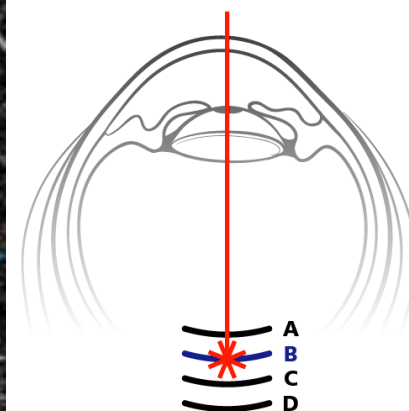
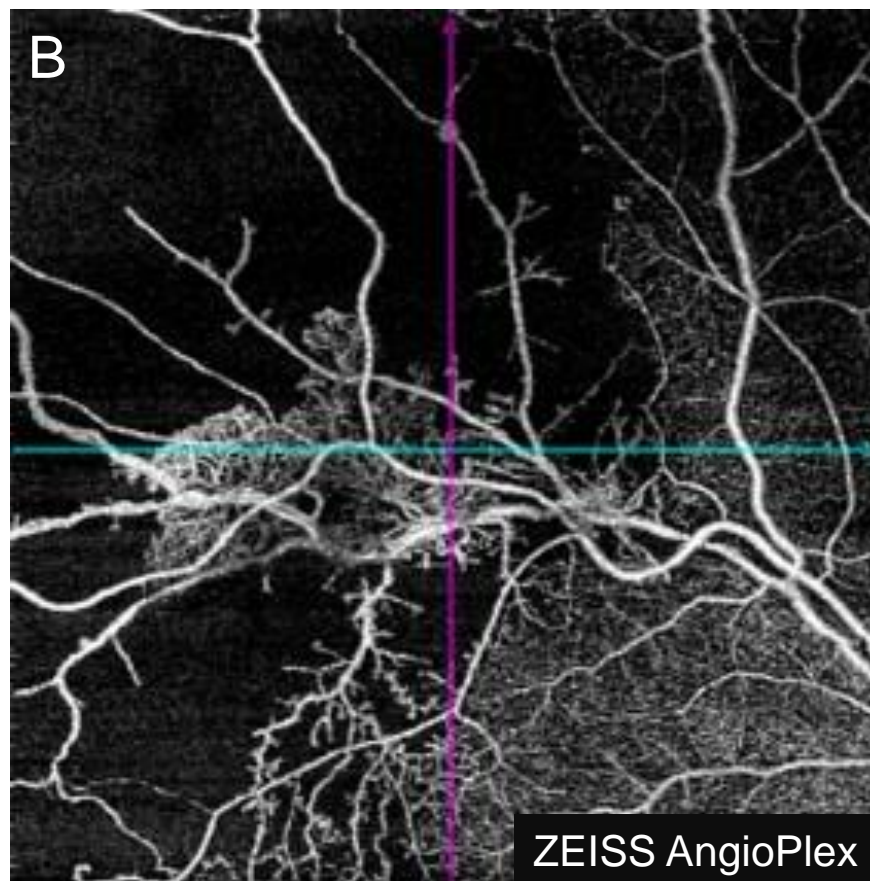
Case study 3: Retinal vein occlusion

OCT-A overview



Retina

The overview display of the retina shows clearly pronounced areas of low signal intensity. This indicates extensive ischemic areas.



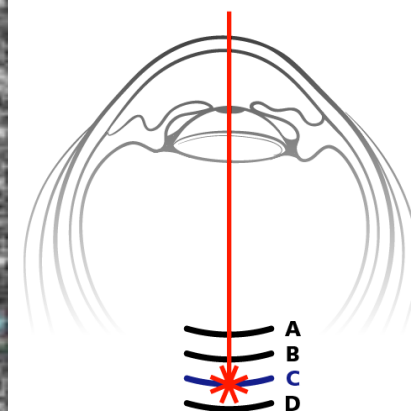
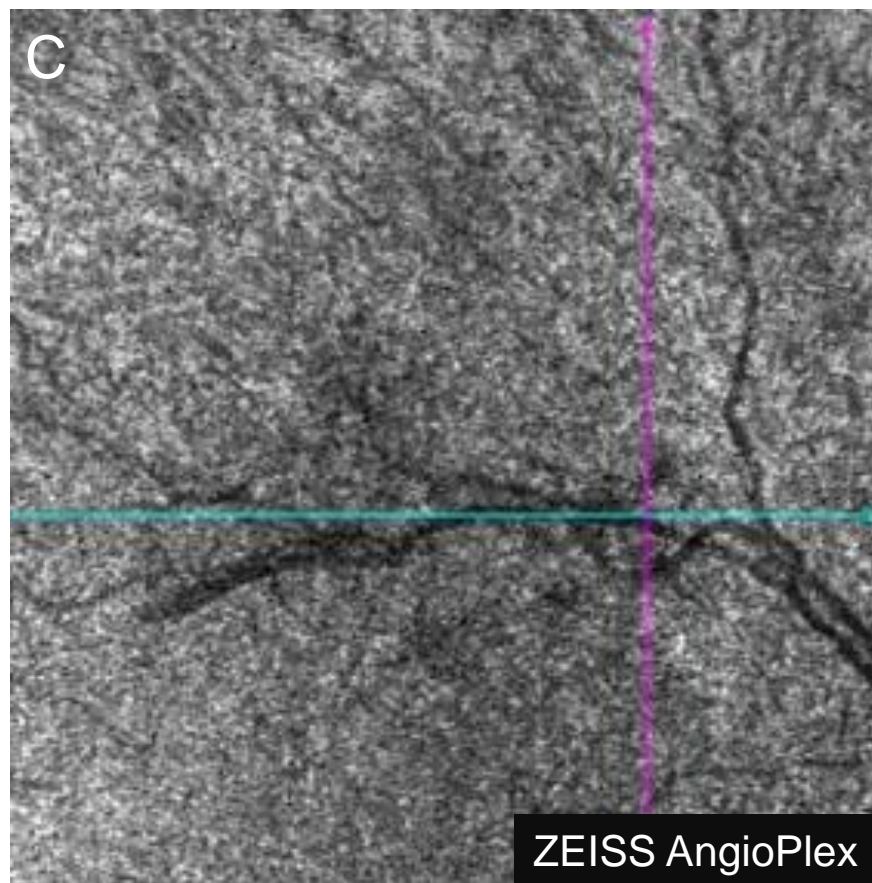
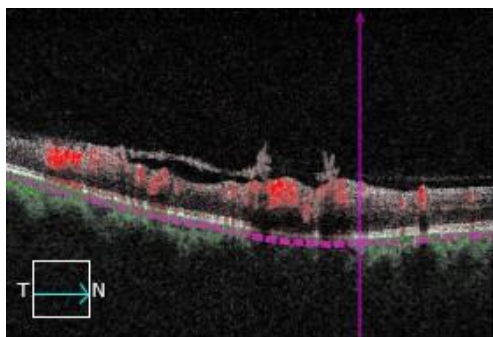
Case study 3: Retinal vein occlusion

OCT-A overview



Choriocapillaris

In the area of the choriocapillaris and choroid, no abnormal changes can be observed.



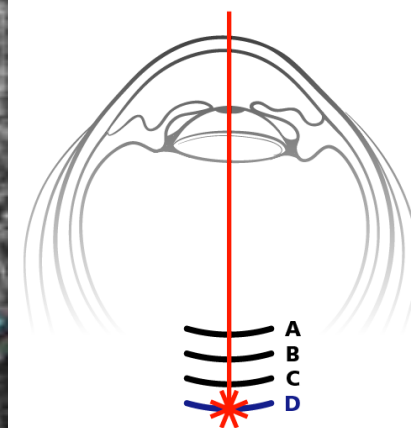
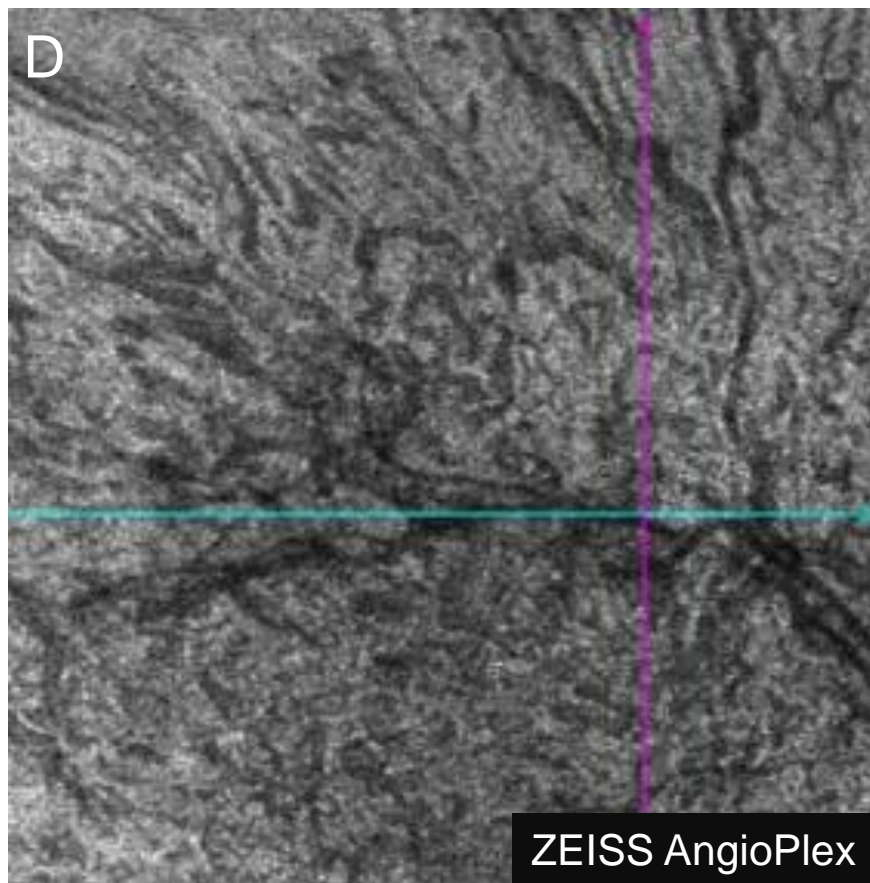
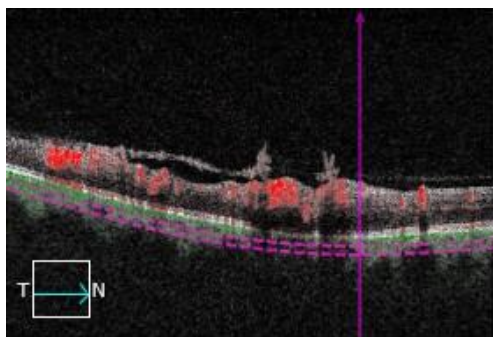
Case study 3: Retinal vein occlusion

OCT-A overview



Choroid

In the area of the choriocapillaris and choroid, no abnormal changes can be observed.



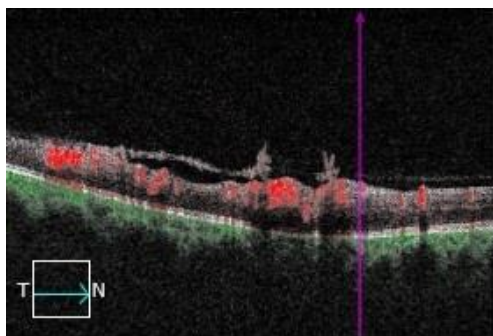
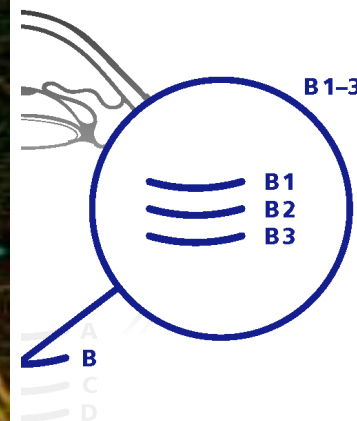
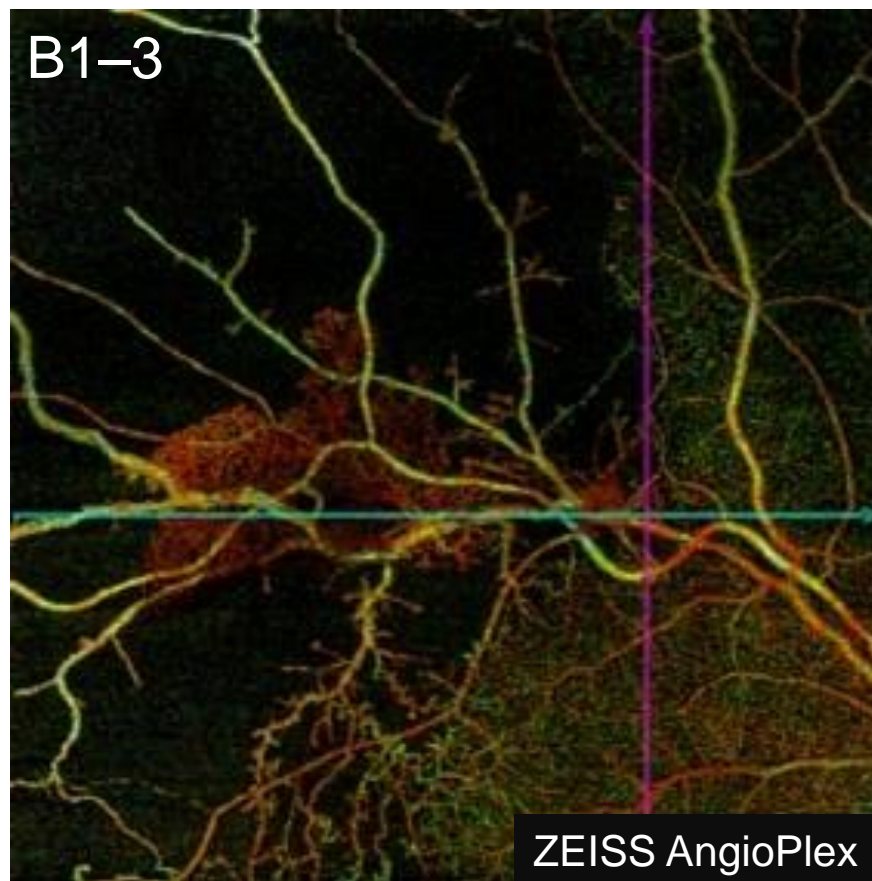
Case study 3: Retinal vein occlusion

OCT-A detailed analysis



Retina (color coded)

The detailed analysis of the retinal layers shows that the hypointense areas without perfusion affect both the superficial and the deep vascular plexus.



Case study 3: Retinal vein occlusion

OCT-A detailed analysis



Overview

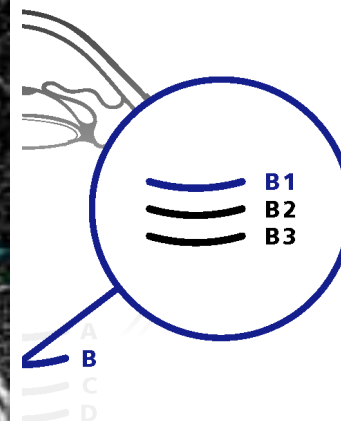
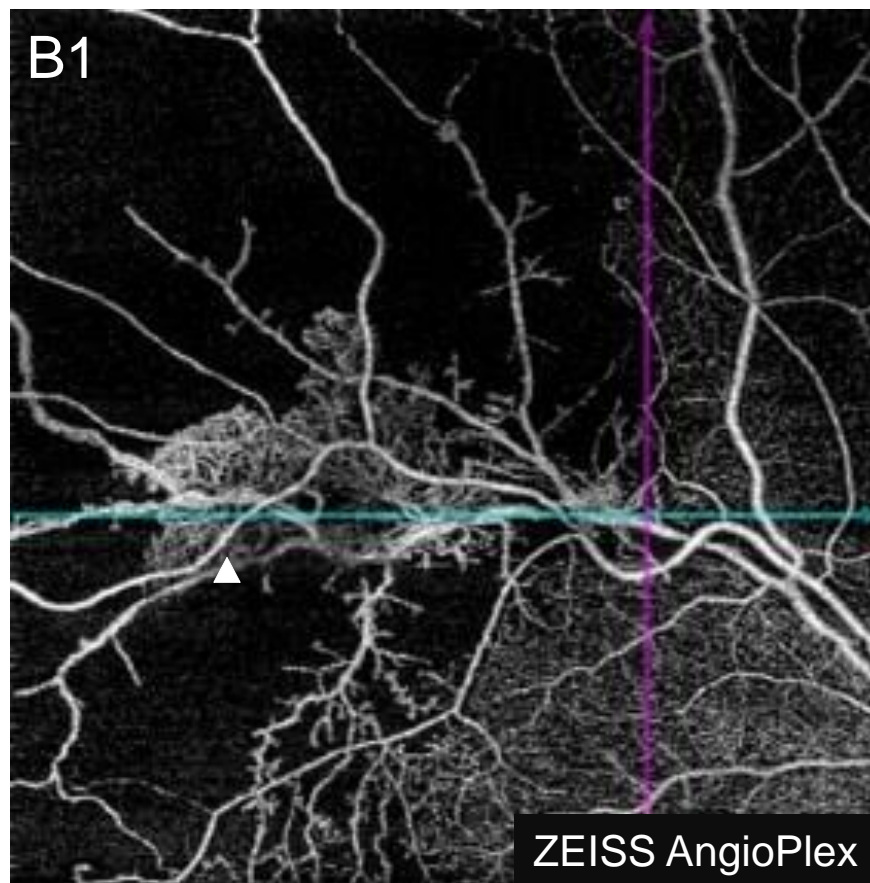
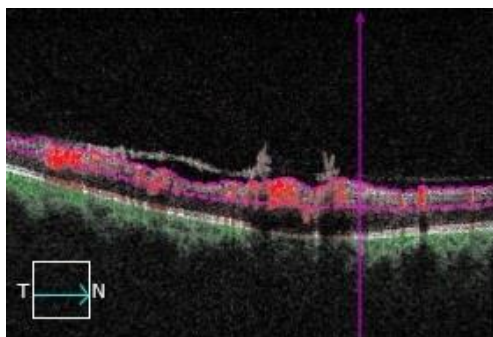


Content



Superficial vascular plexus

An abnormally altered vascular network can be recognized. The localization of this neovascularization agrees well with the abnormal vascular pattern in the vitreous body interface and therefore probably represents a projection artifact.



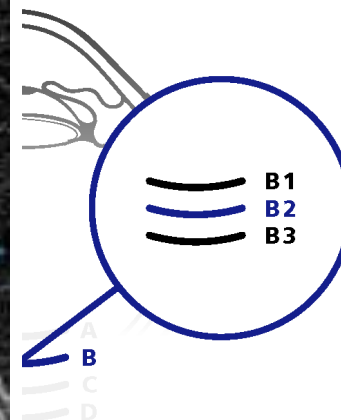
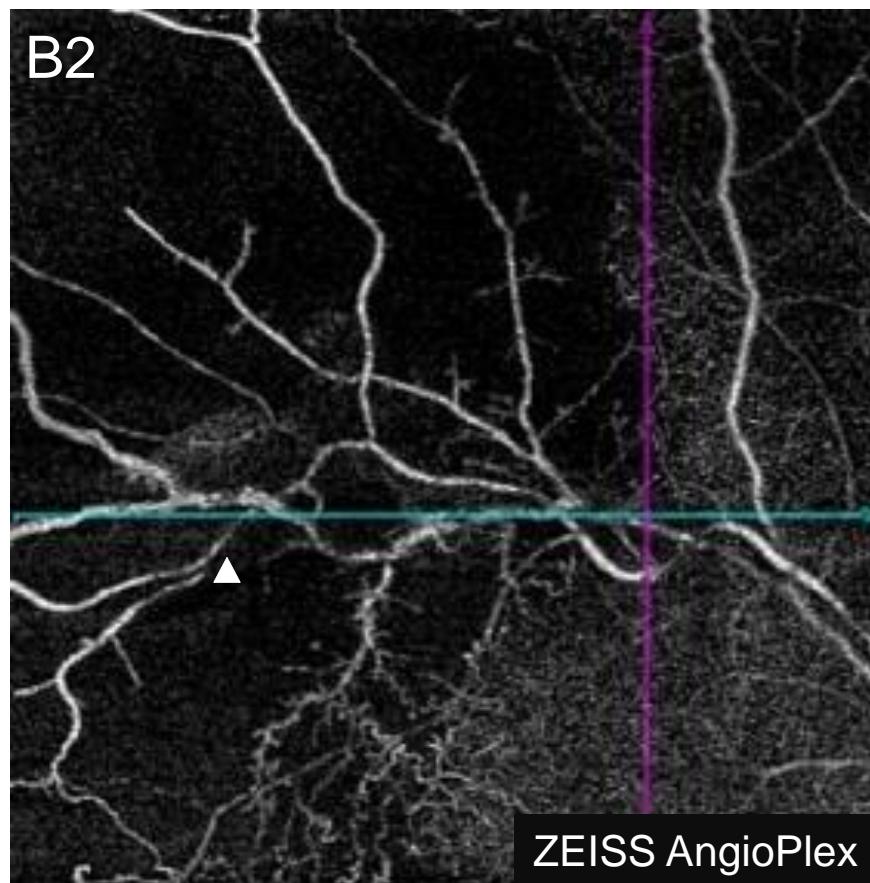
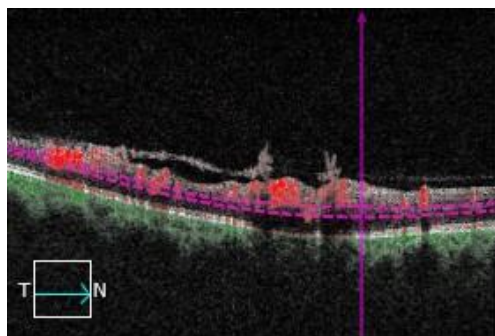
Case study 3: Retinal vein occlusion

OCT-A detailed analysis



Deep vascular plexus

The localization of the visible neovascularization agrees well with the abnormal vascular pattern in the vitreous body interface and therefore probably represents a projection artifact.



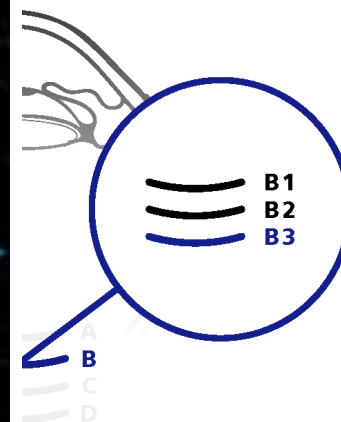
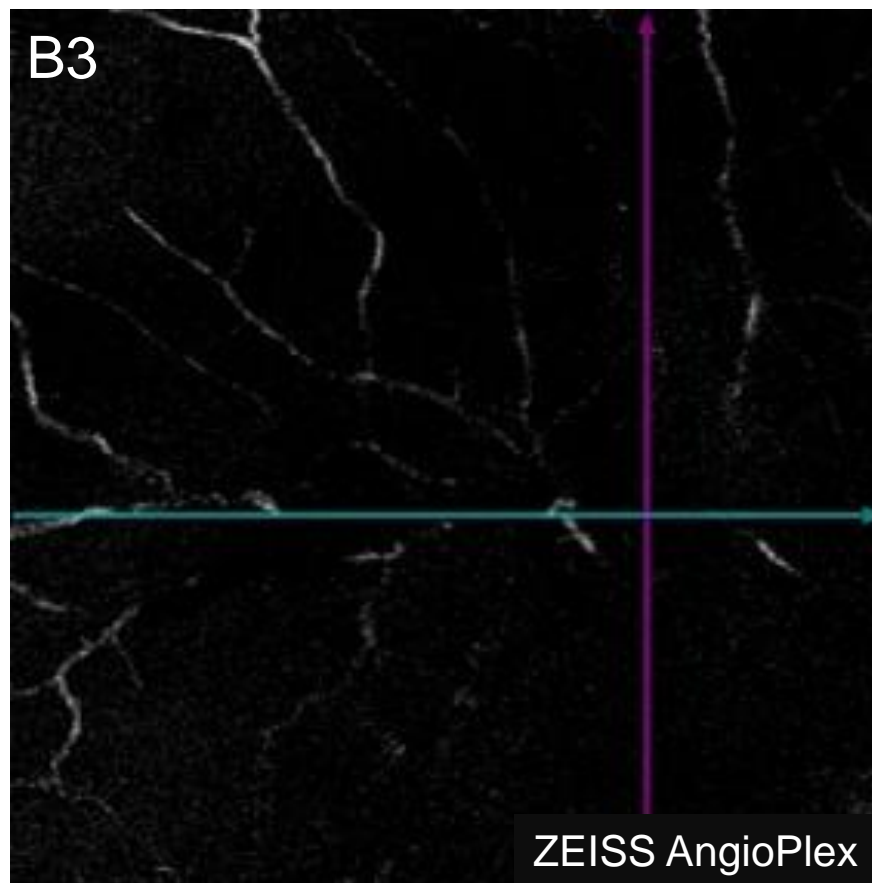
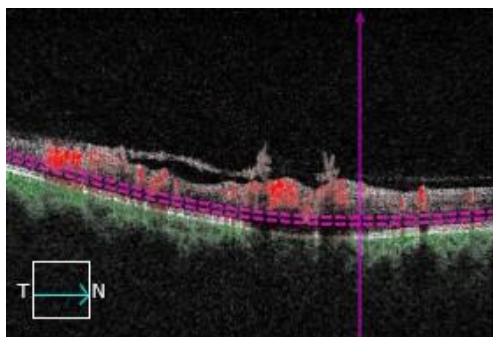
Case study 3: Retinal vein occlusion

OCT-A detailed analysis



Avascular zone

In the avascular zone, projection artifacts of the inner retinal layers can be detected.



Case study 4: Diabetic macular edema

Overview



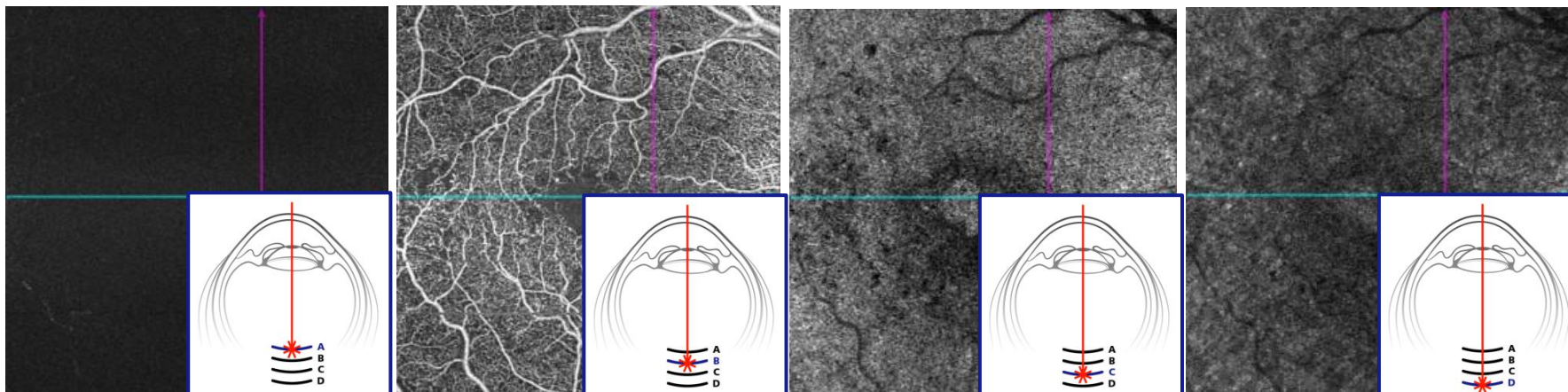
Content

Vitreoretinal interface

Retina

Choriocapillaris

Choroid

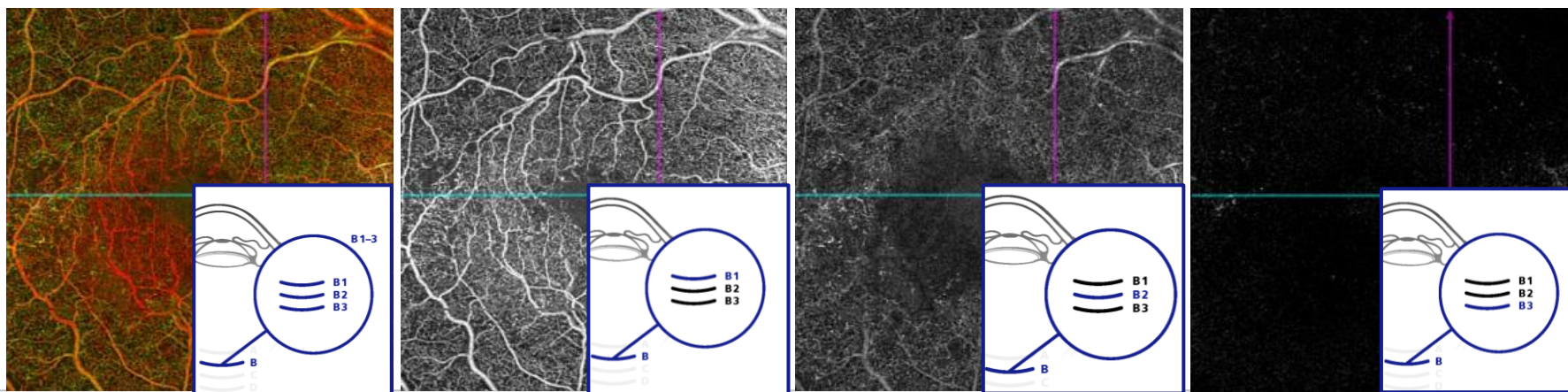


Retina
(color coded)

Superficial
vascular plexus

Deep
vascular plexus

Avascular
zone



Case study 4: Diabetic macular edema

OCT-A overview

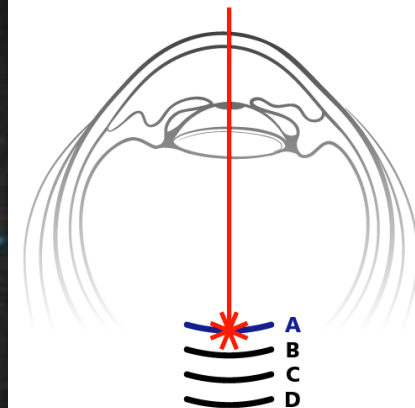
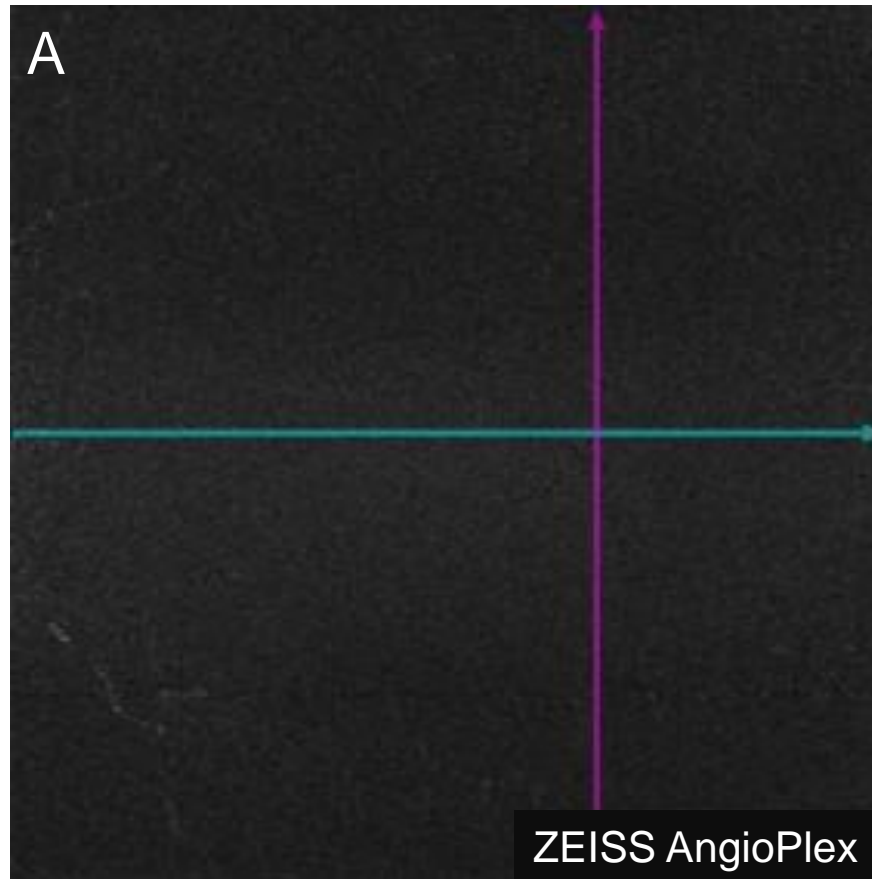
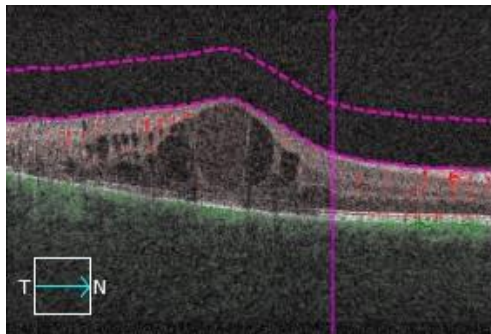


Overview

Content

Vitreoretinal interface

The vitreous body interface shows no particular abnormalities.



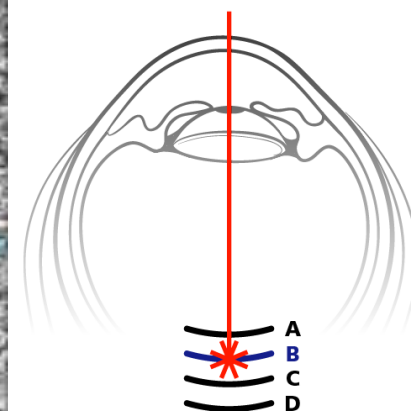
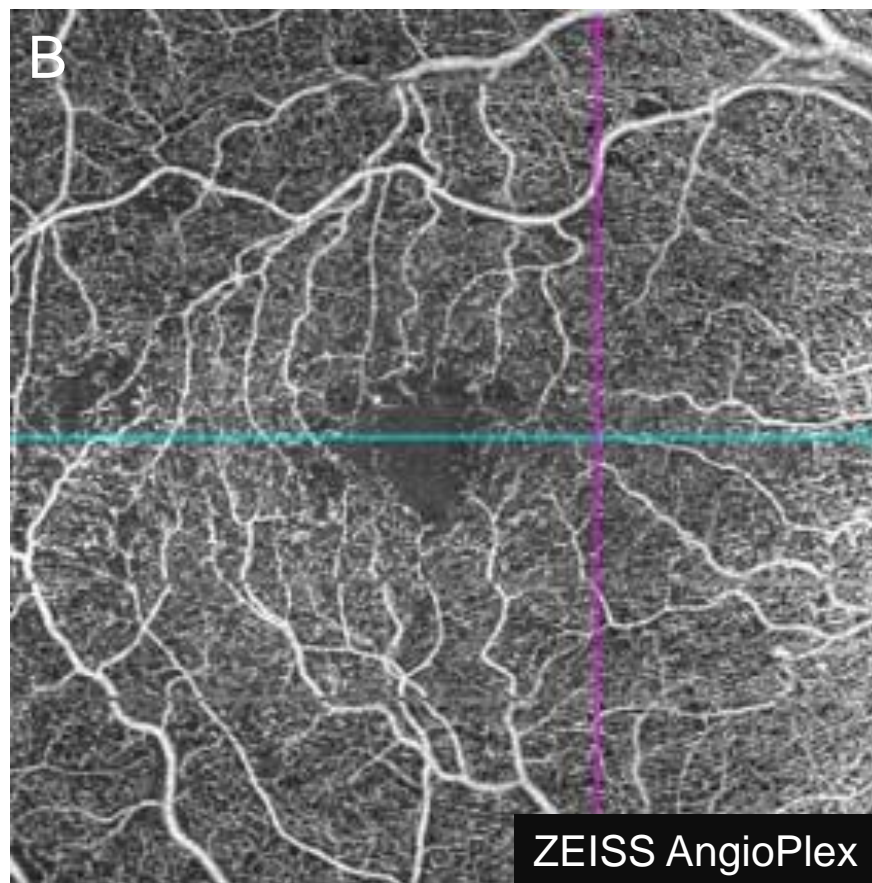
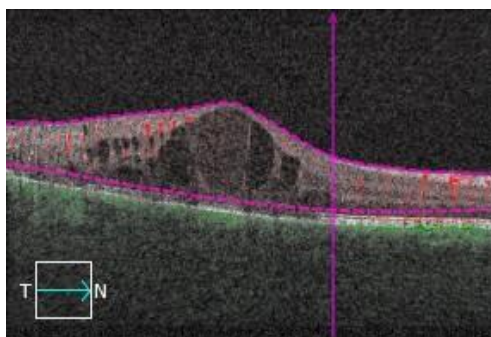
Case study 4: Diabetic macular edema

OCT-A overview



Retina

The OCT angiogram shows an irregularly altered and extended foveal avascular zone. The OCT sectional image shows a pronounced macular edema. Characteristically altered vascular structures are identifiable in the entire image section.



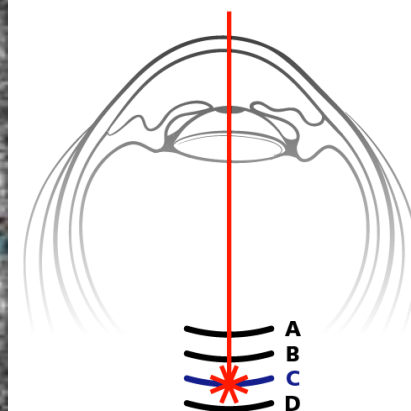
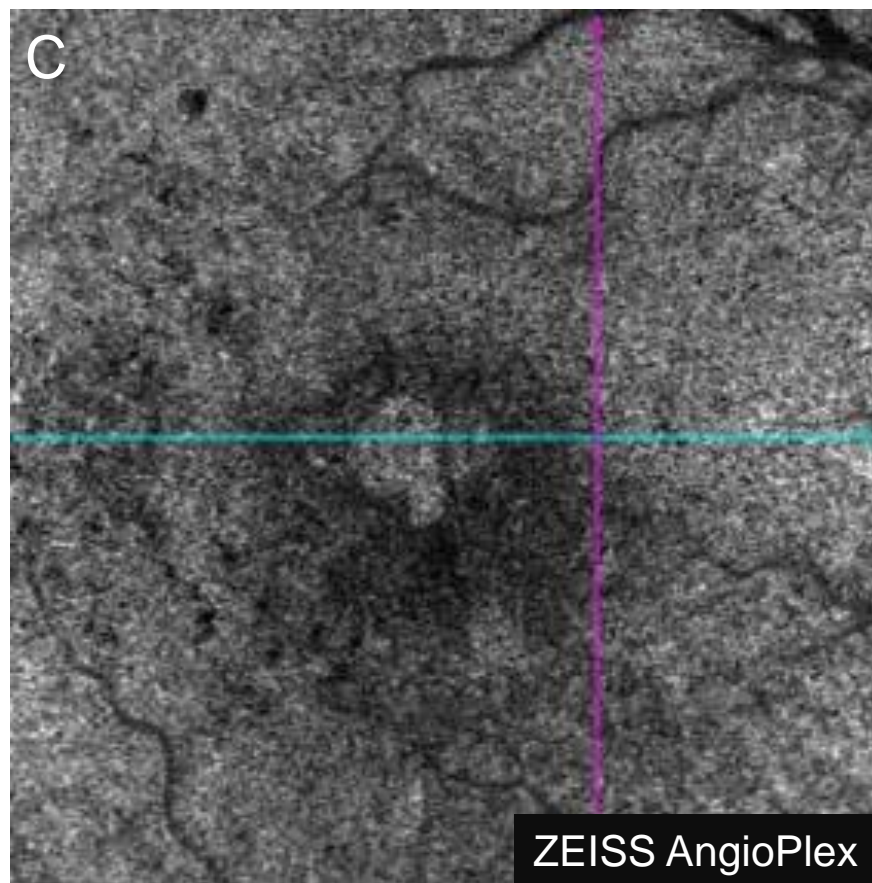
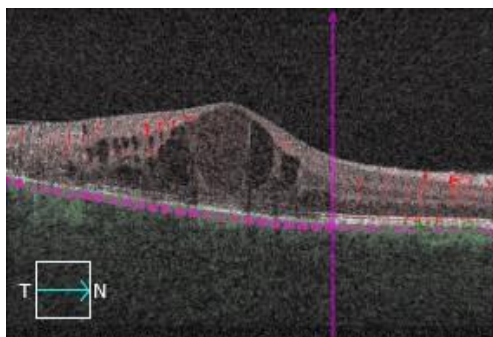
Case study 4: Diabetic macular edema

OCT-A overview



Choriocapillaris

The macular edema leads to shadowing effects in the underlying OCT-A representations of the choriocapillaris and choroid.



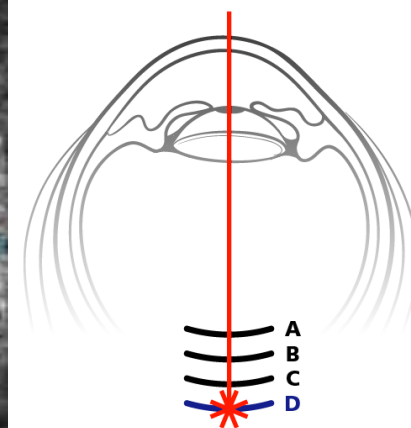
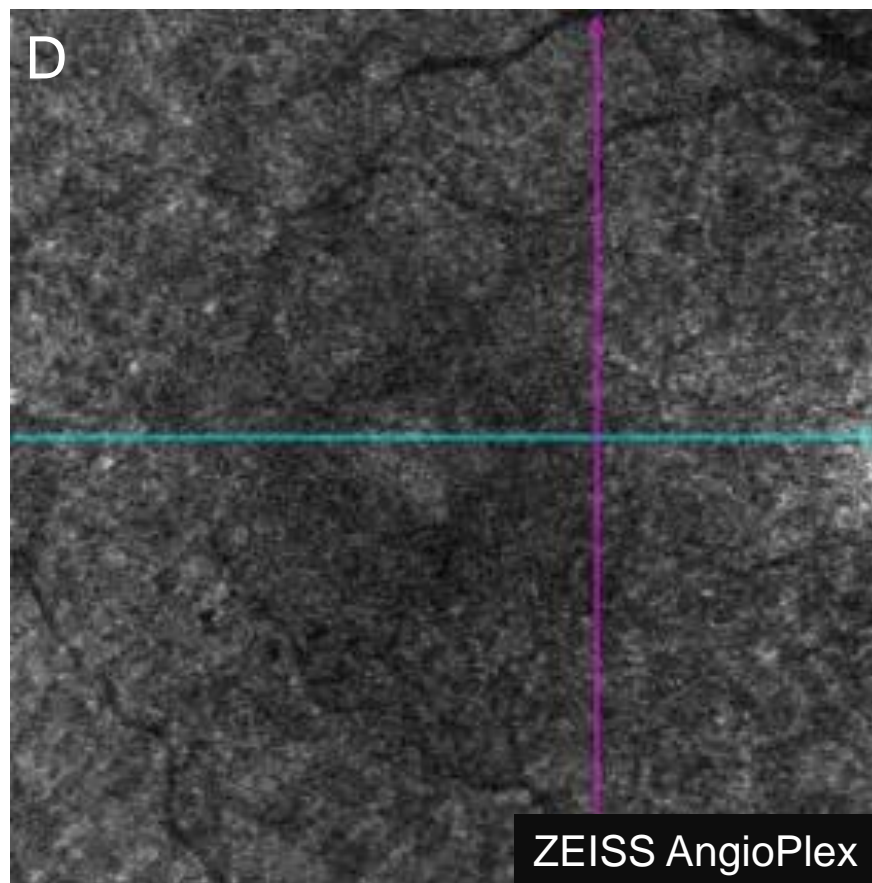
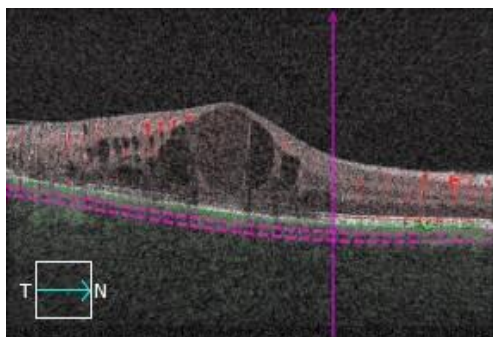
Case study 4: Diabetic macular edema

OCT-A overview



Choroid

The macular edema leads to shadowing effects in the underlying OCT-A representations of the choriocapillaris and choroid.



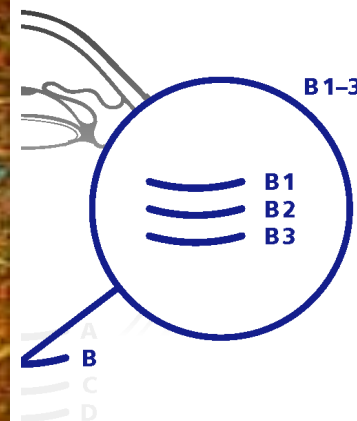
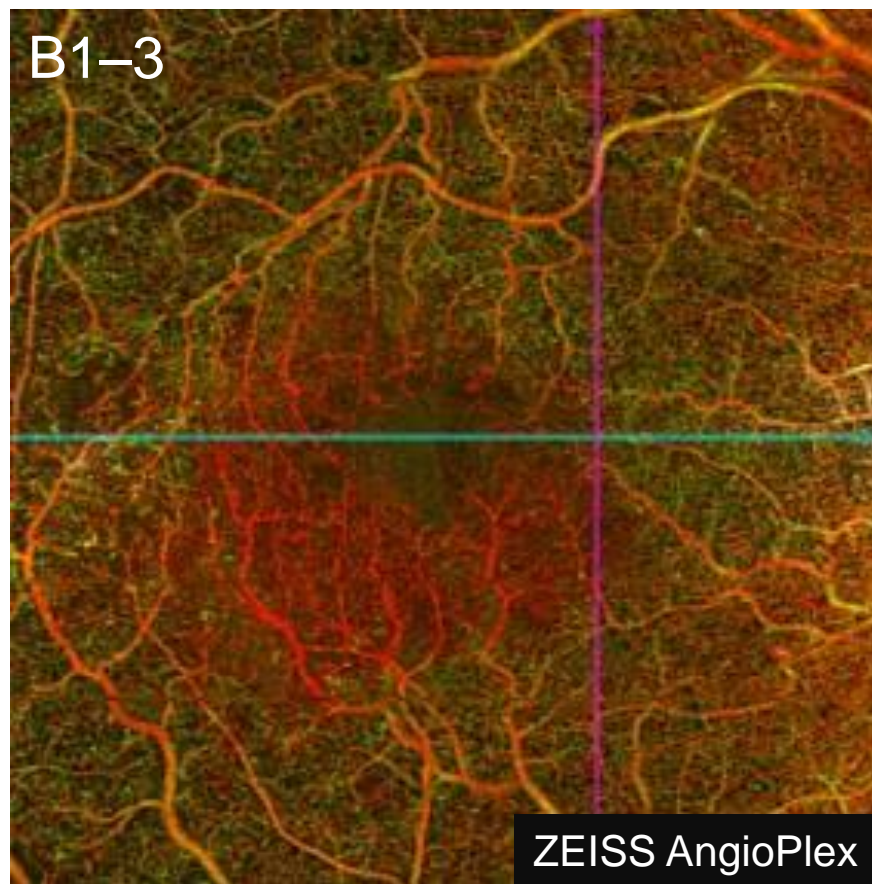
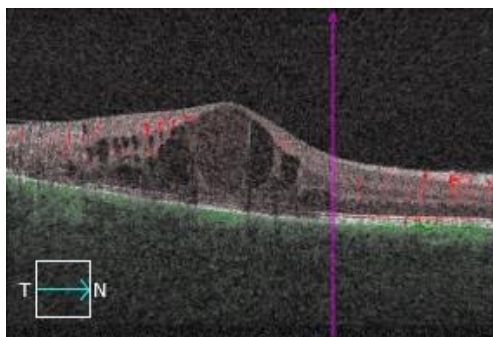
Case study 4: Diabetic macular edema

OCT-A detailed analysis



Retina (color coded)

The color-coded OCT-A representation shows an altered foveal avascular zone and a pronounced red component.



Case study 4: Diabetic macular edema

OCT-A detailed analysis



Overview

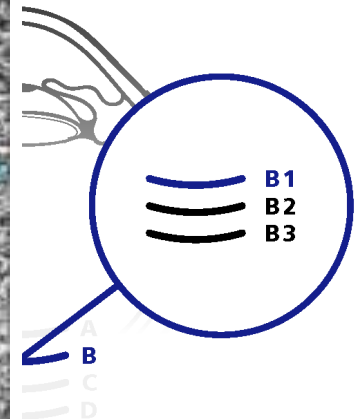
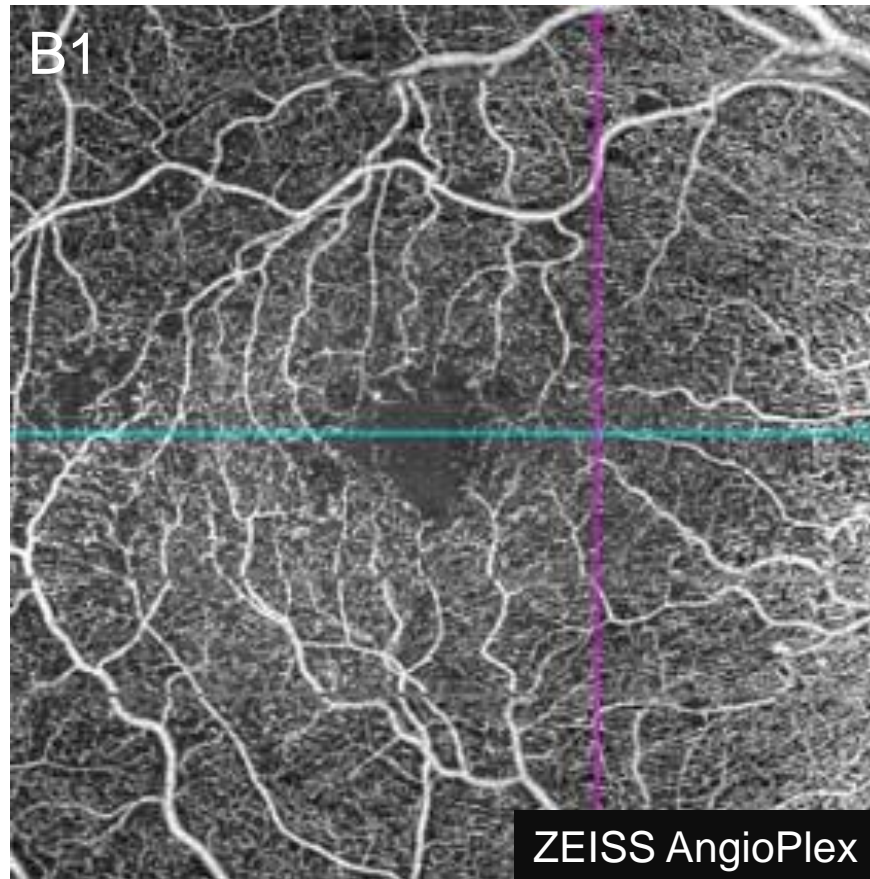
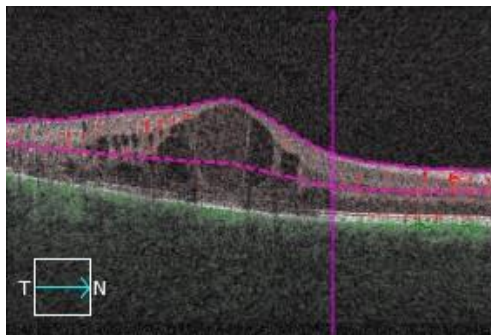


Content



Superficial vascular plexus

The pathological changes in the representation of the superficial vascular plexus can easily be detected.



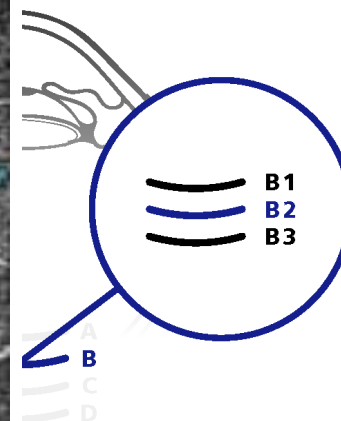
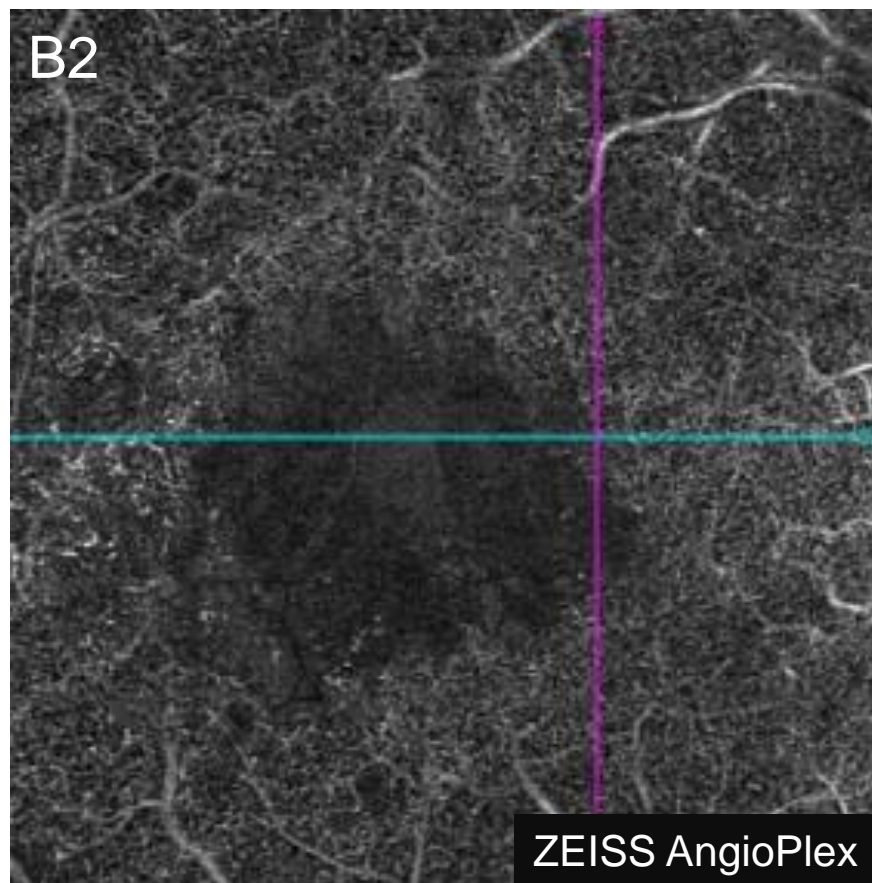
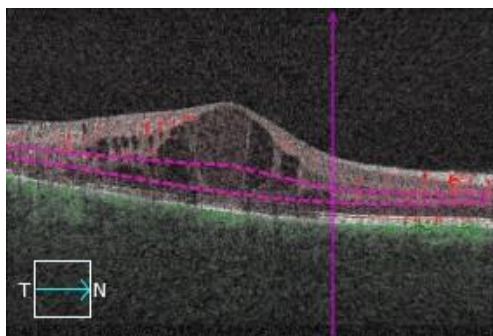
Case study 4: Diabetic macular edema

OCT-A detailed analysis



Deep vascular plexus

In the area of the macula, a reduced signal intensity appears. At this location, the corresponding OCT sectional image shows intraretinal fluid. It cannot be assessed with certainty whether the deep vascular plexus is extensively affected at this location.



Case study 4: Diabetic macular edema

OCT-A detailed analysis



Overview



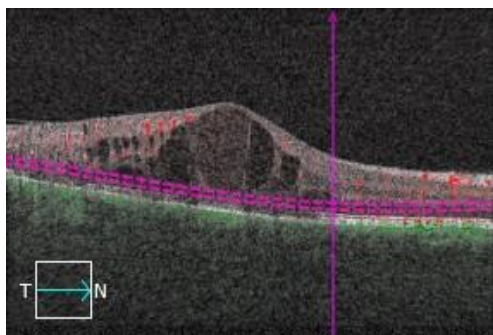
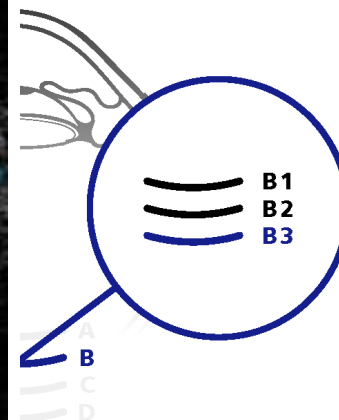
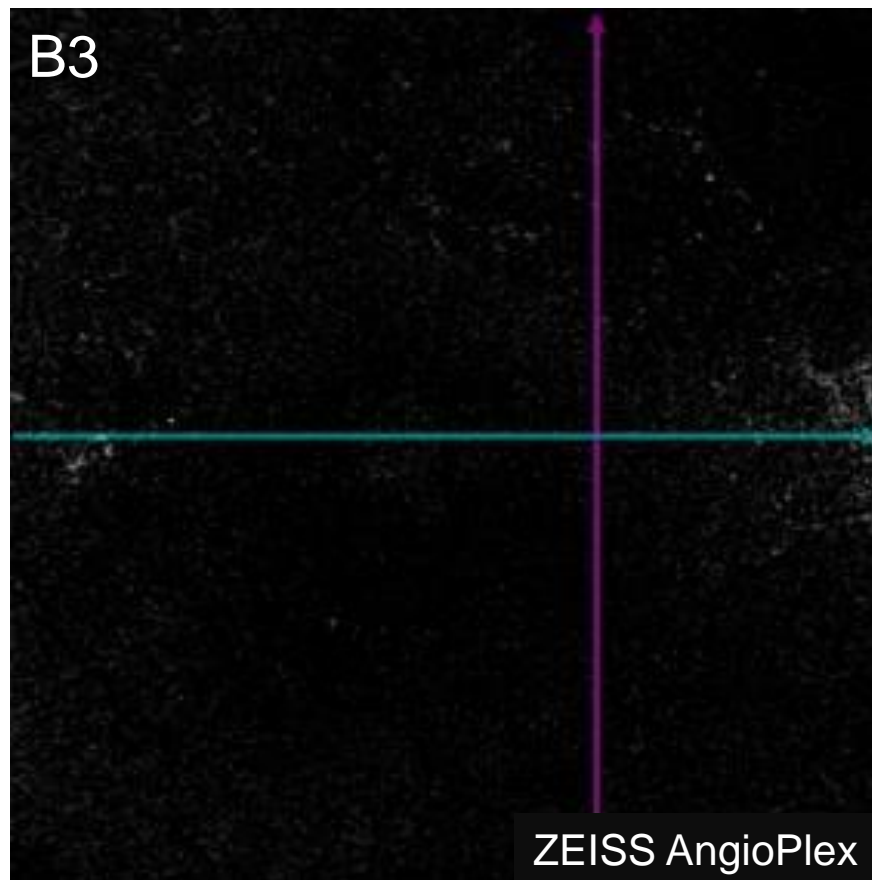
Content



Avascular zone

In the avascular area, there are no particular abnormalities.

B3



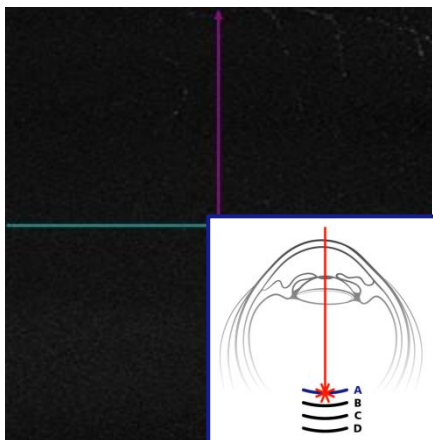
Case study 5: Macular telangiectasia

Overview

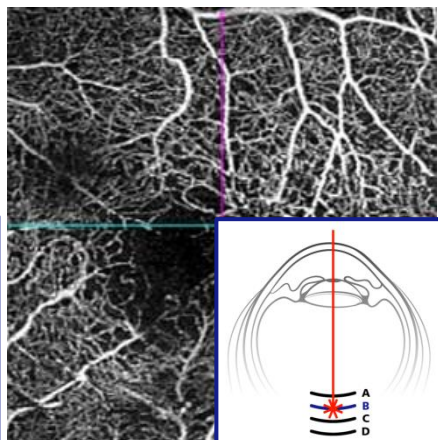


Content

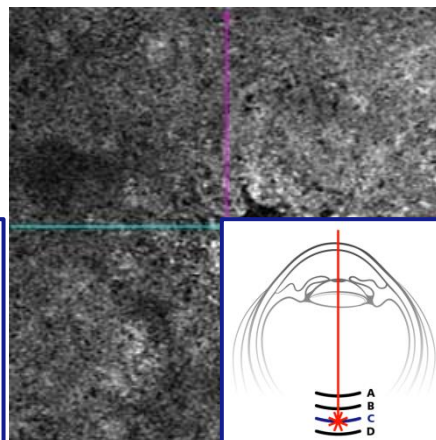
Vitreoretinal interface



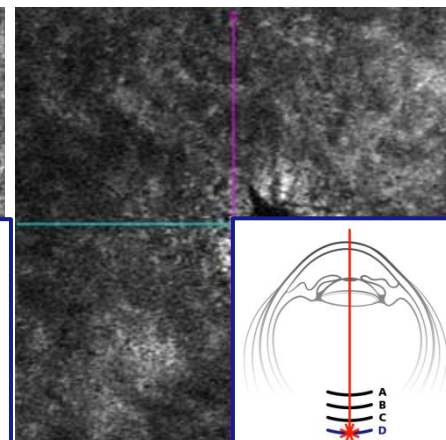
Retina



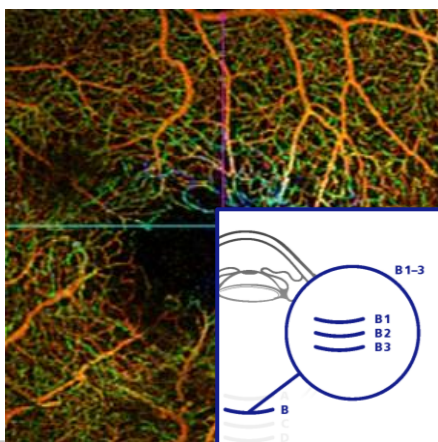
Choriocapillaris



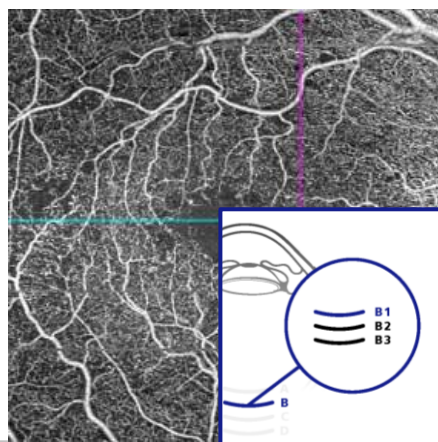
Choroid



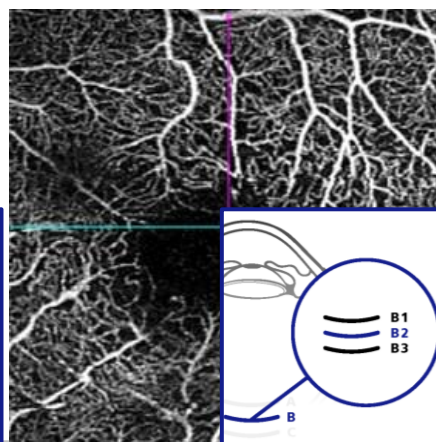
Retina
(color coded)



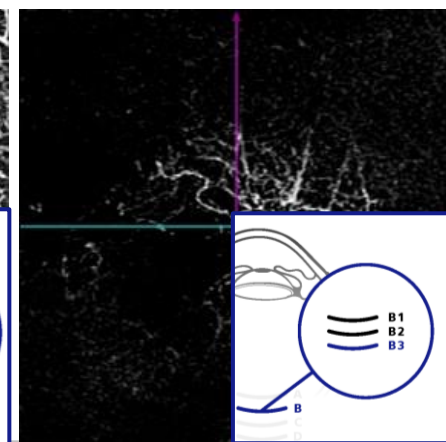
Superficial
vascular plexus



Deep
vascular plexus



Avascular
zone

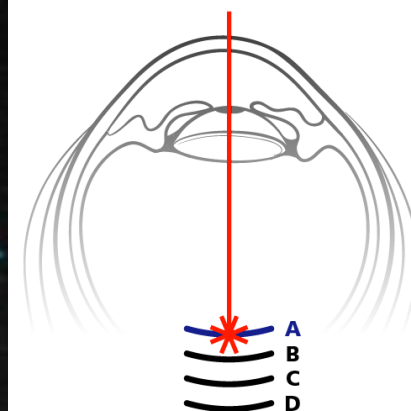
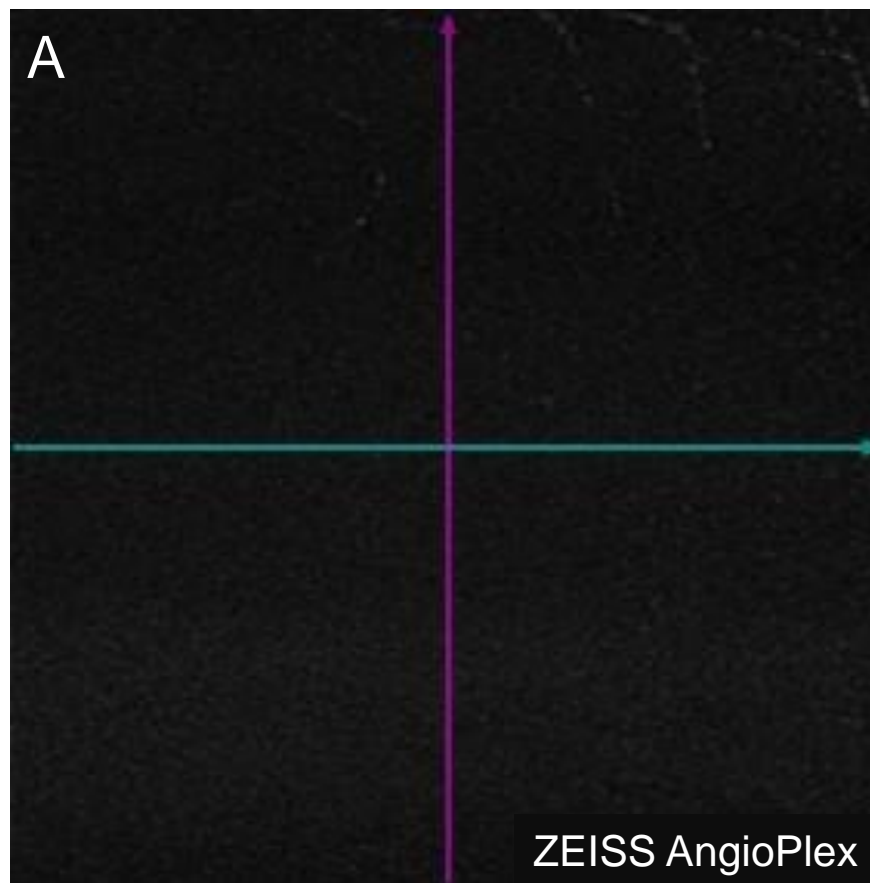
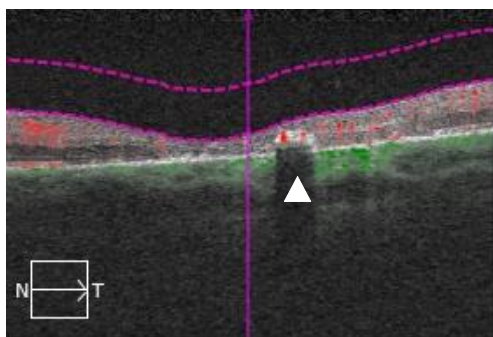


Case study 5: Macular telangiectasia OCT-A overview



Vitreoretinal interface

The overview image of the vitreoretinal interface shows no abnormalities.



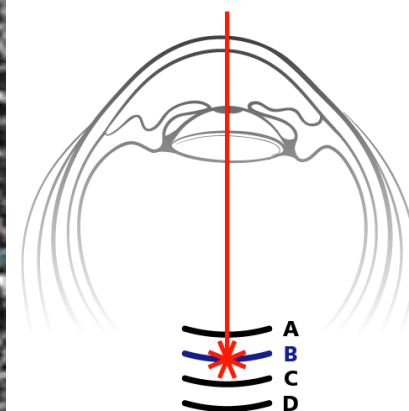
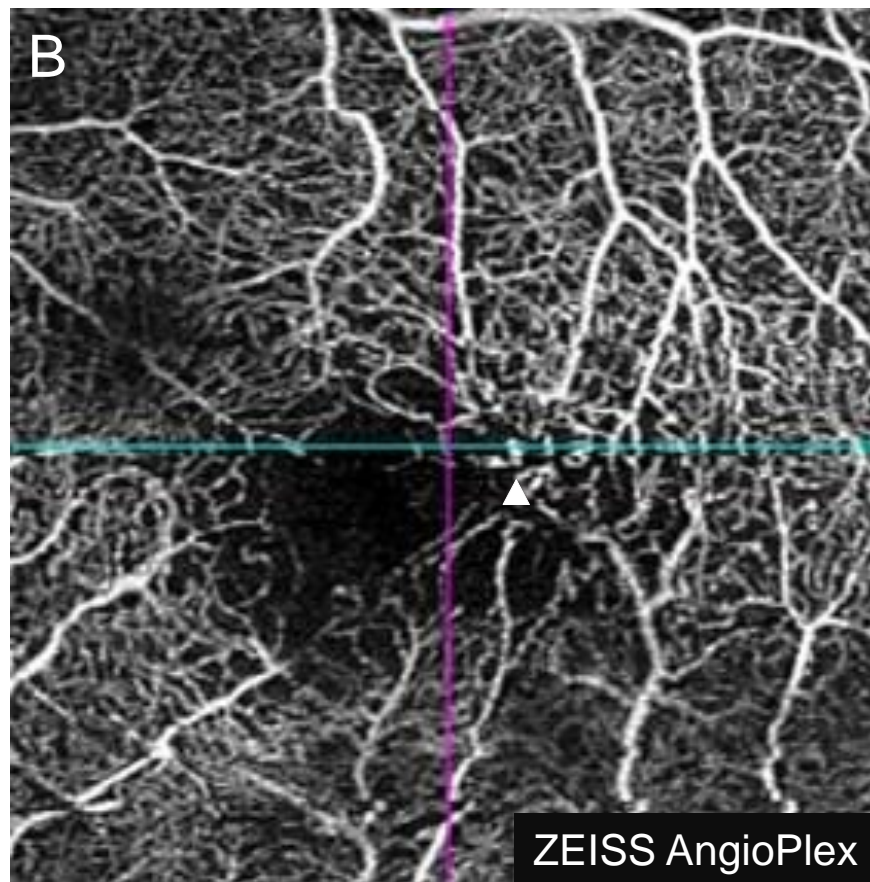
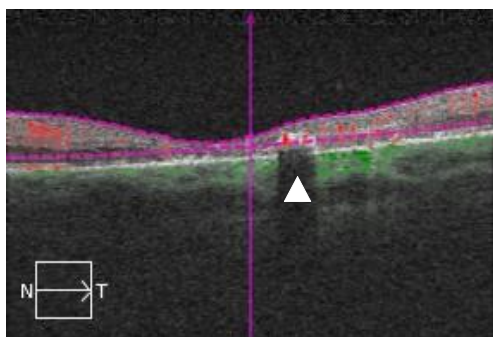
Case study 5: Macular telangiectasia

OCT-A overview



Retina

The overview image of the retina shows a parafoveally dispersed vascular structure. In the OCT sectional image, a detachment of the RPE can be observed in this area.



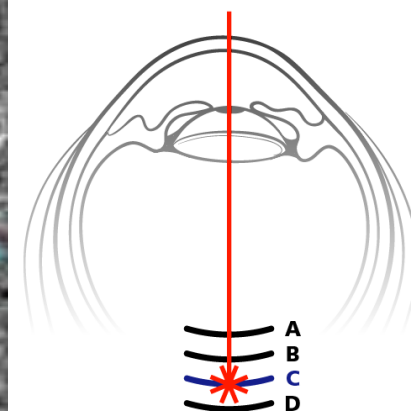
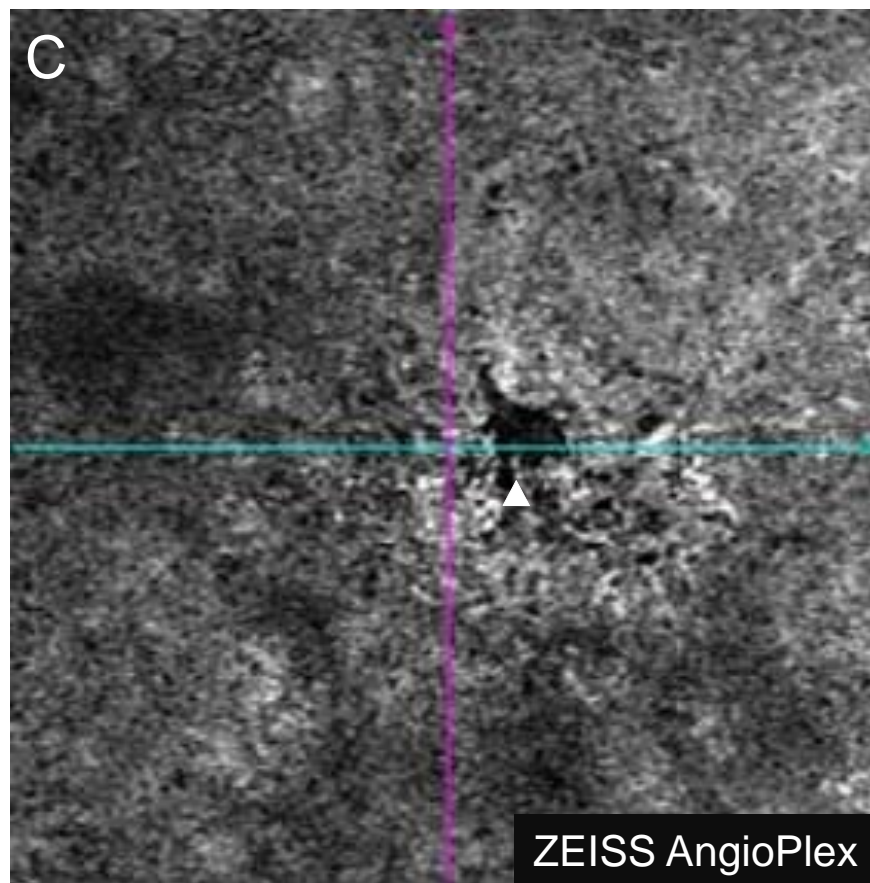
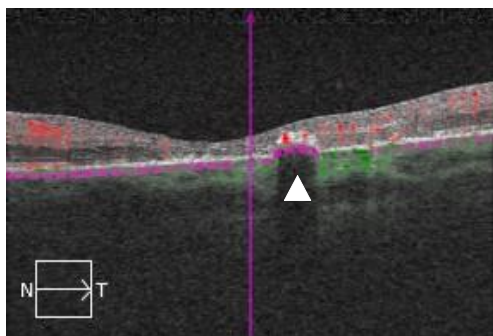
Case study 5: Macular telangiectasia

OCT-A overview



Choriocapillaris

At this location in the representation of the choroid and the choriocapillaris, hypointense areas can be seen. These are shadowing effects caused by RPE detachment.



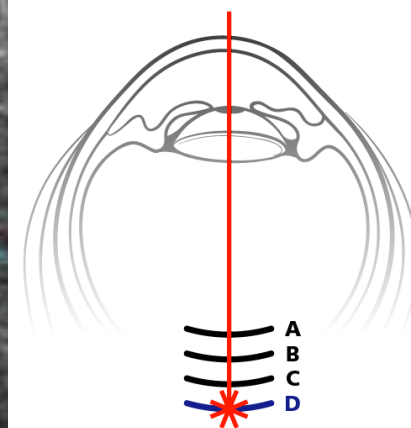
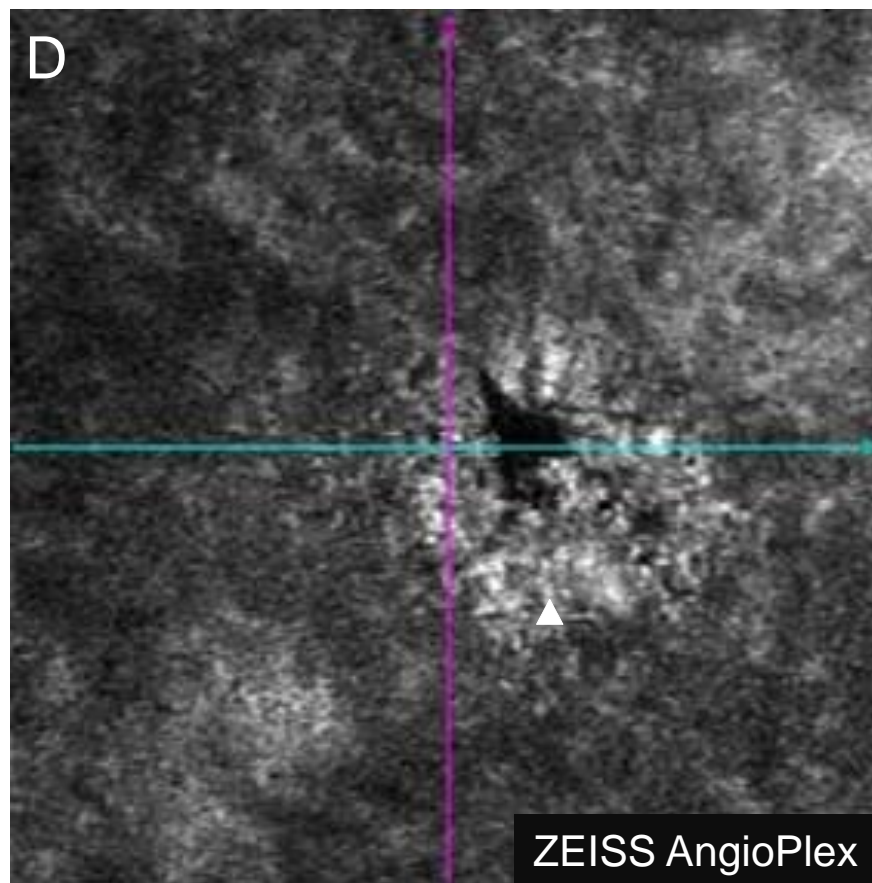
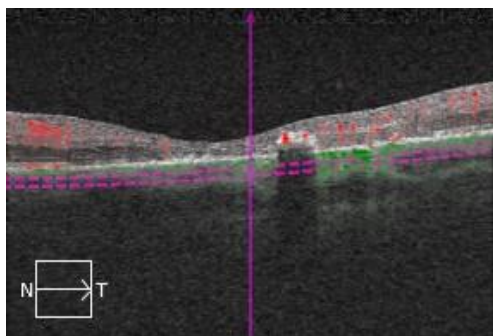
Case study 5: Macular telangiectasia

OCT-A overview



Choroid

The surrounding hyperintense margin probably comes from window effects of the extensively and diffusely dispersed vascular structures in the overlying layers.



Case study 5: Macular telangiectasia

OCT-A detailed analysis



Overview

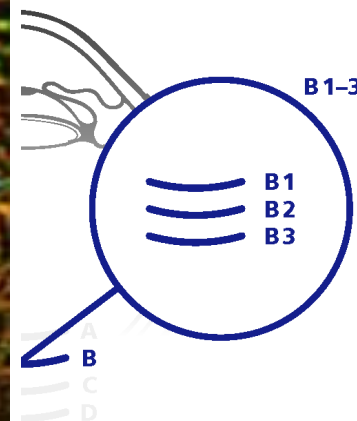
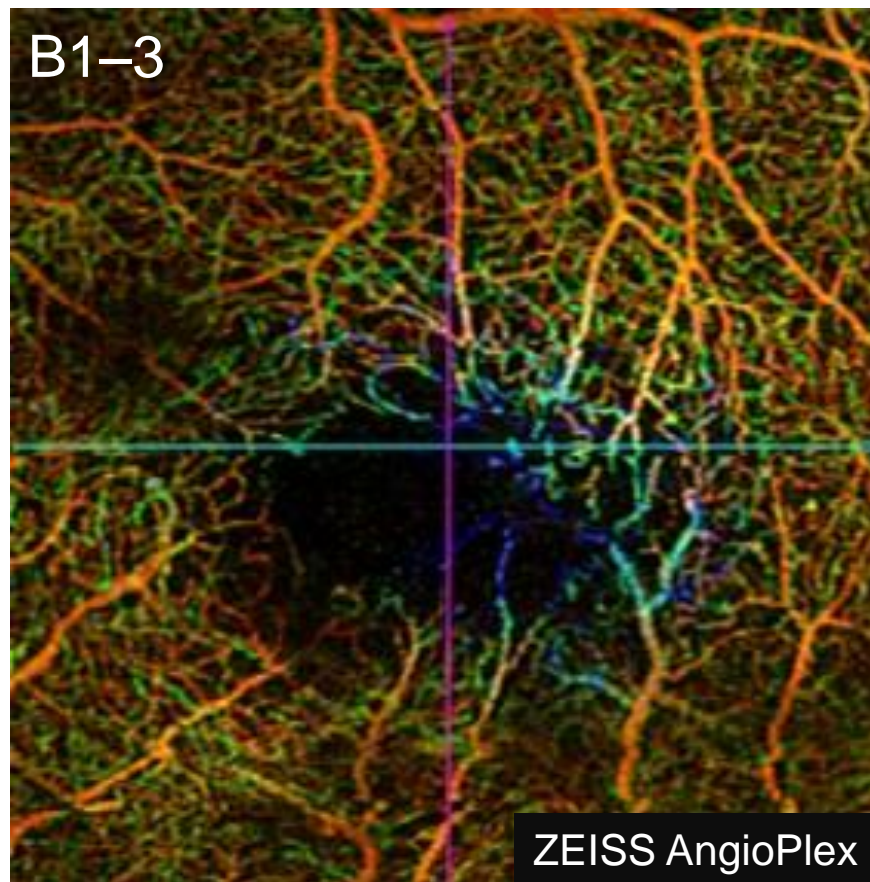
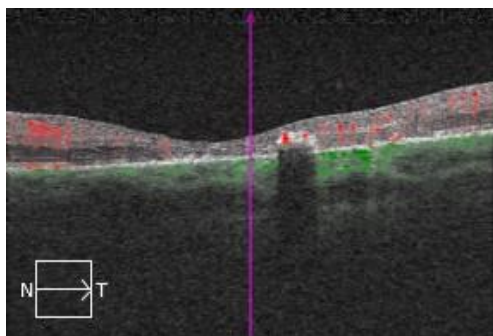


Content



Retina (color coded)

In the color-coded representation of the retina, the dispersed vascular structure appears with a pronounced blue component.



Case study 5: Macular telangiectasia OCT-A detailed analysis



Overview

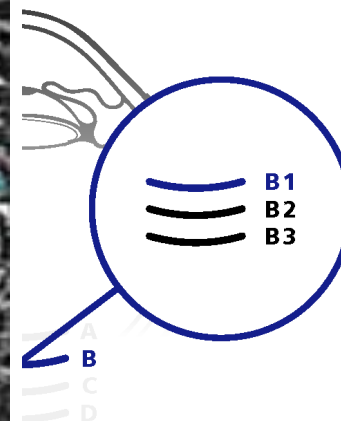
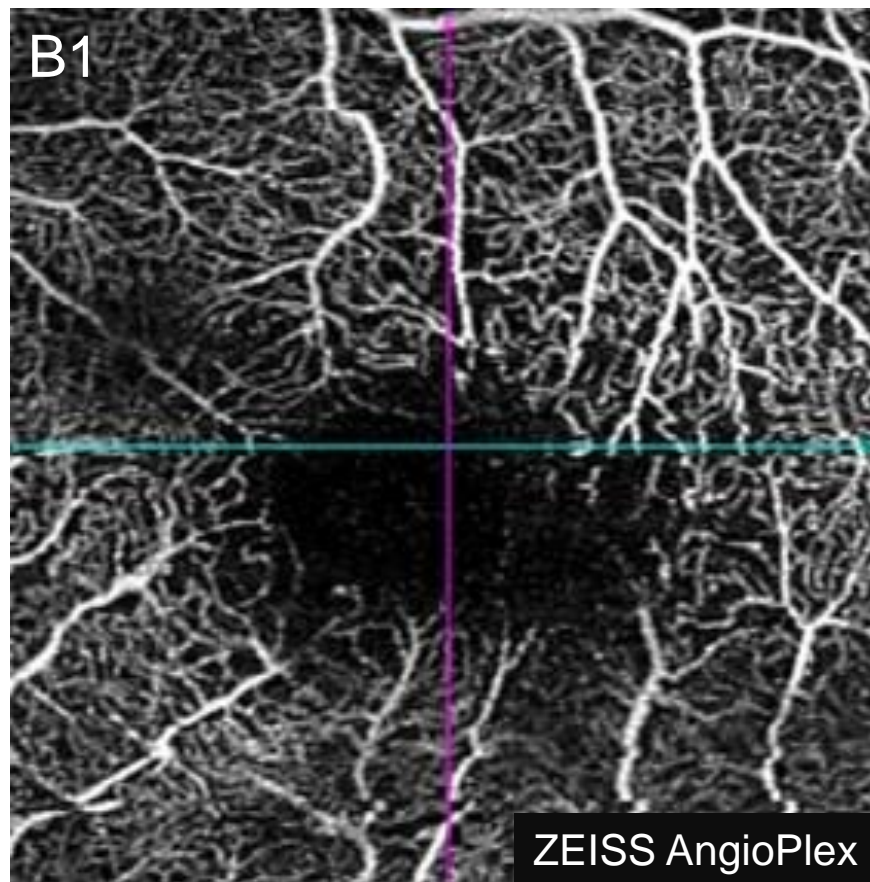
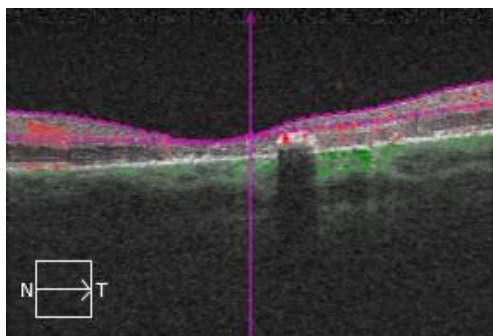


Content



Superficial vascular plexus

In the superficial and deep vascular plexus, pronounced changes in and failures of the vascular network can be observed.



Case study 5: Macular telangiectasia

OCT-A detailed analysis



Overview

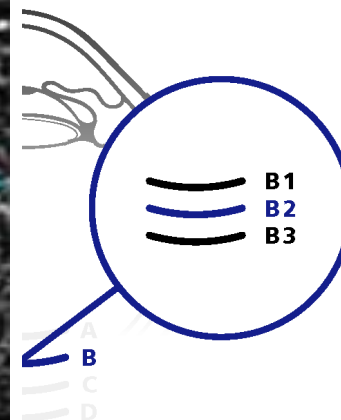
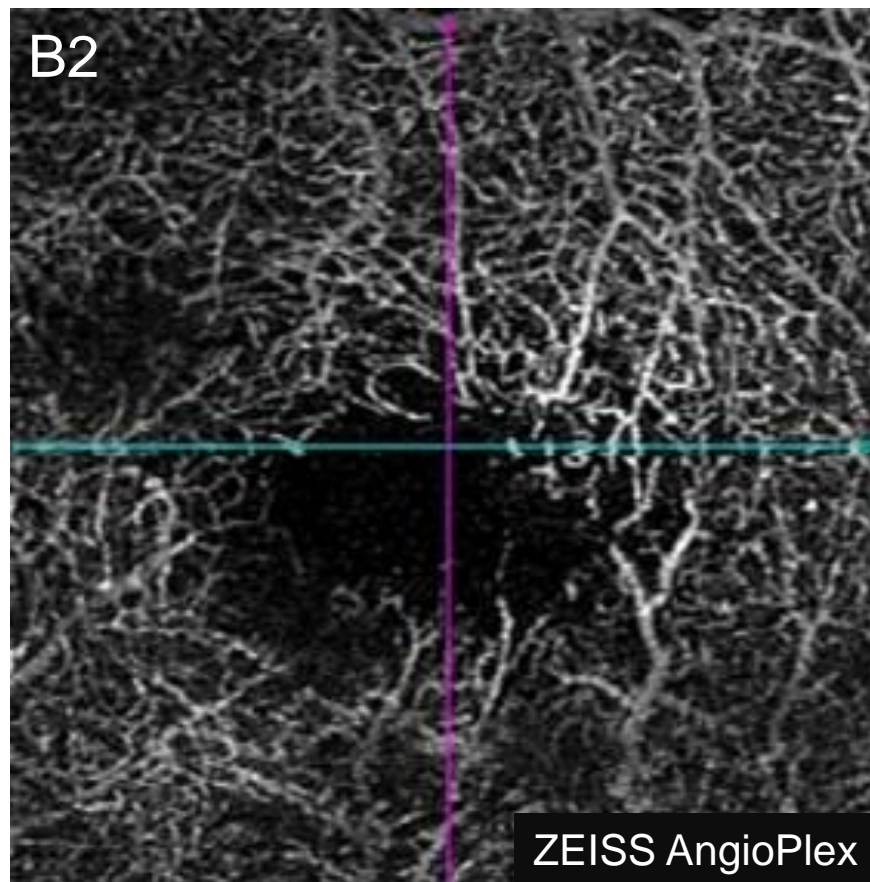
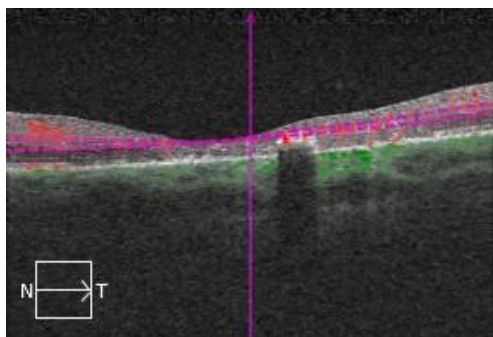


Content



Deep vascular plexus

In the superficial and deep vascular plexus, pronounced changes in and failures of the vascular network can be observed.



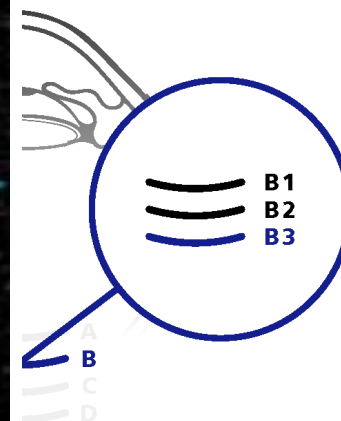
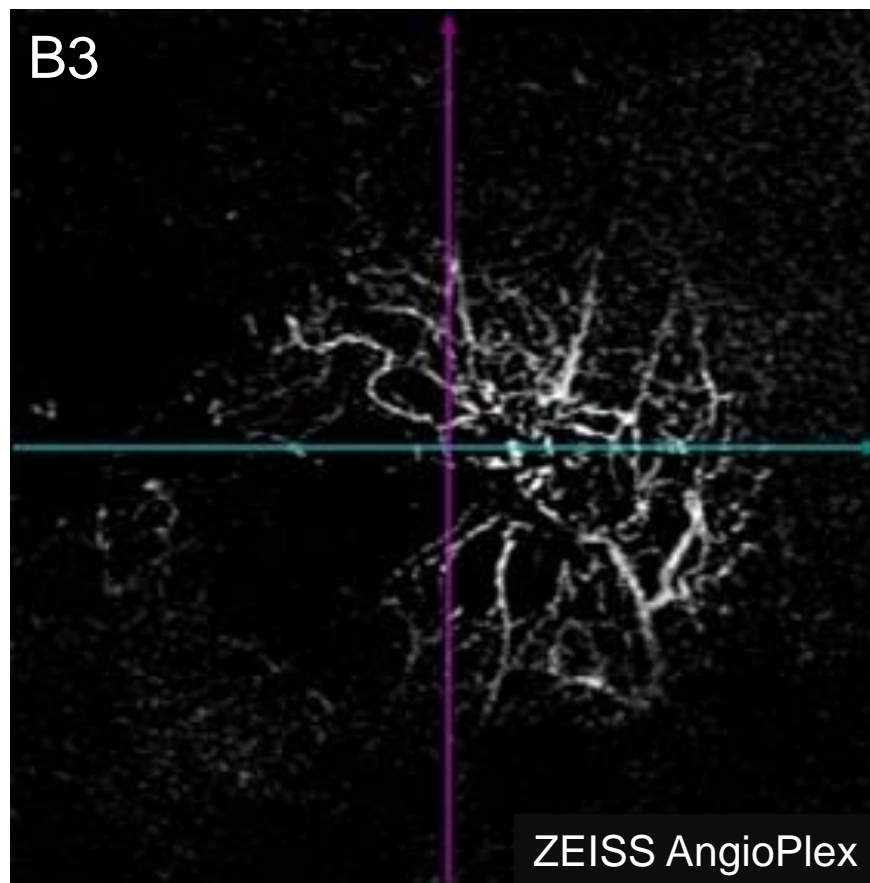
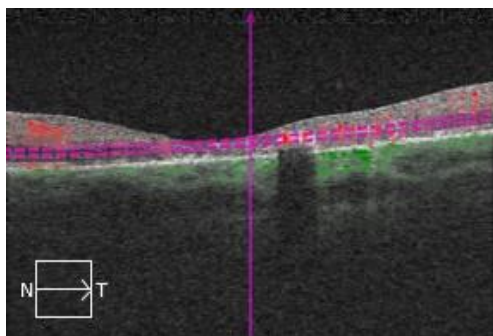
Case study 5: Macular telangiectasia

OCT-A detailed analysis



Avascular zone

The structures visible in the avascular zone probably represent projection effects of superficial vascular networks of the pigment epithelium displaced in this slice.

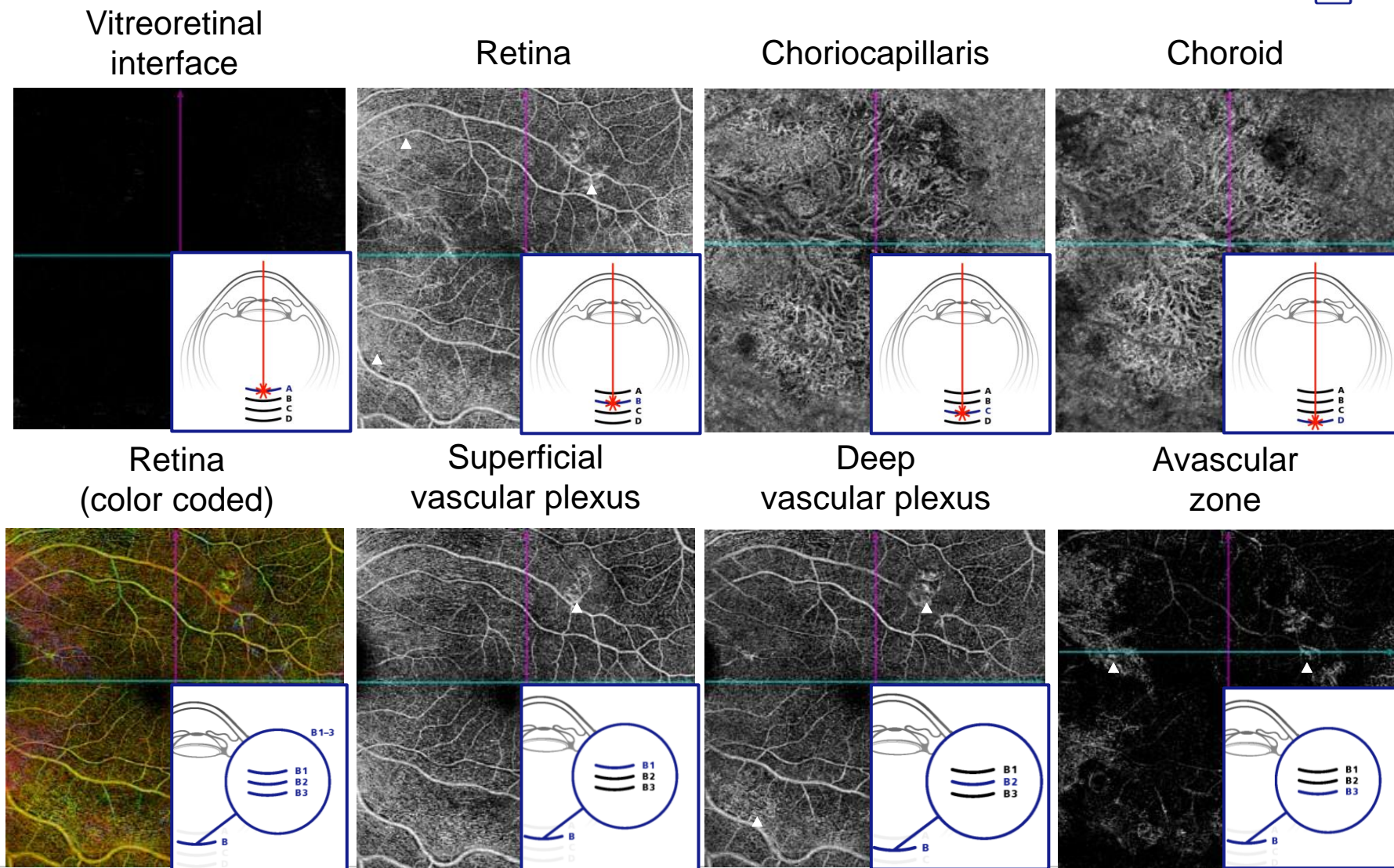


Case study 6: Choroidal neovascularization

Overview



Content



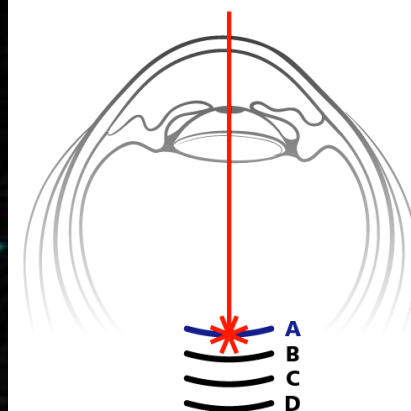
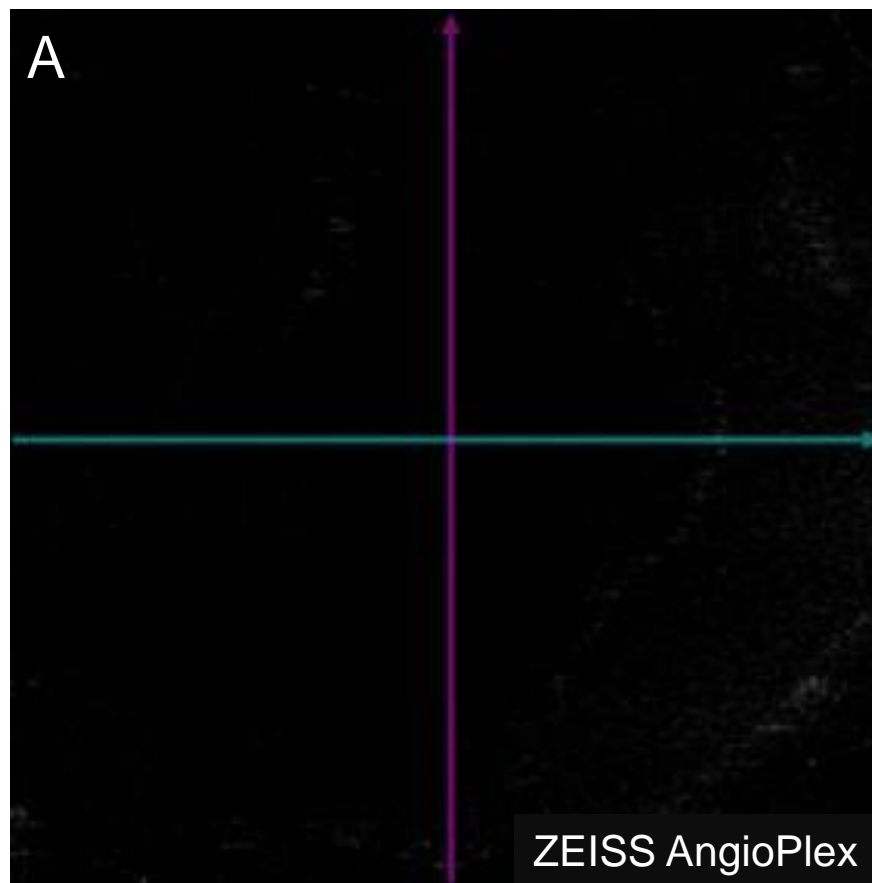
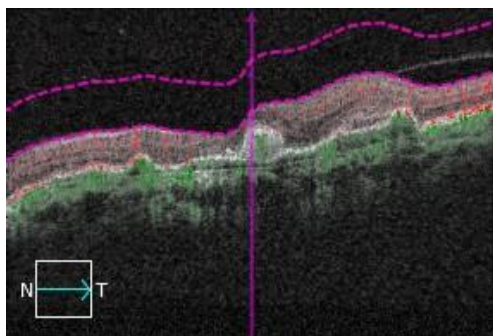
Case study 6: Choroidal neovascularization

OCT-A overview



Vitreoretinal interface

In the area of the vitreous body interface, no abnormal structures can be observed.



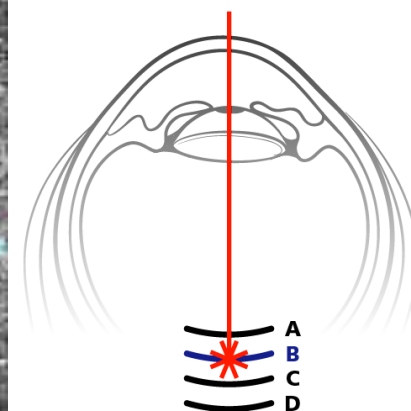
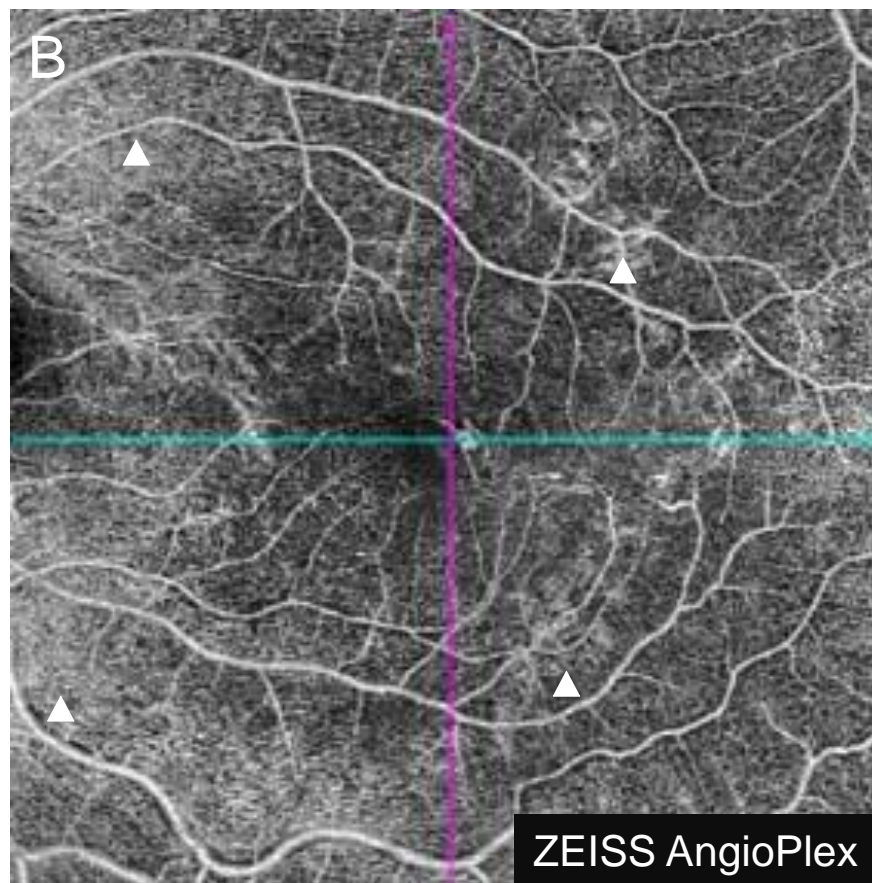
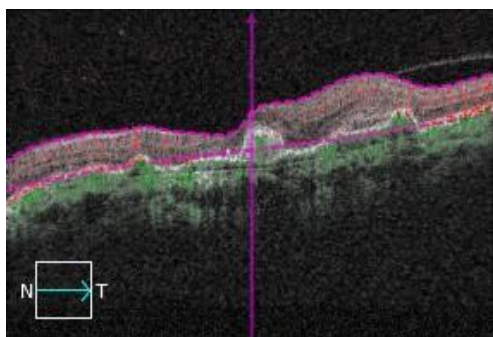
Case study 6: Choroidal neovascularization

OCT-A overview



Retina

Focal, unclearly demarcated areas of increased signal intensity appear. In the upper and lower hemisphere, diffuse patterns of increased signal intensity also can be detected.

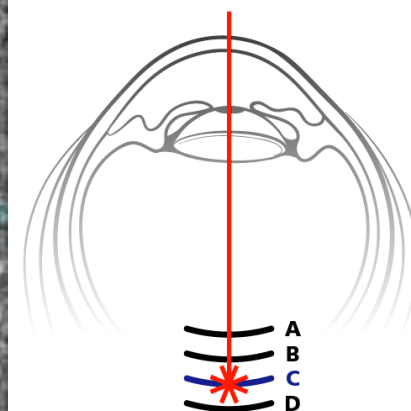
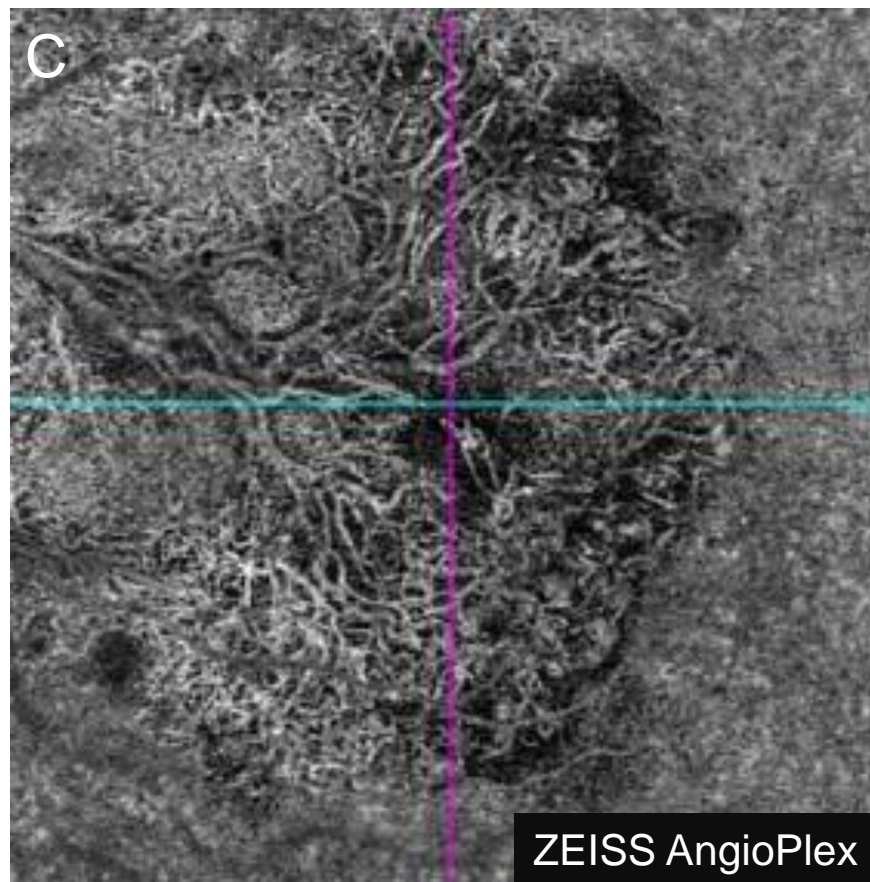
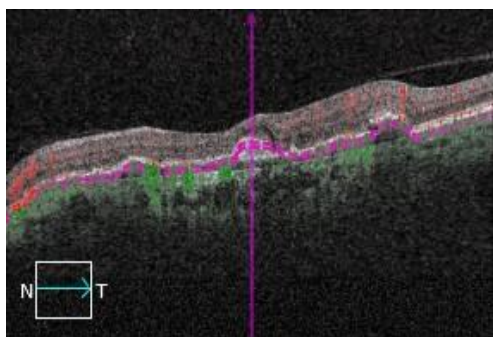


Case study 6: Choroidal neovascularization OCT-A overview



Choriocapillaris

In the area of the choriocapillaris, a clearly pronounced and tree-like vascular pattern of neovascularizations appears.



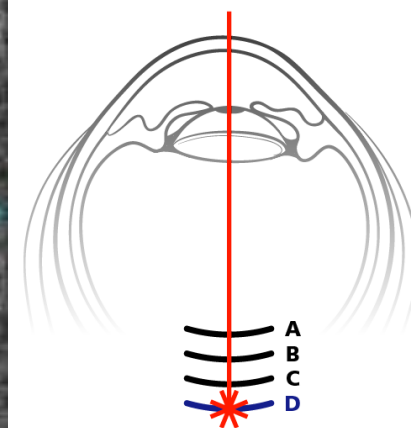
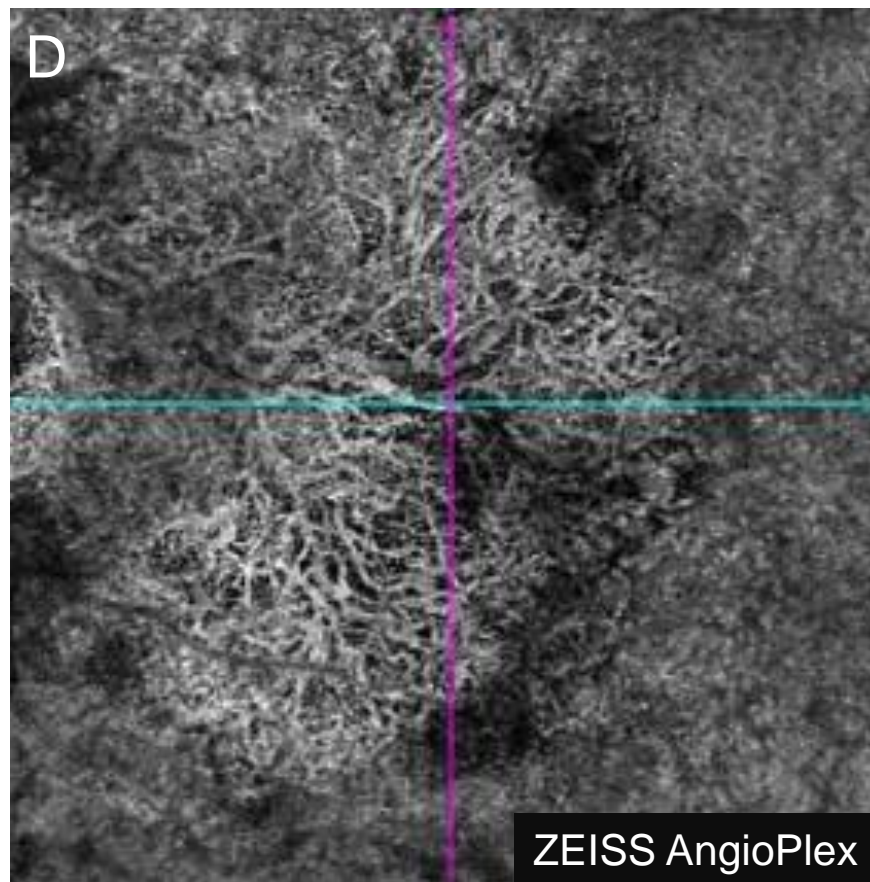
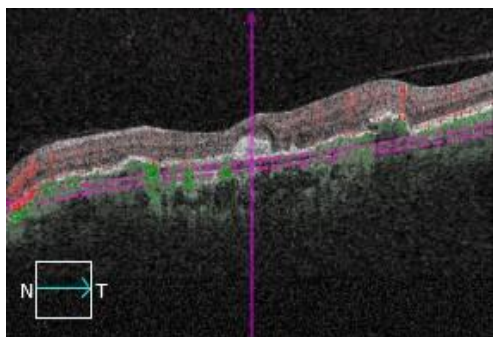
Case study 6: Choroidal neovascularization

OCT-A overview



Choroid

These also can be detected in the area of the choroid, however, not sharply separable from the associated projection artifacts. The hypointense areas here represent shadowings caused by the overlying detachment of the RPE.

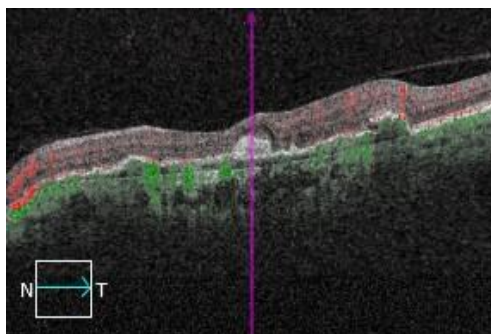
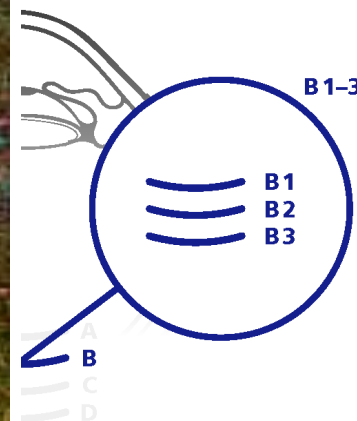
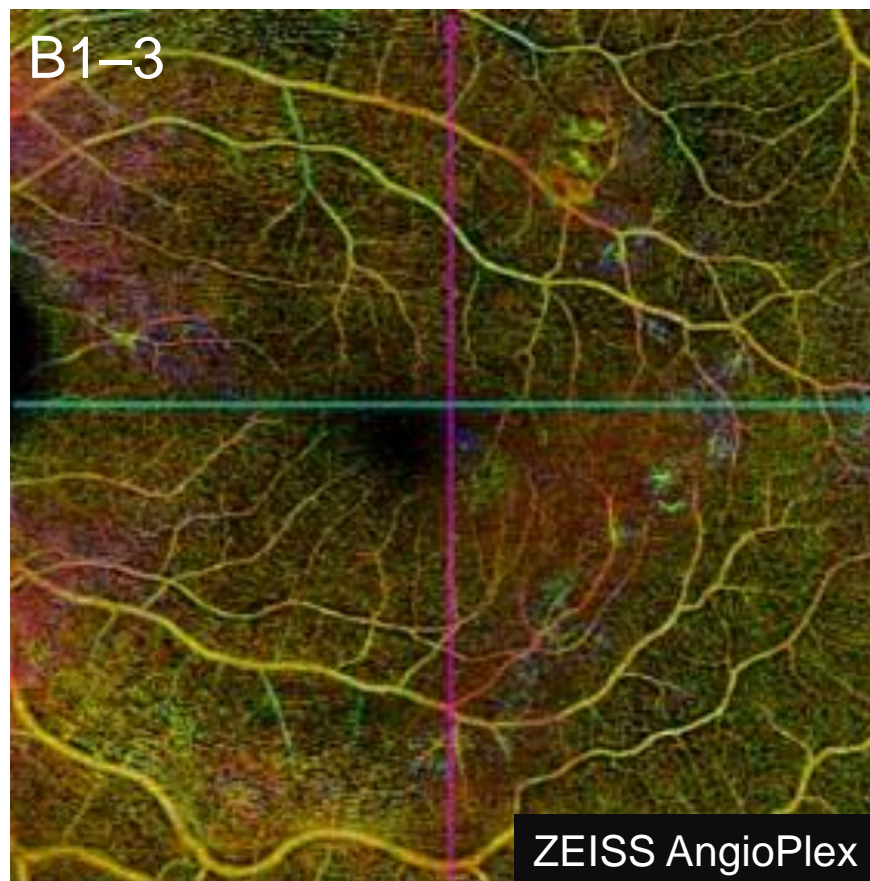


Case study 6: Choroidal neovascularization OCT-A detailed analysis



Retina (color coded)

In the color coded retinal depth, the abnormal focal areas and the diffuse areas appear nasally in blue color coding.



Case study 6: Choroidal neovascularization

OCT-A detailed analysis



Overview

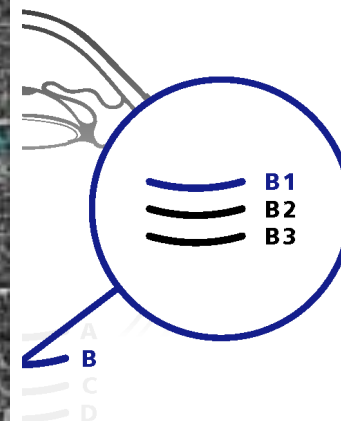
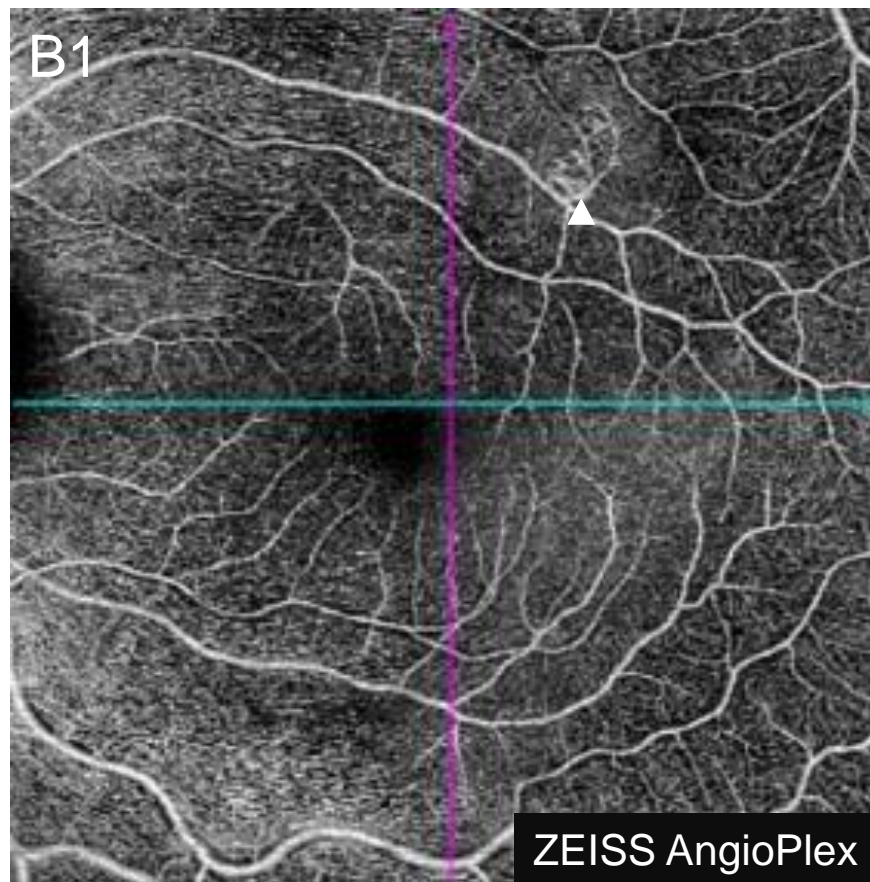
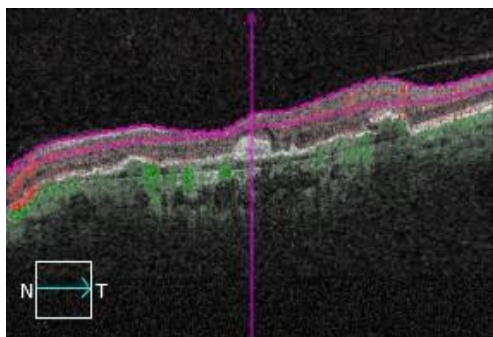


Content



Superficial vascular plexus

An abnormal focal area can be seen in the representation of the superficial vascular plexus (see arrow).



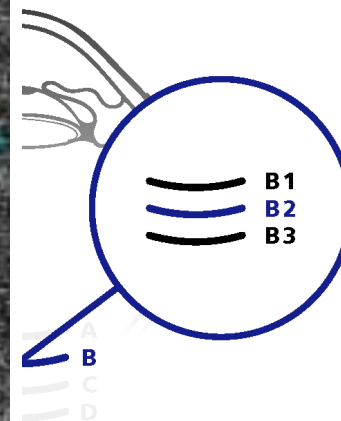
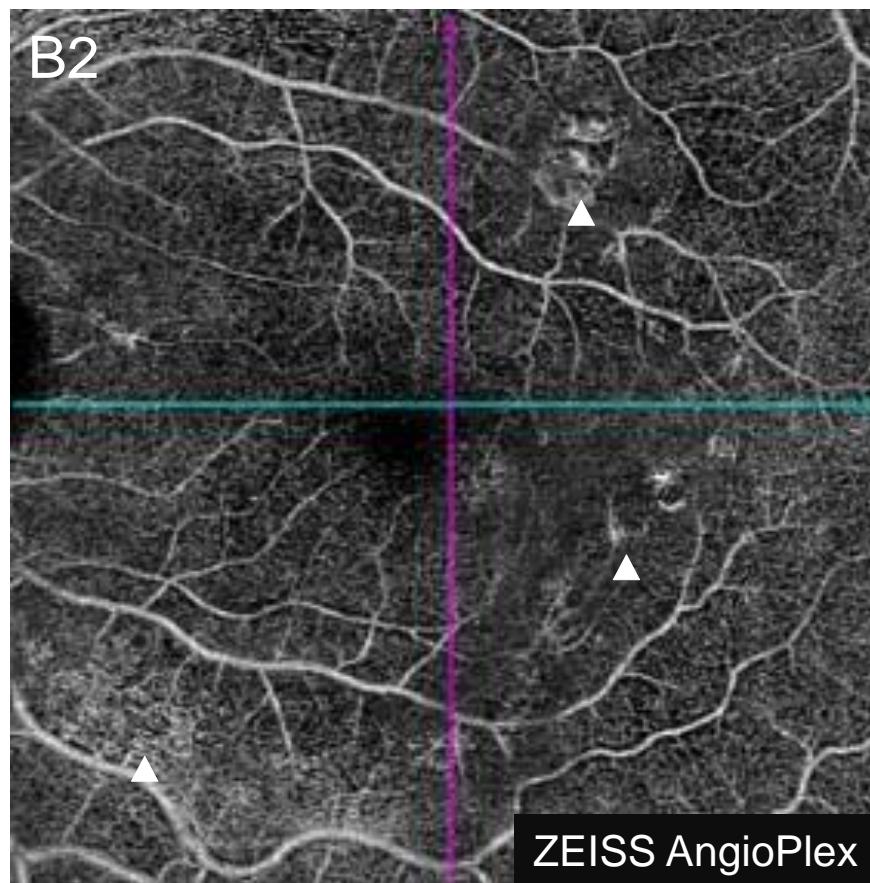
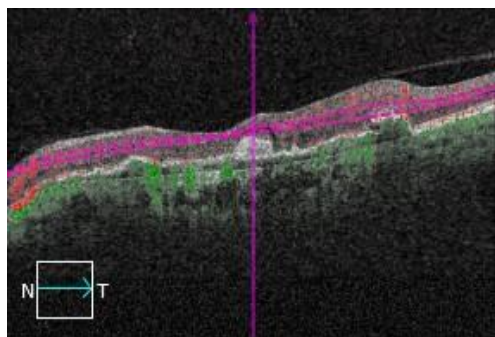
Case study 6: Choroidal neovascularization

OCT-A detailed analysis



Deep vascular plexus

The abnormal focal areas and the diffuse areas can be detected in the representation of the deep vascular plexus (see arrows).



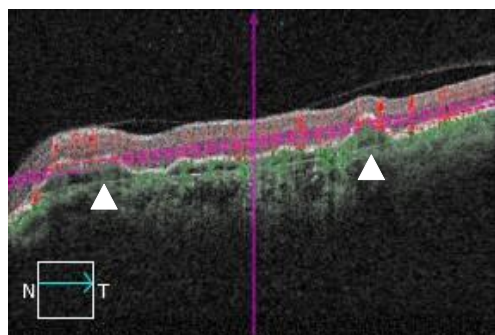
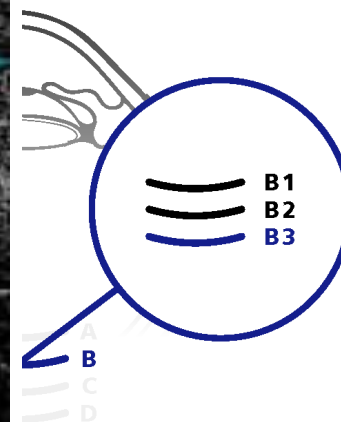
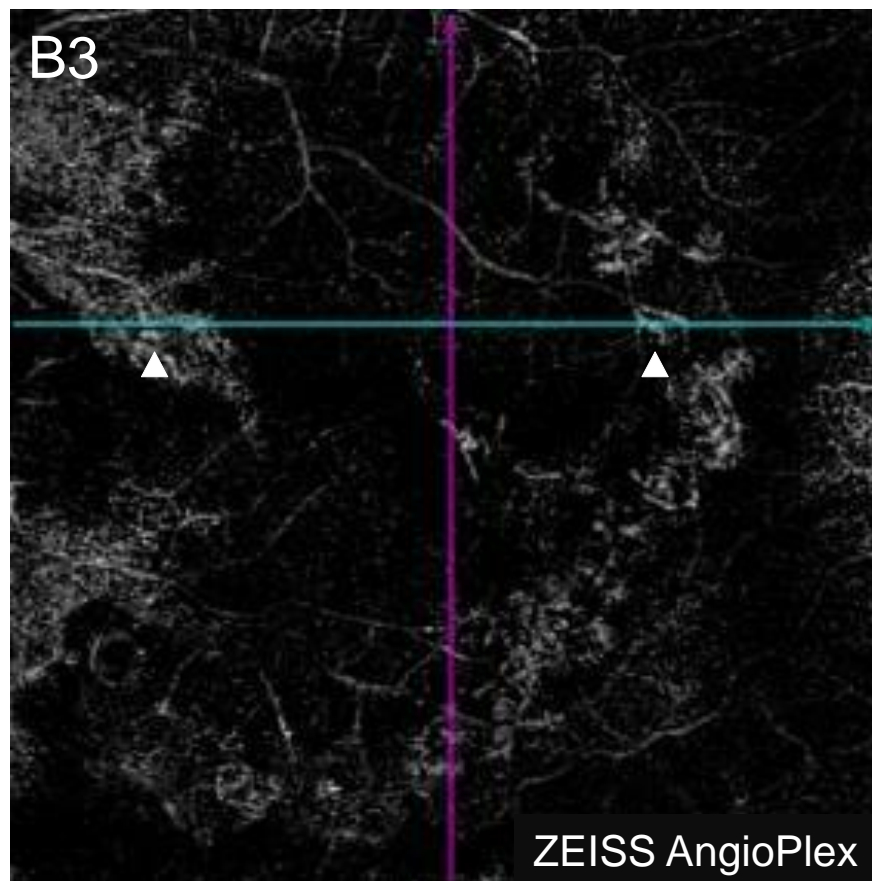
Case study 6: Choroidal neovascularization

OCT-A detailed analysis

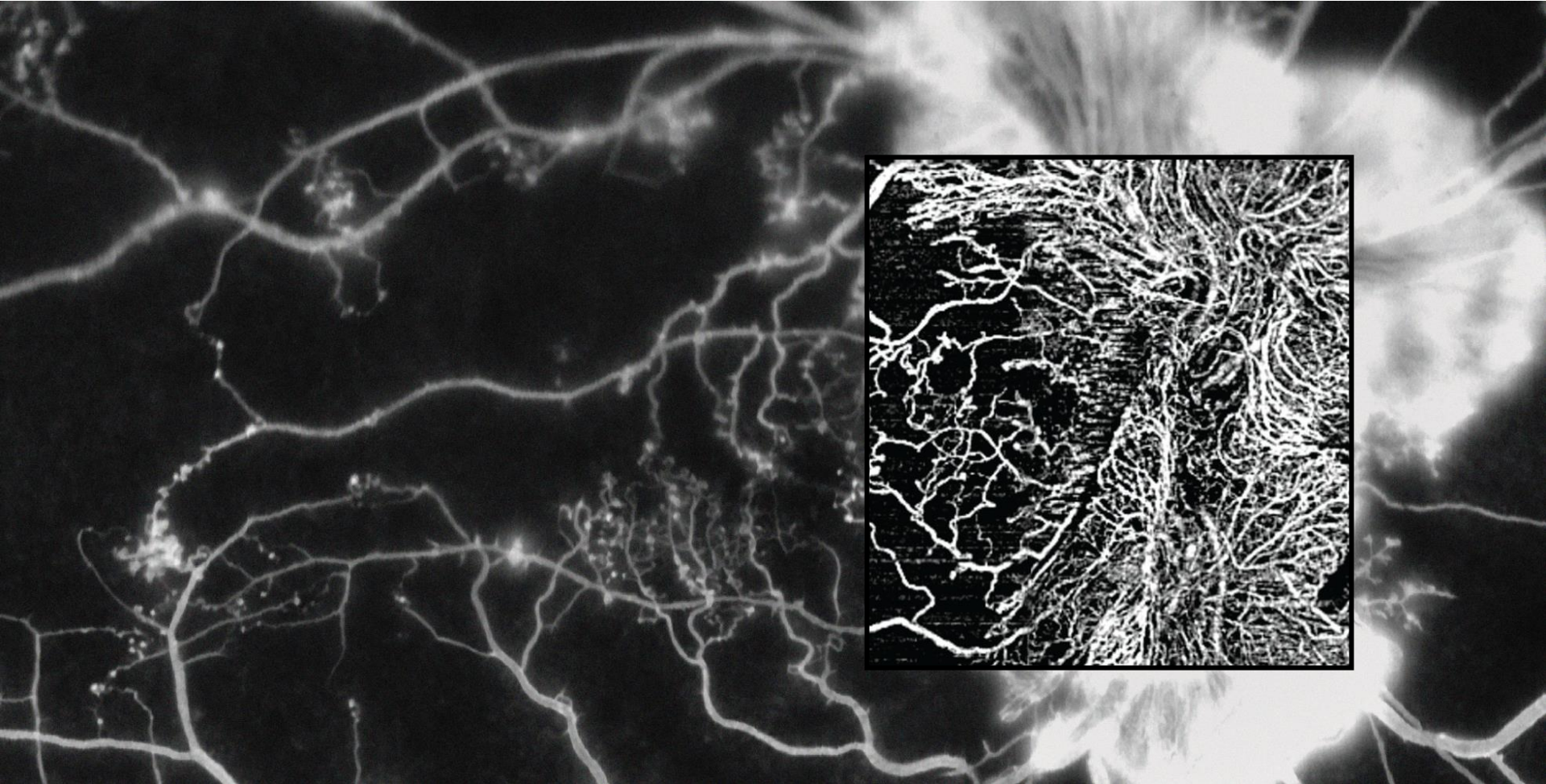


Avascular zone

At this location, the OCT shows a detachment of the retinal pigment epithelium in the area of the avascular zone. This involves mainly projection artifacts of overlying vascular layers here.



Thank you.



Browse through our collection of doctor experiences on our dedicated OCT Angiography portal, ZEISS OCT Access on EyeTube <https://eyetube.net/collection/zeiss-clinical>