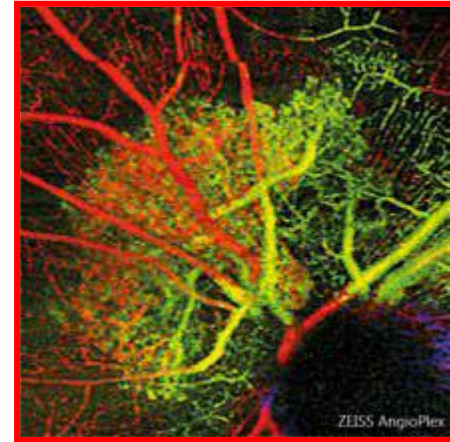
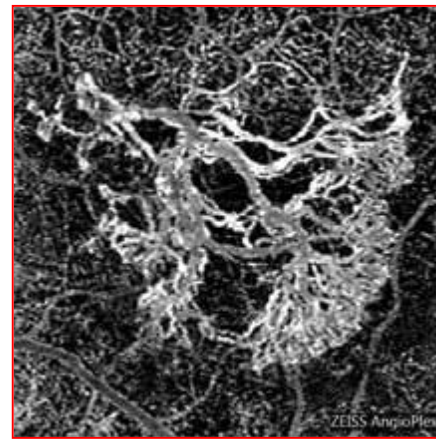
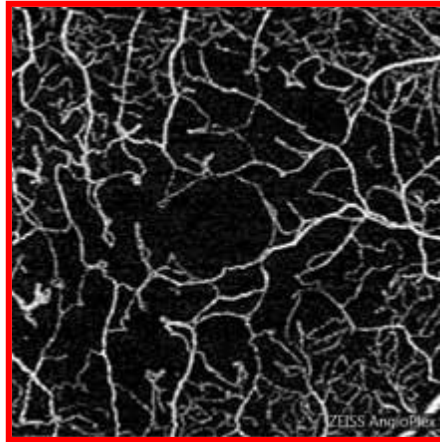
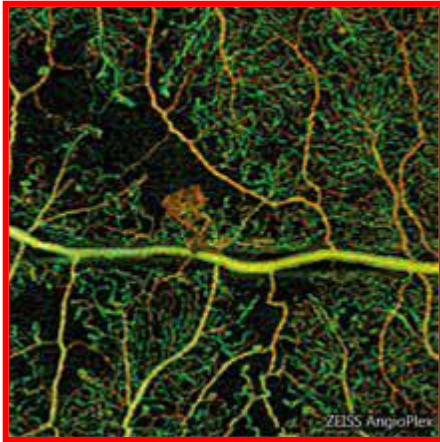

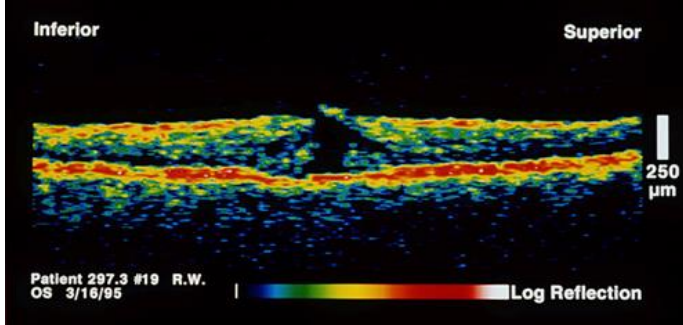

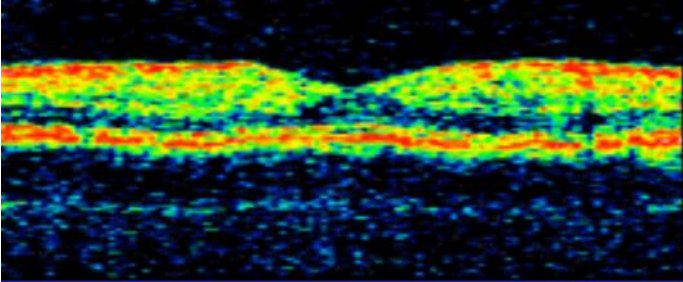

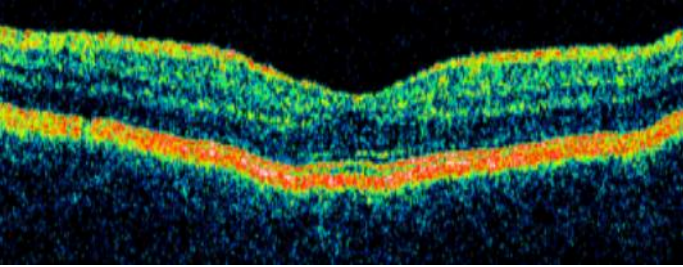

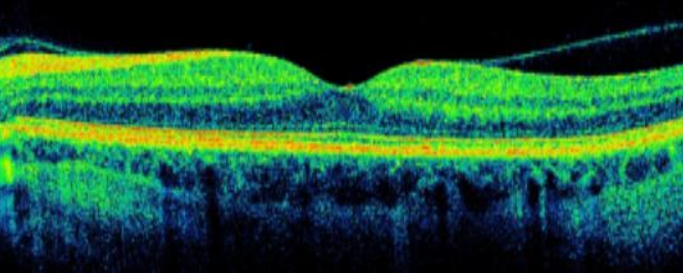


Corso Zeiss Angio-OCT

Dawn of a New Era in Imaging



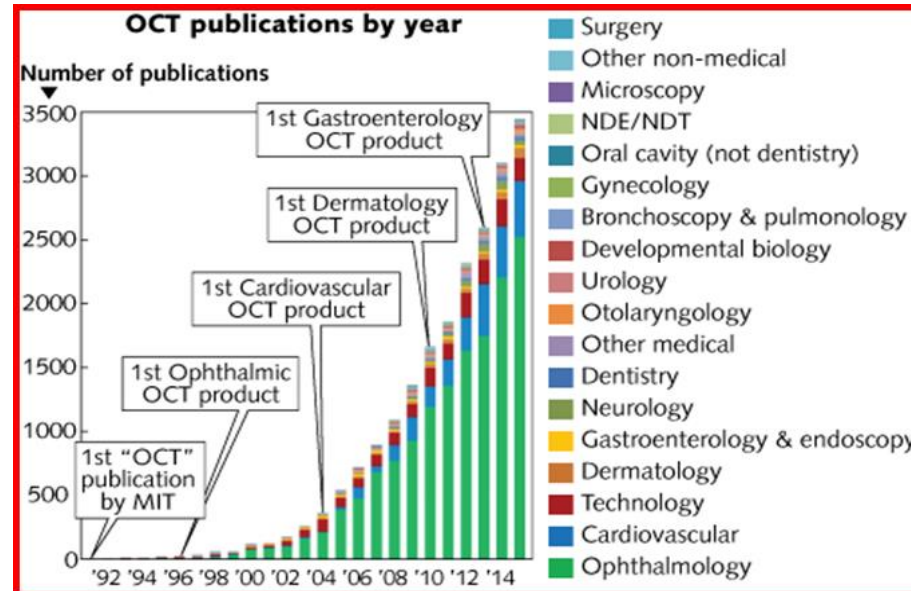
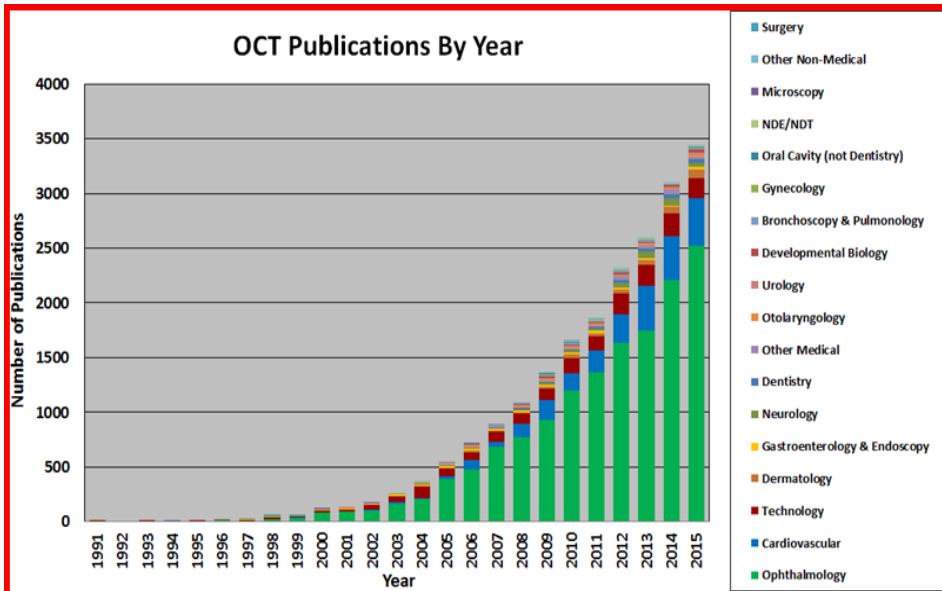
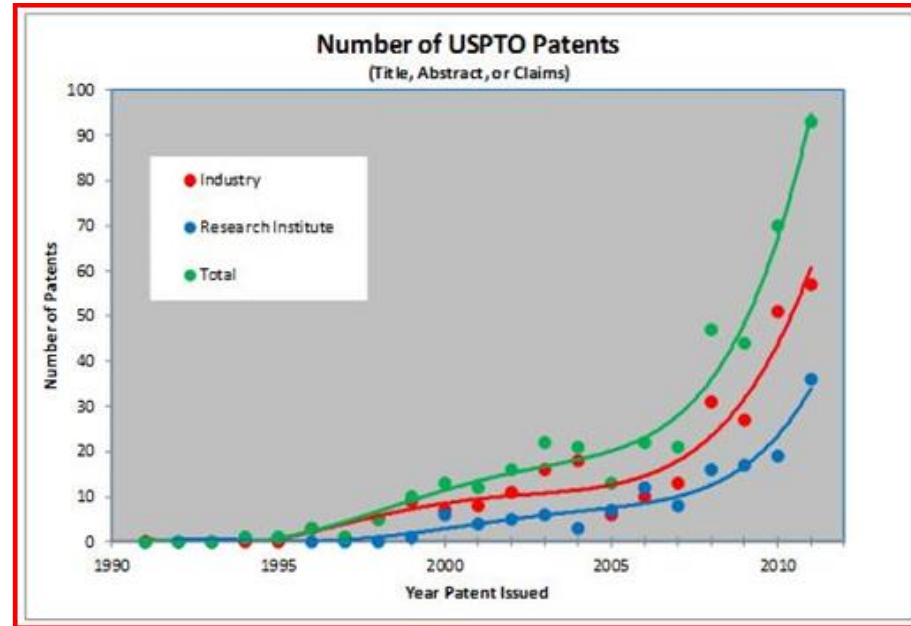
www.amedeolucente.it

Model Image	Year	Single line Scan	Scans Sec	Resolution (microns)	B Scan
	OCT 1995	100 A-scans x 500 points	100	20	
	OCT2 2000	100 A-scans x 500 points	100	20	
	OCT3 Stratus 2002	512 A-scans x1024 points	500	10	
	Cirrus HD-OCT 2007	4096 A-scans x 1024 points	27,000	5	

Foreword: 25 Years of Optical Coherence Tomography

by: James Fujimoto and David Huang

The market is just over \$1B in 2012, and it is expected to grow by 18–30% per year for the foreseeable future



Optical Coherence Tomography Angiography – A General View

Burak Turgut

Department of Ophthalmology, Faculty of Medicine, Firat University, Elazig, Turkey

DOI: <http://doi.org/10.17925/EOR.2016.10.01.39>

Table 1: The comparison of the specifications of main OCTA systems

AngioPlex*	AngioVue*	Spectralis OCTA [‡]	SS OCT Angio [†]	AngioScan [§]	Angio eXpert [¶]
<ul style="list-style-type: none"> Commercially available OMAG algorithm Used a light source of 840 nm and a bandwidth of 90 nm OCTA mean scan time: 3.8 seconds Real-time FastTrackeye tracking system Allowing visualisation of both the retinal flow and structure 3x3 mm and 6x6 mm OCT angiograms (in 2016 planning 8x8 mm and 12x12 mm) Segmentation algorithms including the maps of the superficial retina, the deep retina, avascular retina choriocapillaris and choroid 68,000 A-scans/sec OCTA requires 1 scan Motion correction software to remove artifacts En-face microvascular flow images en-face map of the retinal and choroidal blood flow 	<ul style="list-style-type: none"> Commercially available SSADA algorithm Used a light source of 840 nm and a bandwidth of 45 nm OCTA mean scan time: 3 seconds Allowing visualisation of both the retinal flow and structure 3x3 mm 4.5x4.5 mm, 6x6 mm and 8x8 mm OCT angiograms Segmentation algorithms including plexus of the superficial retinal capillary plexus, the deep retinal capillary plexus, the choriocapillaris 70,000 A-scans/sec OCTA requires 2 separate scans No eye tracking system Motion Correction Technology software to remove artifacts Angio quantification with AngioAnalytics quantification En-face map of the retinal and choroidal blood flow 	<ul style="list-style-type: none"> Not available in all countries Amplitude decorrelation algorithm Used a light source of 870 nm with bandwidth of 50 nm An automated, realtime mode and an Active Eye Tracking System Expect a long acquisition time (1-2 minutes per eye) 85,000 A-scans/sec with upgrading to new OCT2 module Expect a good image quality Basic software interface, not yet refined No detailed information on segmentation capability No detailed data on device specifications and software 	<ul style="list-style-type: none"> Not available in all countries Swept Source OCT OCTARA algorithm Used a light source of 1,050 nm 100,000 A scan/sec Scan size (mm) 3.0x3.0 mm, 4.5x4.5 mm, 6.0x6.0 mm SMARTTrack tracking software Multi-modal SS-OCT/fundus camera with OCT Angiography Expect a wide field, deep penetration Segmentation algorithms including superficial, deep, outer retina and choriocapillaris No active motion correction software 	<ul style="list-style-type: none"> Not available in all countries Modified OMAG algorithm (motion detection and decorrelation analysis) Used a light source of 880 nm 3x3 mm, 6x6 mm, 9x9 mm scans plus 12x9 mm montage (12 3x3 mm scans) widest field of view 53,000 A-scans/sec Long scan time (40 sec+) Real-time SLO based tracking system Multiple scan patterns Montage ability for panoramic image Segmentation algorithms including superficial, deep, outer retina and choriocapillaris The visualisation of the retinal and choroidal blood flow 	<ul style="list-style-type: none"> Not available in all countries No data in web about the used OCTA algorithm Used a light source of 855 nm ± 5 nm Segmentation algorithms including superficial, deep, outer retina and choriocapillaris 3x3 to 8x8 mm OCT angiograms OCTA mean scan time: appr. 3.0 seconds Maximum 70,000 A-scans/sec The superficial and deeper blood vessels a designated layer SLO tracking follow-up Auto fundus tracking by SLO No information on the visualisation of the retinal and choroidal blood flow No detailed data on device specifications and softwares

Data on all OCTA devices and systems have been provided from the catalogues, manuals and web pages. * Zeiss, †OcuVue, ‡Heidelberg, §Topcon, ¶Nidek, ¶Canon. OCT = optical coherence tomography; OCTA = optical coherence tomography angiography; OCTARA = OCT angiography Ratio Analysis; OMAG = optical microangiography; SLO = scanning laser ophthalmoscope; SS = swept-source; SSADA = split-spectrum amplitude decorrelation angiography.



=

- 55,9% Zeiss **OCT**
 - 35,6% Heidelberg By Mark Hillen
 - 6,4% Topcon
 - 2,1% Nidek
- Benchmarking OCT.**
The Ophthalmologist,
February 2016

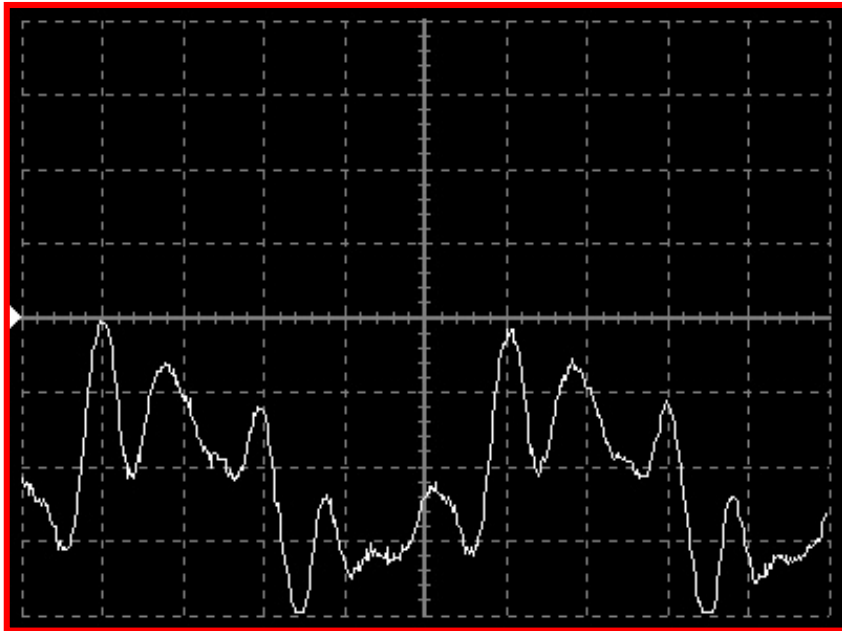
- **Optovue** → RTvue Avanti AngioVue
- **Zeiss** → AngioPlex Cirrus 5000
- **Topcon** → DRI OCT Triton
- **Heidelberg** → Spectralis con modulo OCT2
- **Nidek** → RS-3000 Advance OCT Angio-Scan
- **Canon** → OCT-HS100 Angio-eXpert con modulo AX (Gruppo Haag-Streit)

- **RTvue Avanti Optovue** **70.000** A-Scan/Sec → **SSADA**
(Split Spectrum Amplitude Decorrelation Angiography)
- **HD-Cirrus Zeiss** **68.000** A-Scan/Sec → **OMAGc**
(Optical Microangiography complex)
- **SS OCT DRI OCT Topcon** **100.000** A-Scan/Sec → **OCTARA**
(OCT Angiography Ratio Analysis)
- **Spectralis Heidelberg** **70.000** A-Scan/Sec → **Full SADA**
Spectrum Amplitude Decorrelation Algorithm

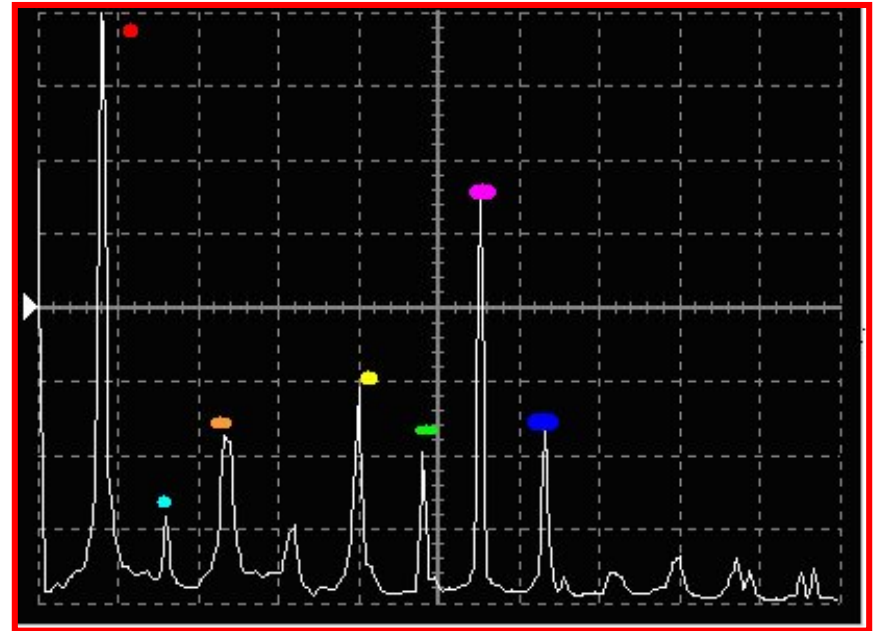
Una delle più belle e utili formule che siano mai state scritte, alla base del progresso tecnologico degli ultimi 200 anni!

$$X(f) = \int_{-\infty}^{+\infty} x(t) \cdot e^{-j 2\pi f t} dt$$
$$x(t) = \int_{-\infty}^{+\infty} X(f) \cdot e^{+j 2\pi f t} df$$

Trasformata e Antitrasformata di Fourier

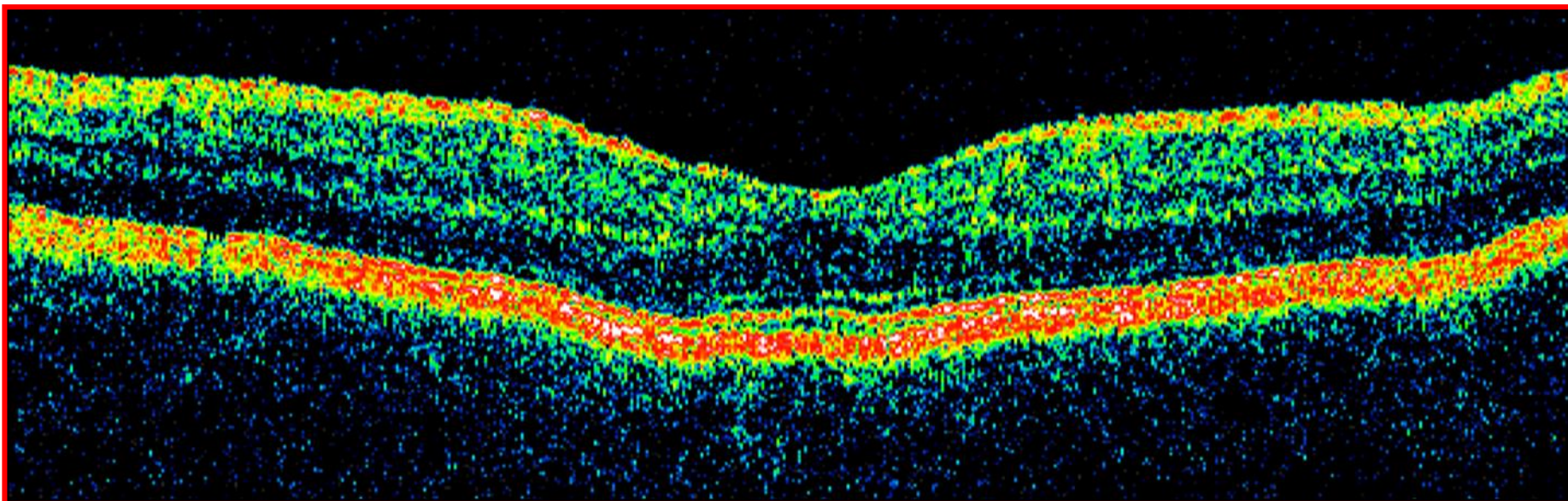


L'onda di 'La' del clarinetto che varia nel tempo viene registrata tramite oscilloscopio $x(t)$

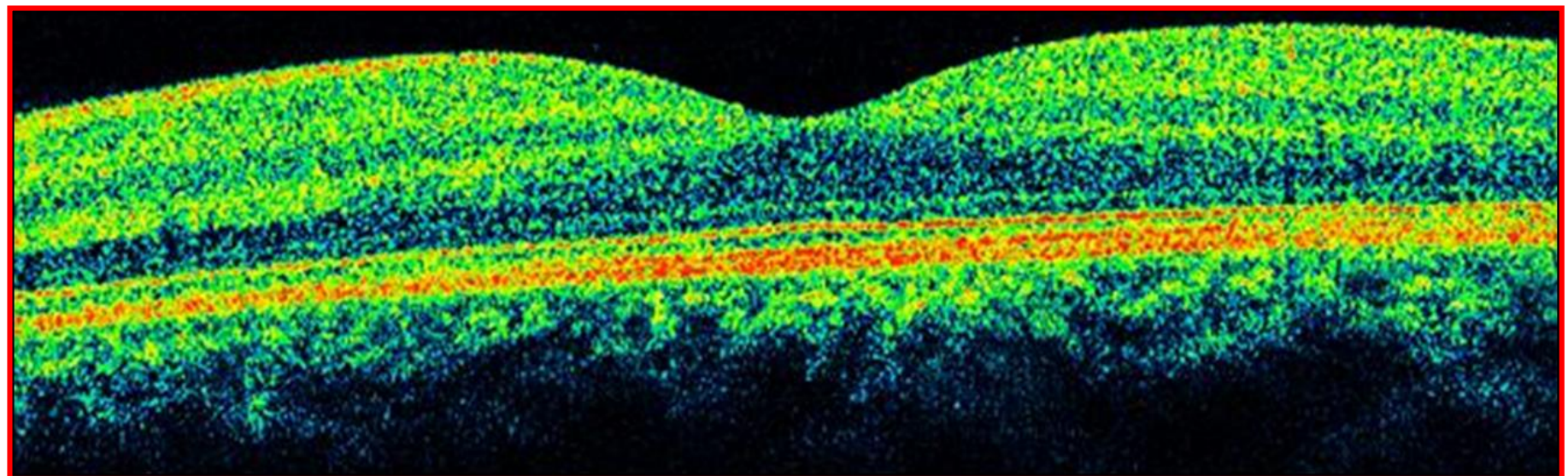


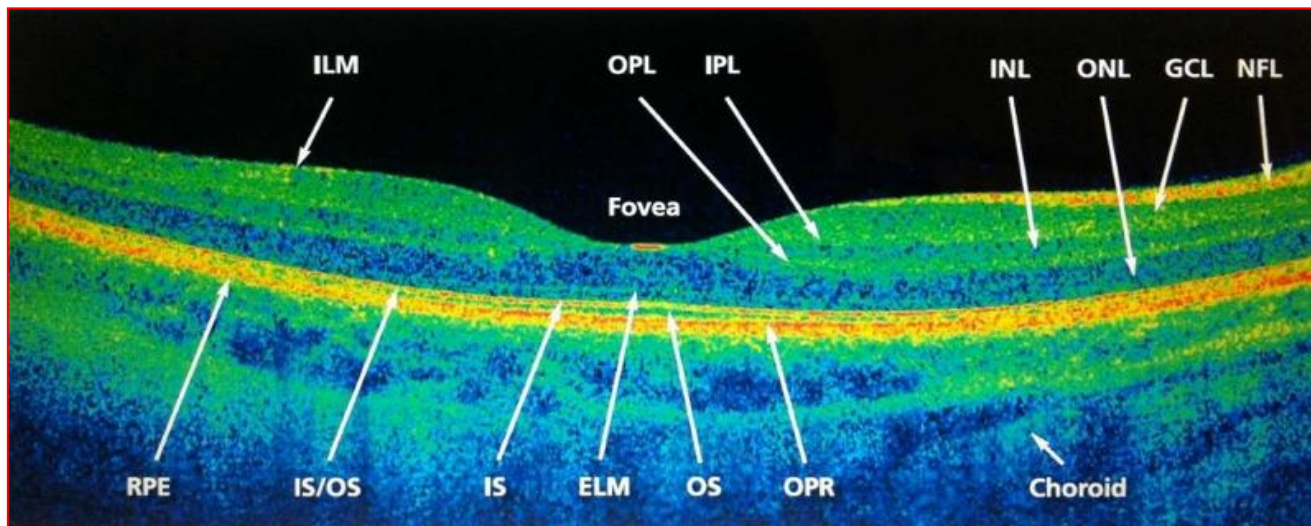
Il 'La' del clarinetto scomposta in sotto-onde nel dominio delle frequenze $X(f)$

$x(t)$

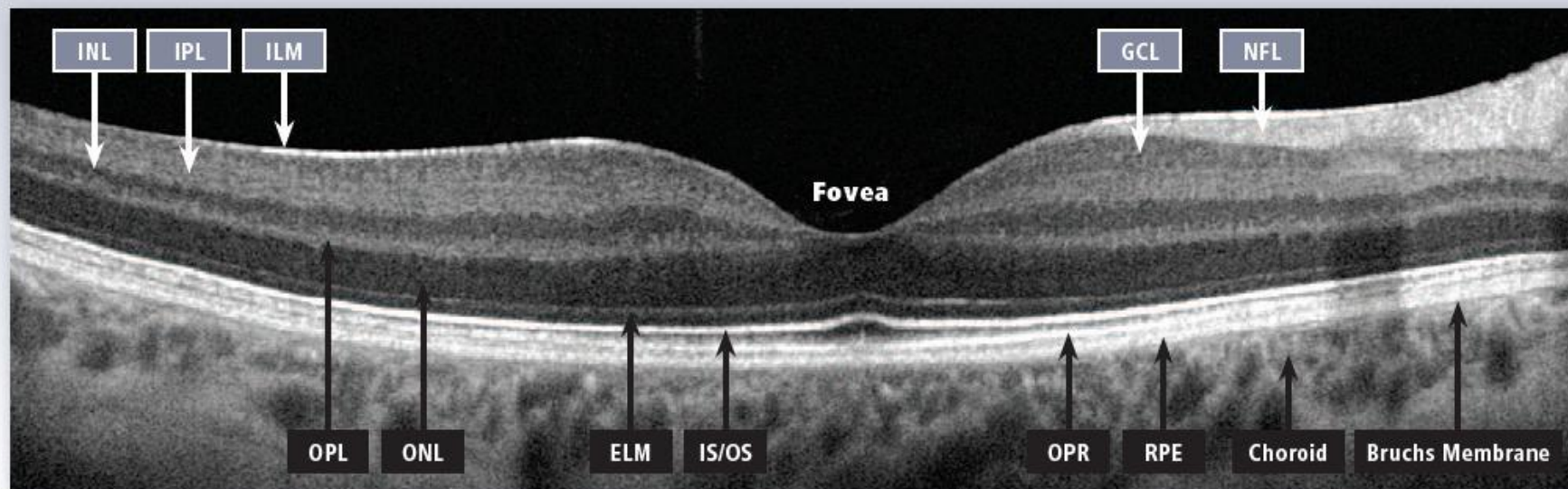


$x(f)$





Cirrus™ HD-OCT: interpretation of retinal layers

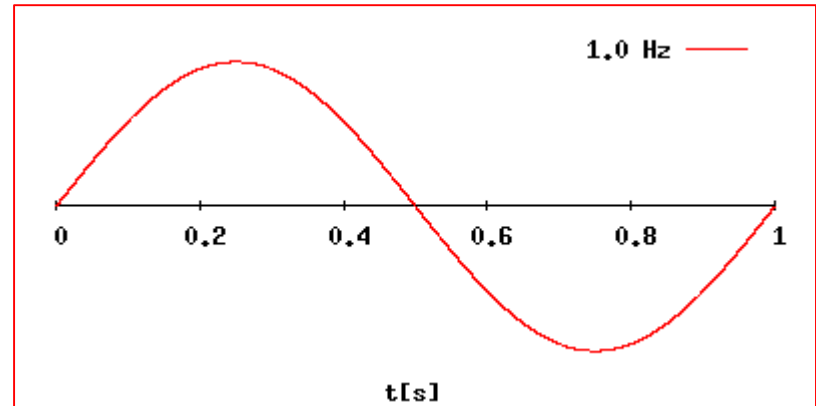
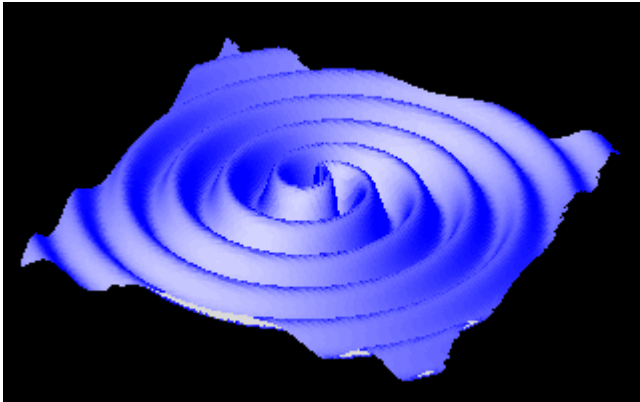
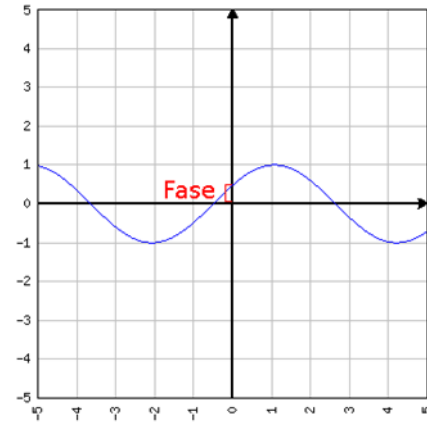
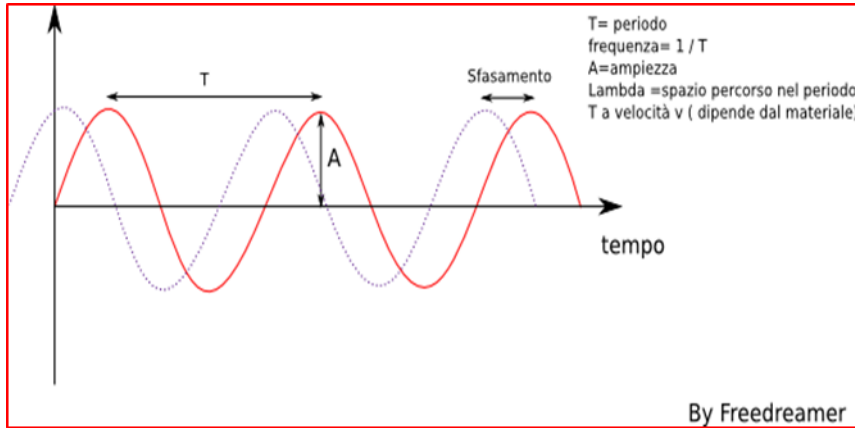


ILM: Inner limiting membrane
 IPL: Inner plexiform layer
 INL: Inner nuclear layer
 OPL: Outer plexiform layer
 ONL: Outer nuclear layer

ELM: External limiting membrane
 IS/OS: Junction of inner and outer
 photoreceptor segments
 OPR: Outer segment PR/RPE complex

NFL: Nerve fiber layer
 GCL: Ganglion cell layer
 RPE: Retinal pigment epithelium
 + Bruch's Membrane

What is a wave? «energy propagated through matter» A. Einstein

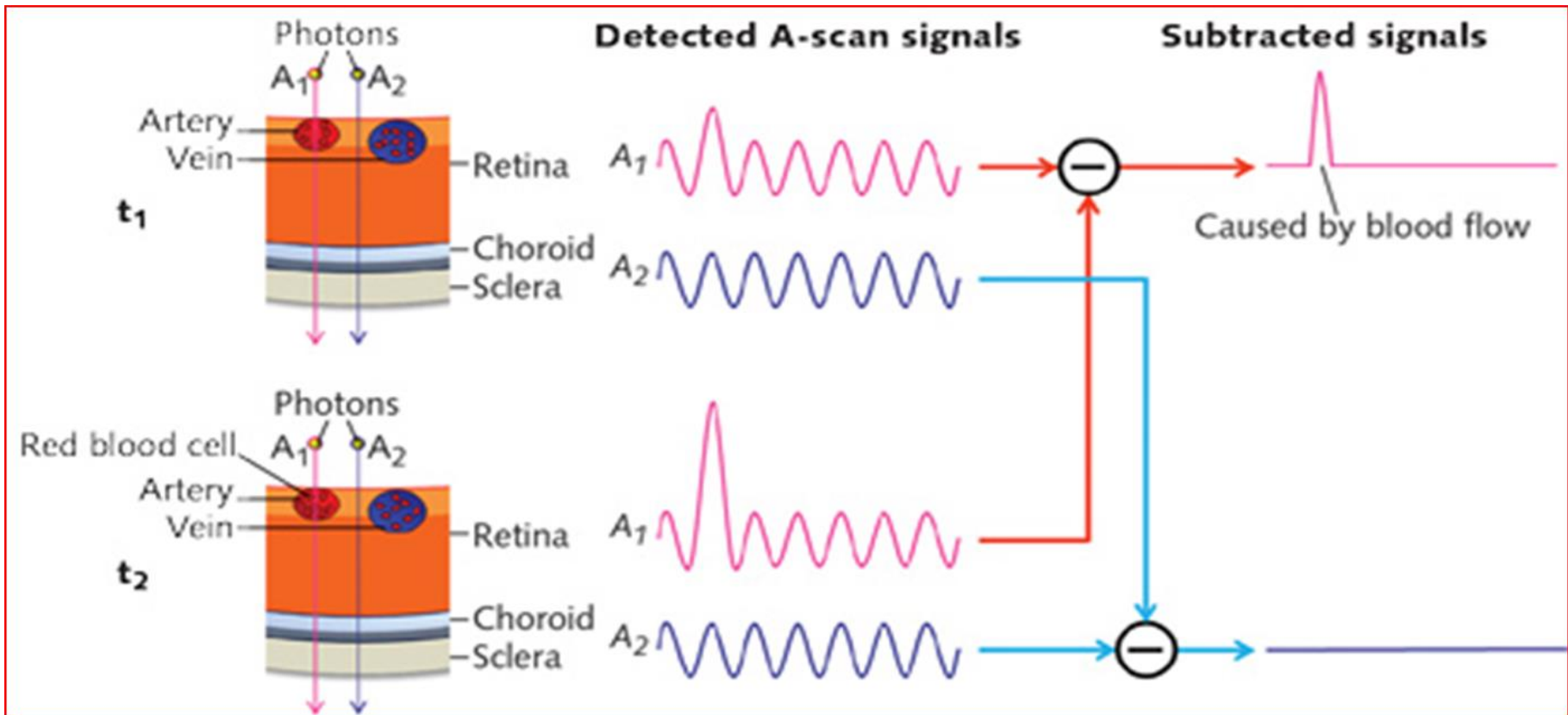


a) Angiografia dyeless basata sull'ampiezza del segnale OCT

b) Angiografia dyeless basata sulla fase del segnale OCT

c) Angiografia dyeless basata sull'ampiezza e sulla fase del segnale OCT
(complex signal)

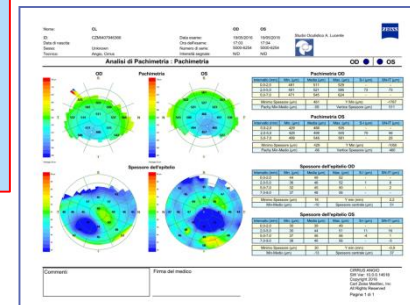
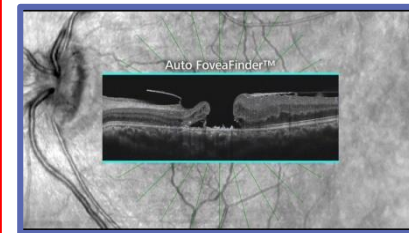
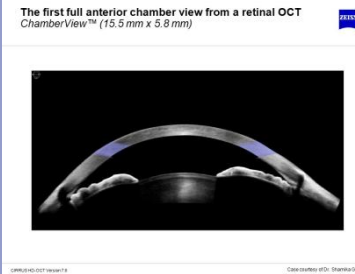
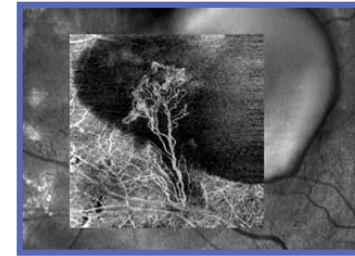
How OCTA Works



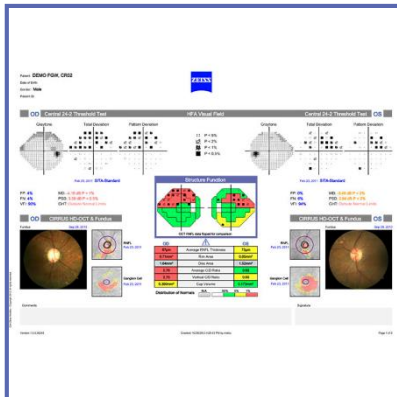
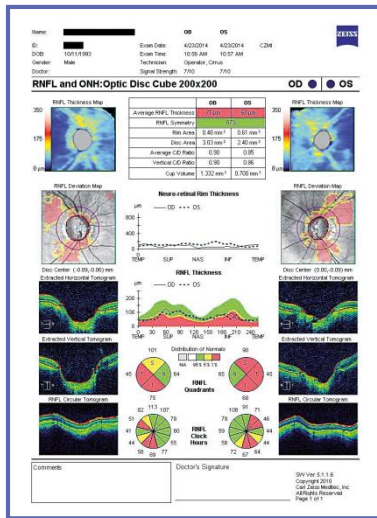
As moving blood cells pass through vessels, they generate changes in OCT signals. Based on this concept, a blood flow signal can be extracted by subtracting the OCT signals from the same location but at different time points (red path). The OCT signals will be different at these locations, while OCT signals from surrounding retinal tissues will remain steady (blue path).

by **CHIEH-LI CHEN 11/13/2015 Bio Optics World**

INDEX Angio Plex Cirrus



AngioPlex™ OCT
 Angiography En face
 Analysis Advanced RPE Analysis
 Macular Thickness Analysis
 Macular Change Analysis
 HD 1 line
 HD 21 Line
 RNFL and ONH Analysis
 ONH/RNFL Guided Progression Analysis™
 (GPA™)
 Ganglion Cell Analysis
 GCA Guided Progression Analysis (GPA)
 PanoMap™ Analysis
 Anterior Chamber Analysis
 Wide Angle-to-Angle
 Analysis Pachymetry (epithelial and stromal thickness maps)
 Analysis HD Cornea
 HD Angle
 HFA-CIRRUS Structure-Function Report



Perfusion Density/Flow Index and Vessel Density

$$\text{Perfusion Density} = \frac{\text{Area Perfusa [mm}^2\text{]}}{\text{Area Totale [mm}^2\text{]}}$$

$$\text{Vessel Density [mm}^{-1}\text{]} = \frac{\text{Lunghezza Vasi [mm]}}{\text{Area Totale [mm}^2\text{]}}$$

The flow index is defined as the average decorrelation values in the segmented area

The VD was defined as the percentage of signal-positive pixels/area of interest

The Vessel Density is defined as the percentage area occupied by vessels the segmented area

$$\frac{\int_A D \cdot V dA}{\int_A dA} \quad \text{If not} \\ (V=1, \text{ if vessel; } V=0,$$

$$\frac{\int_A V dA}{\int_A dA} \quad \text{If not} \\ (V=1, \text{ if vessel; } V=0,$$

Numero di pubblicazione WO2014040070 A1

Tipo di pubblicazione Richiesta

Numero domanda PCT/US2013/059047

Data di pubblicazione 13 mar 2014

Data di registrazione 10 set 2013

Data di priorità 10 set 2012

Pubblicato anche come CA2883402A1, Altri 5 »

Inventori David Huang, Yali Jia, Jason Tokayer, Ou Tan

Candidato Oregon Health & Science University

Esporta citazione BiBTeX, EndNote, RefMan

Citazioni di brevetti (5), Con riferimenti in (1), Classificazioni (15), Eventi legali (4)

AngioPlex Metrix™ for HD-Cirrus 5000

- **Density measure (ETDRS, central, inner, full)**

densità dei vasi/Vessel Density

densità di perfusione/Flow Index

- **FAZ Parameters**

Area mm²

Perimetro (mm),

Circolarità della FAZ

- **Angiography Change**

Vessel Density

Flow Index

FAZ

AngioPlex Matrix: Angiography Analysis/Change Screen

AngioPlex Matrix

Density Measure

Vessel | Perfusion

Overlays

Map | Trace | FAZ

Transparency (%) 50

ETDRS

Show Grid

Show Values

Region	Density
Central	9.8
Inner	17.6
Full	16.7

FAZ

Edit

Area	0.26 mm ²
Perimeter	2.63 mm
Circularity	0.46

Slab: Top: ILM 0 Bottom: IPL 0

ETDRS

- Show Grid
- Show Values

Region	Exam 1	Exam 2	Difference
Central	8.0	9.8	1.8 (23%)
Inner	16.8	17.6	0.8 (5%)
Full	15.8	16.7	0.9 (6%)

AngioMetrics

Density Measure

Vessel | Perfusion

Overlays

Map | Trace | FAZ

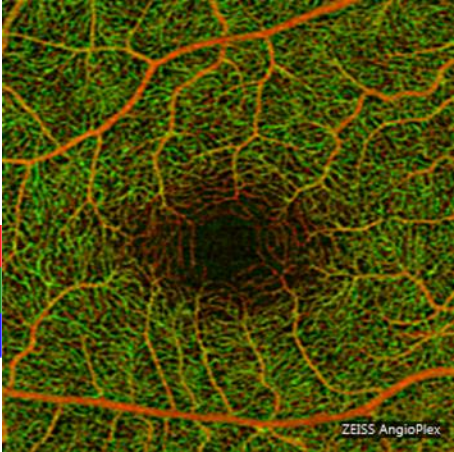

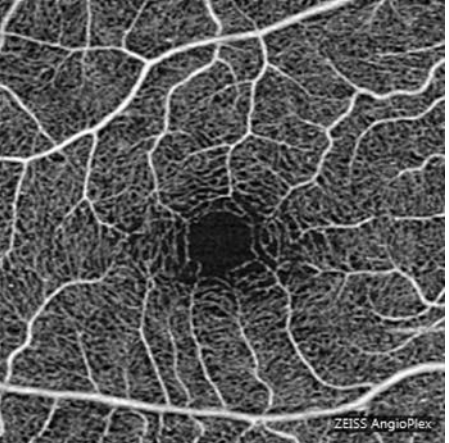
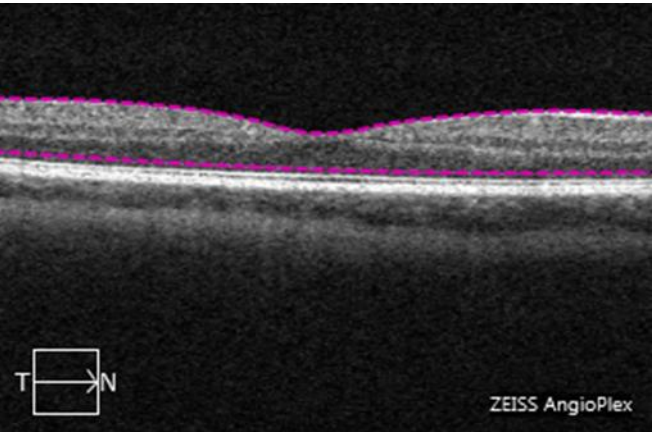
Transparency (%) 50

Slab: Top: ILM 0 Bottom: IPL 0

FAZ

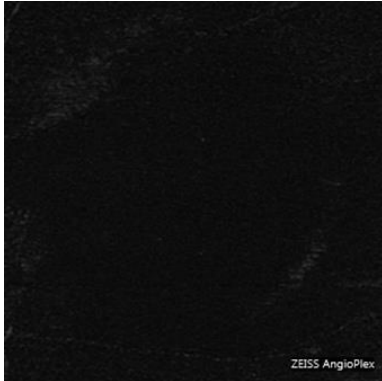
	Exam 1	Exam 2	Difference
Area	0.24 mm ²	0.26 mm ²	0.02 mm ² (8%)
Perimeter	2.18 mm	2.63 mm	0.45 mm (21%)
Circularity	0.64	0.46	-0.18 (-28%)

AngioPlex Analysis Layer Presets: Retina Depth Encoded and Retina

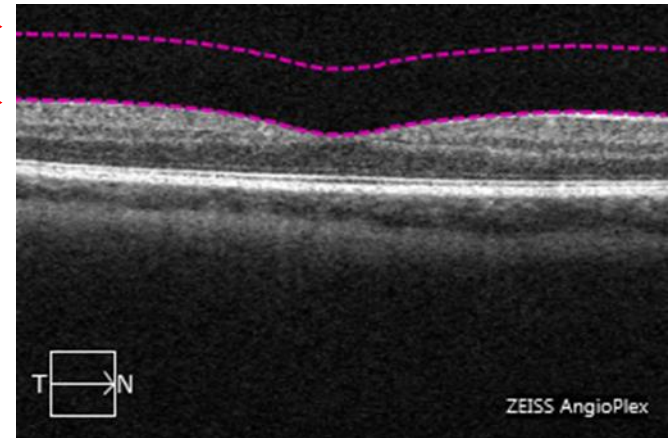
Layer Preset	Layer Boundaries	Example Image (Normal Eye)	B-scan with Layers
<p>Retina Depth Encoded</p>	<p>Combination of: Superficial, Deep, and Avascular Layers</p> <p>Superficial: Red Deep: Green Avascular: Blue</p>		
<p>Retina</p>	<p>Inner Boundary: ILM</p> <p>Outer Boundary: RPE = RPEfit - 70µm</p>		

AngioPlex Analysis Layer Presets: VRI and Superficial

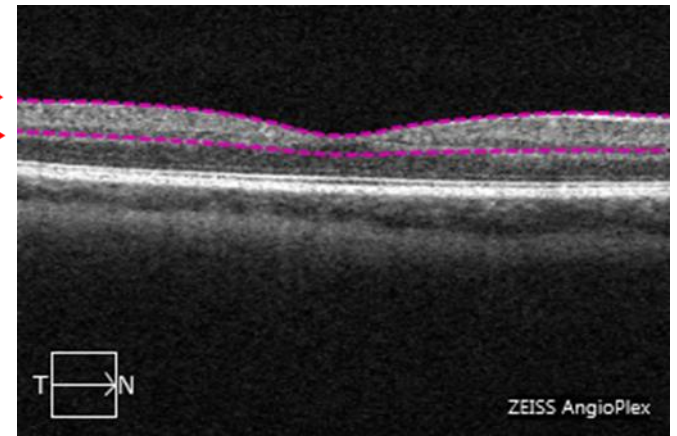
- VRI Vitreo-Retinal Interface



Inner Boundary
Outer Boundary ILM
- 300µm



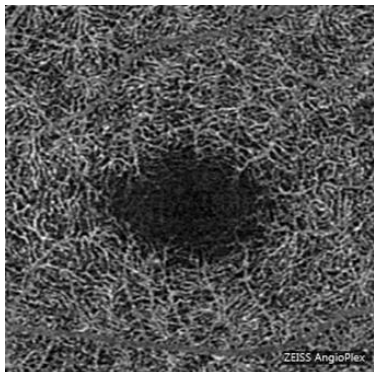
Inner Boundary ILM
IPL=ILM+70%(OPL-ILM)
Outer Boundary IPL



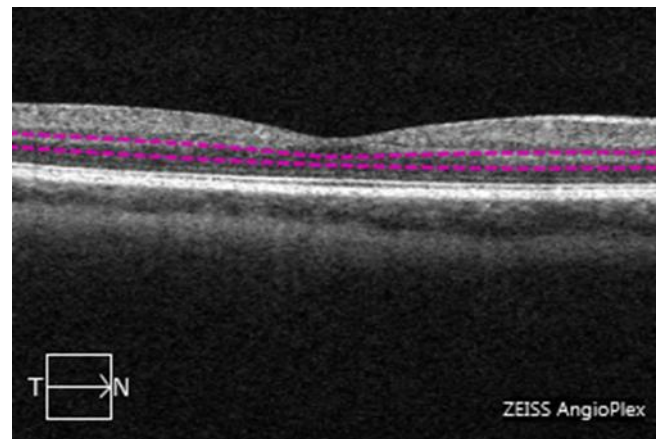
- Superficial Superficial Retinal Layer

AngioPlex Analysis Layer Presets: Deep and Avascular

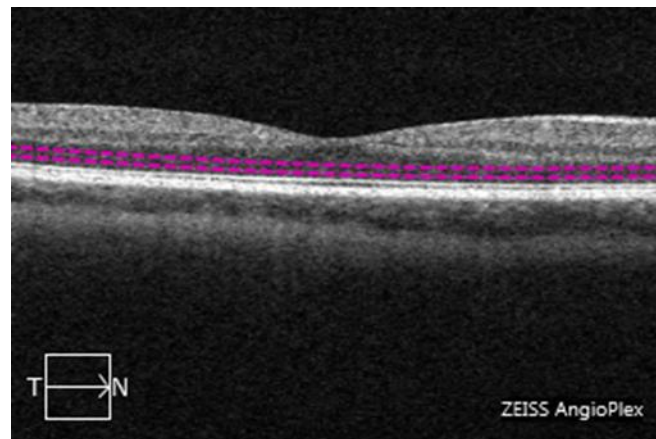
- Deep Deep Retinal Layer



Inner Boundary IPL
Outer Boundary OPL=RPEfit-110 μ m



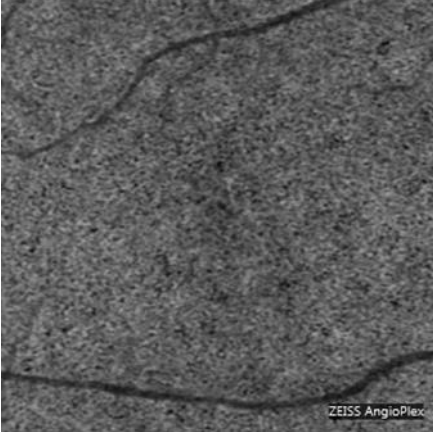
Inner Boundary OPL
Outer Boundary IS/OS=RPEfit-70 μ m



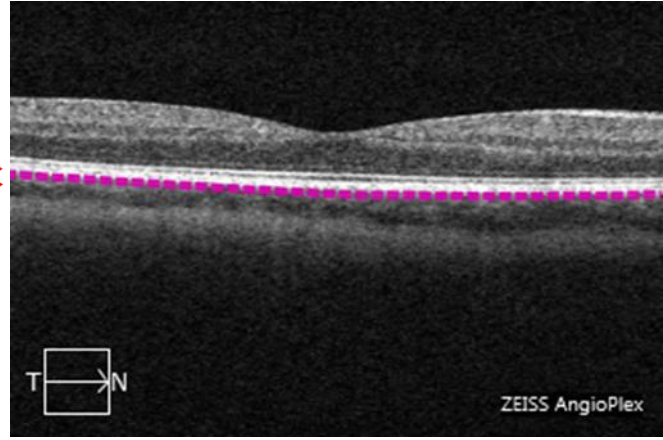
- Avascular Avascular Retina

AngioPlex Analysis Layer Presets: Choriocapillaris and Choroid

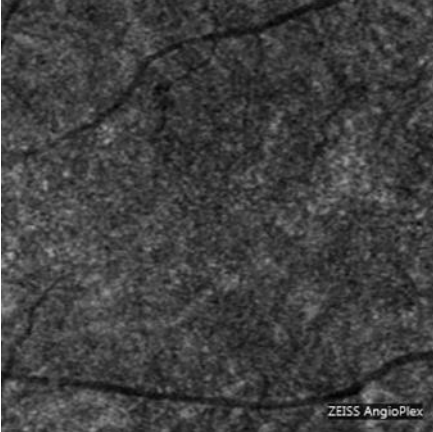
- Choriocapillaris



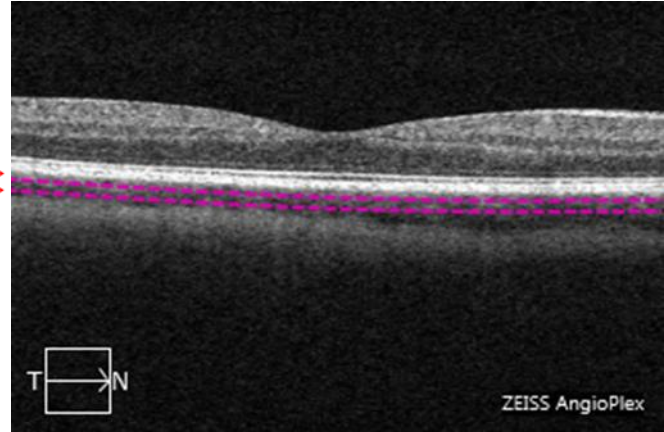
Inner Boundary CCIB=RPE+29 μ m
Outer Boundary CCOB = RPE+49 μ m



- Choroid



Inner Boundary ChIB = RPEfit + 64 μ m
Outer Boundary ChOB = RPEfit + 115 μ m



Nome: VF
 ID: 783893887
 Data di nascita:
 Sesso: Donna
 Tecnico: Angio, Cirrus

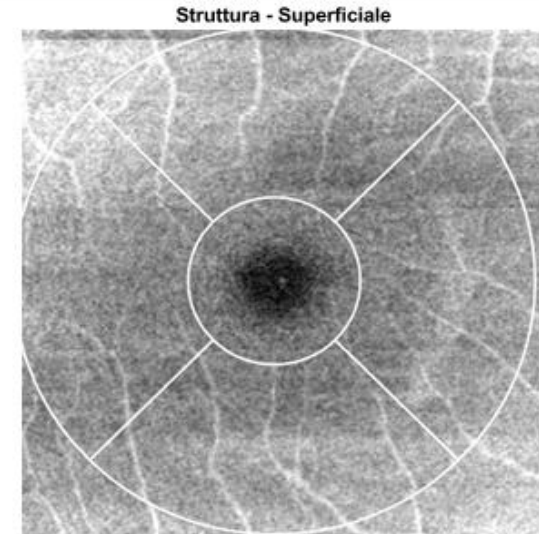
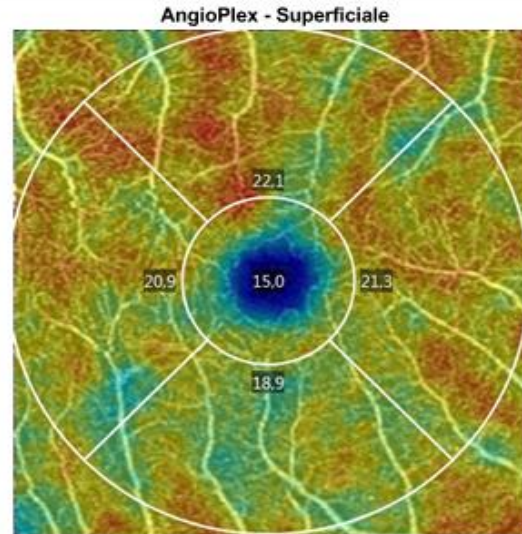
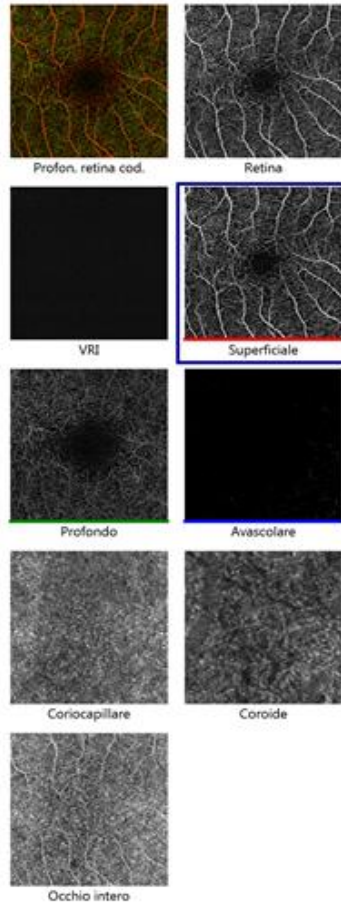
OD
 Data esame: 20/02/2016
 Ora dell'esame: 09:20
 Numero di serie: 5000-6254
 Intensità segnale: 10/10

Studio Oculistico A. Lucente



Analisi dell'angiografia : Angiography 3x3 mm

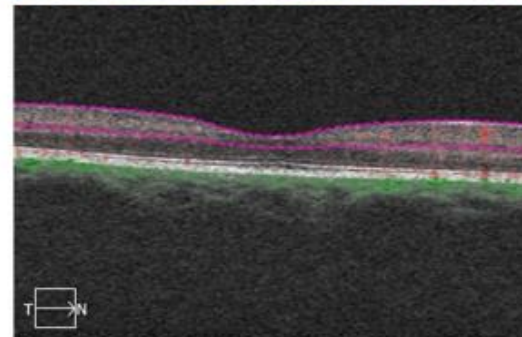
OD OS



Sovrapposizioni
 Struttura - Nessuno
 AngioPlex - Vaso Mappa

AngioPlex Metrix

ETDRS - Vaso		FAZ	
Regione	Densità	Area	0,16 mm ²
Centrale	15,0 mm ⁻¹	Perimetro	1,78 mm
Interna	20,8 mm ⁻¹	Circularità	0,64
Completo	20,2 mm ⁻¹		



Segmento: 122 Parte sup.: ILM Parte inf.: IPL

Monitorato durante la scansione

Commenti

Firma del medico

Nome: VF due
 ID: 783893887
 Data di nascita:
 Sesso: Donna
 Tecnico: Angio, Cirrus

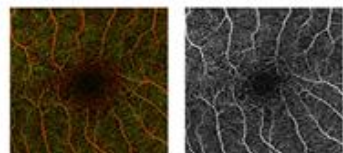
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 Ora dell'esame: 09:20
 Numero di serie: 5000-6254
 Intensità segnale: 10/10

Studio Oculistico A. Lucente



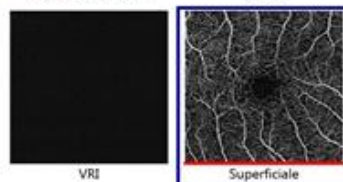
Analisi dell'angiografia : Angiography 3x3 mm

OD OS



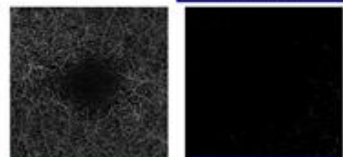
Profon. retina cod.

Retina



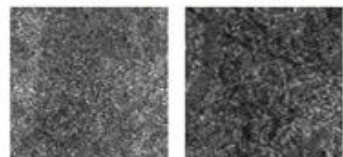
VRI

Superficiale



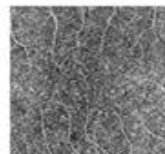
Profondo

Avascolare



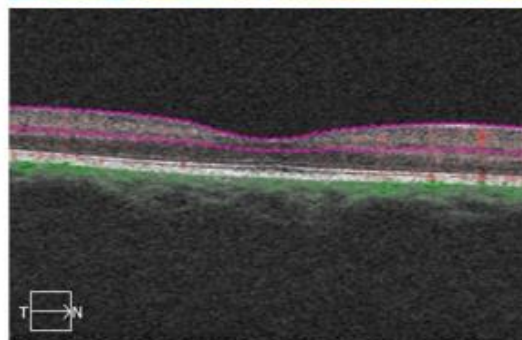
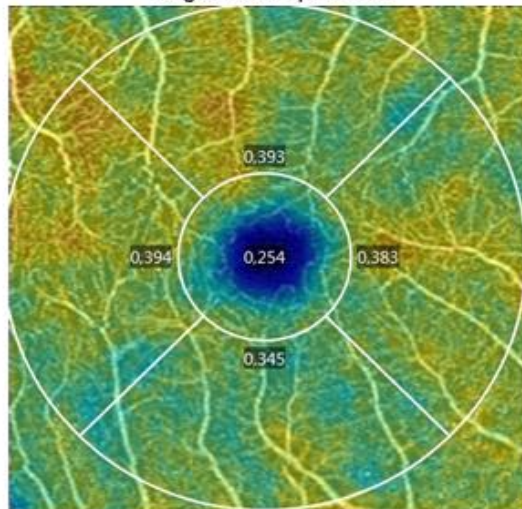
Coriocapillare

Coroide



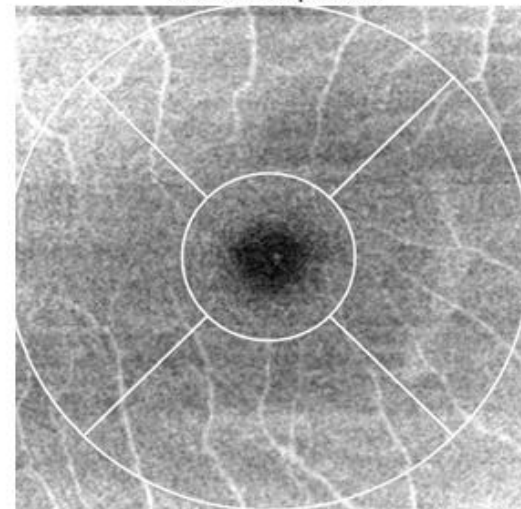
Occhio intero

AngioPlex - Superficiale



Segmento: 122 Parte sup.: ILM Parte inf.: IPL

Struttura - Superficiale



Sovrapposizioni
 Struttura - Nessuno
 AngioPlex - Perfusione Mappa

AngioPlex Matrix

ETDRS - Perfusione

Regione	Densità
Centrale	0,254
Interna	0,379
Completo	0,365

FAZ

Area	0,16 mm ²
Perimetro	1,78 mm
Circularità	0,64

Monitorato durante la scansione

Commenti

Firma del medico

Nome: VF tre
 ID: 783893887
 Data di nascita:
 Sesso: Donna
 Tecnico: Angio, Cirrus

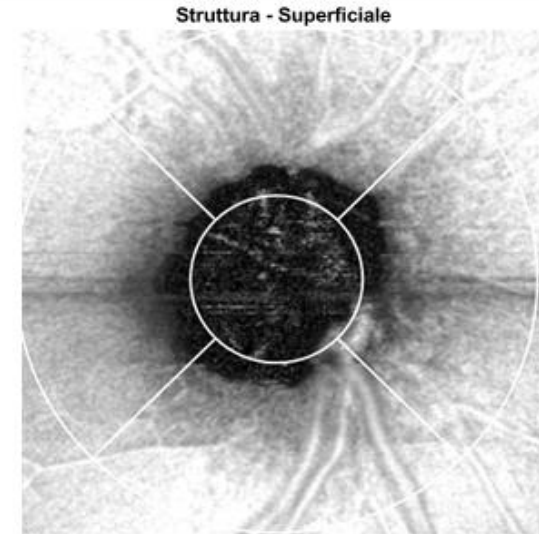
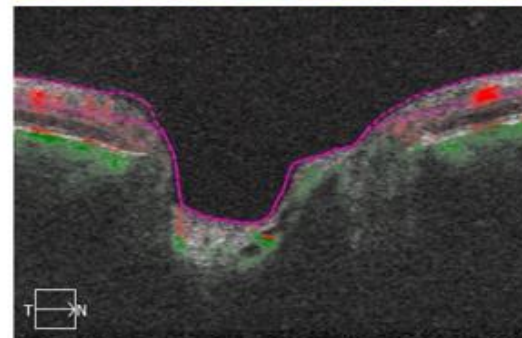
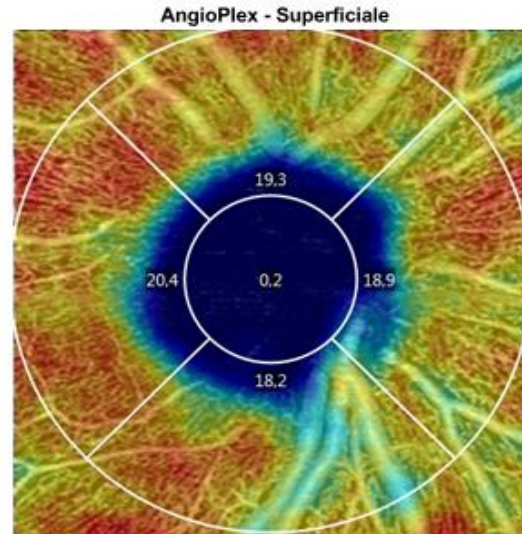
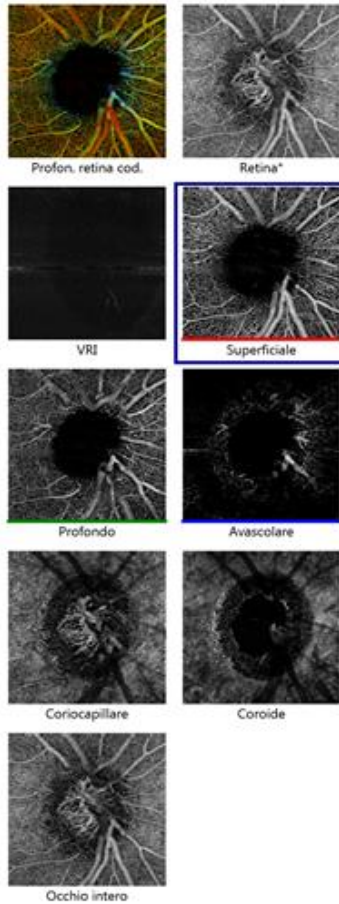
OD
 Data esame: 20/02/2016
 Ora dell'esame: 09:44
 Numero di serie: 5000-6254
 Intensità segnale: 9/10

Studio Oculistico A. Lucente



Analisi dell'angiografia : Angiography 3x3 mm

OD OS



Sovrapposizioni
 Struttura - Nessuno
 AngioPlex - Vaso Mappa

ETDRS - Vaso		AngioPlex Matrix	
Regione	Densità	Area	FAZ
Centrale	0,2 mm ⁻¹	0,00 mm ²	Perimetro
Interna	19,2 mm ⁻¹	0,14 mm	Circularità
Completo	17,1 mm ⁻¹	0,90	

Monitorato durante la scansione

Commenti

Analisi modificata: 09/04/2017 11:55

Firma del medico

Nome: SA
ID: 275554531
Data di nascita:
Sesso: Uomo
Tecnico: Angio, Cirrus

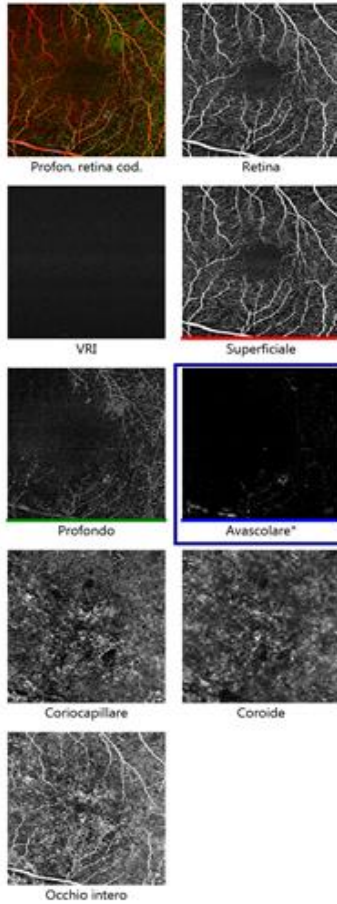
OS
Data esame: 28/03/2017
Ora dell'esame: 09:19
Numero di serie: 5000-6254
Intensità segnale: 6/10

Studio Oculistico A. Lucente

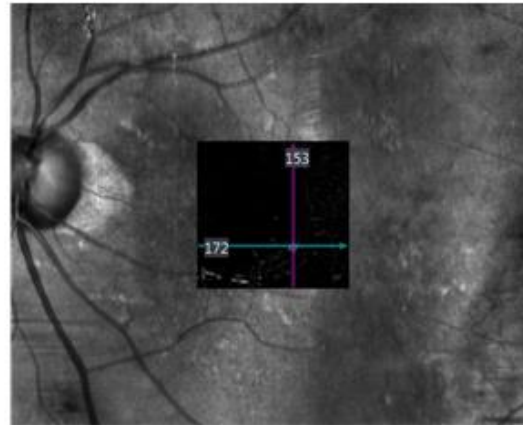


Analisi dell'angiografia : Angiography 3x3 mm

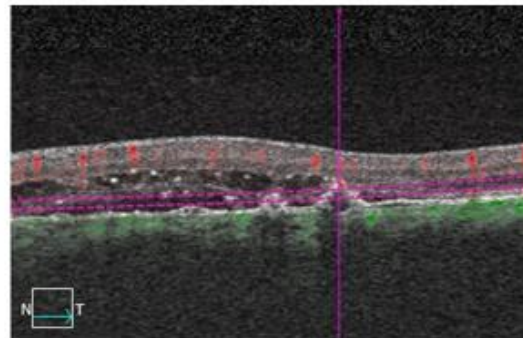
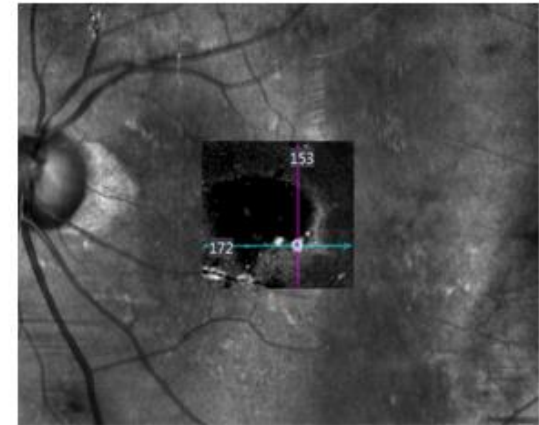
OD OS



AngioPlex - Avascolare



Struttura - Avascolare



Segmento: 172 Parte sup.: OPL Parte inf.: RPEFit-56µ

Sovrapposizioni
Struttura - Nessuno
AngioPlex - Nessuno

Monitorato durante la scansione

Commenti

Analisi modificata: 28/03/2017 09:26

Firma del medico

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Pagina 1 di 1

Nome: **SAtre**
 ID: 275554531
 Data di nascita:
 Sesso: Uomo
 Tecnico: Angio, Cirrus

Data esame:
 Ora dell'esame:
 Numero di serie:
 Intensità segnale:

Precedente **Corrente**
 21/04/2016 28/03/2017
 11:25 09:20
 5000-6254 5000-6254
 8/10 7/10

Studio Oculistico A. Lucente



Analisi angiografica della variazione : Angiography 6x6 mm

OD OS

Esame 1 (scansione precedente)

21/04/2016 11:25:03

Segnale (8/10)



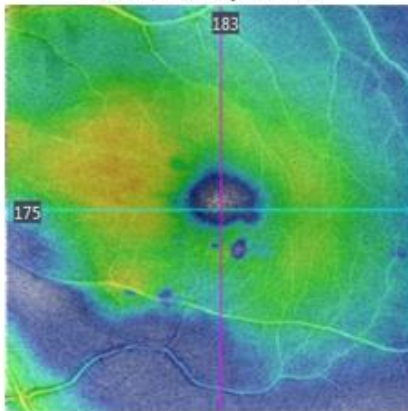
Segnale (7/10)



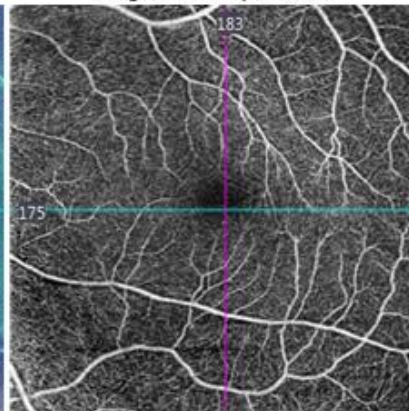
Esame 2 (scansione selezionata)

28/03/2017 09:20:28

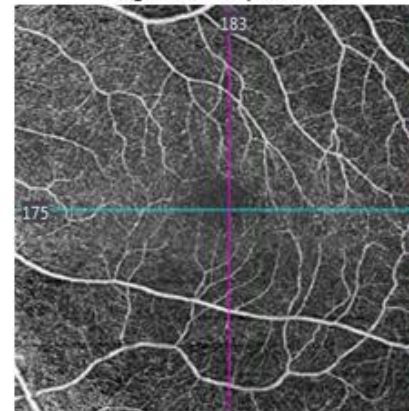
Struttura - Superficiale



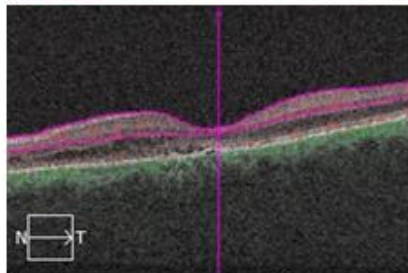
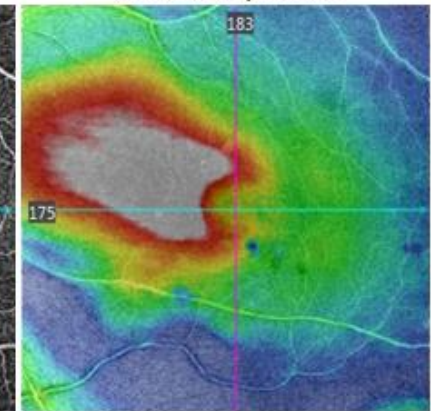
AngioPlex - Superficiale



AngioPlex - Superficiale



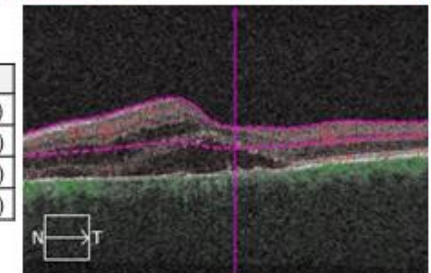
Struttura - Superficiale



Sovrapposizioni
 Struttura - Mappa dello spessore
 AngioPlex - Nessuno

Angiometria
 ETDRS - Vaso

Regione	Esame 1	Esame 2	Differenza
Centrale	5,8 mm ⁻¹	9,6 mm ⁻¹	3,8 mm ⁻¹ (66%)
Interna	16,7 mm ⁻¹	16,6 mm ⁻¹	-0,1 mm ⁻¹ (-1%)
Esterna	16,6 mm ⁻¹	15,7 mm ⁻¹	-0,9 mm ⁻¹ (-5%)
Completo	16,3 mm ⁻¹	15,7 mm ⁻¹	-0,6 mm ⁻¹ (-4%)



Parte sup.: ILM Parte inf.: IPL
 Monitorato durante la scansione

Parte sup.: ILM Parte inf.: IPL
 Monitorato durante la scansione
 Modificato: 28/03/2017 09:27:48

FAZ

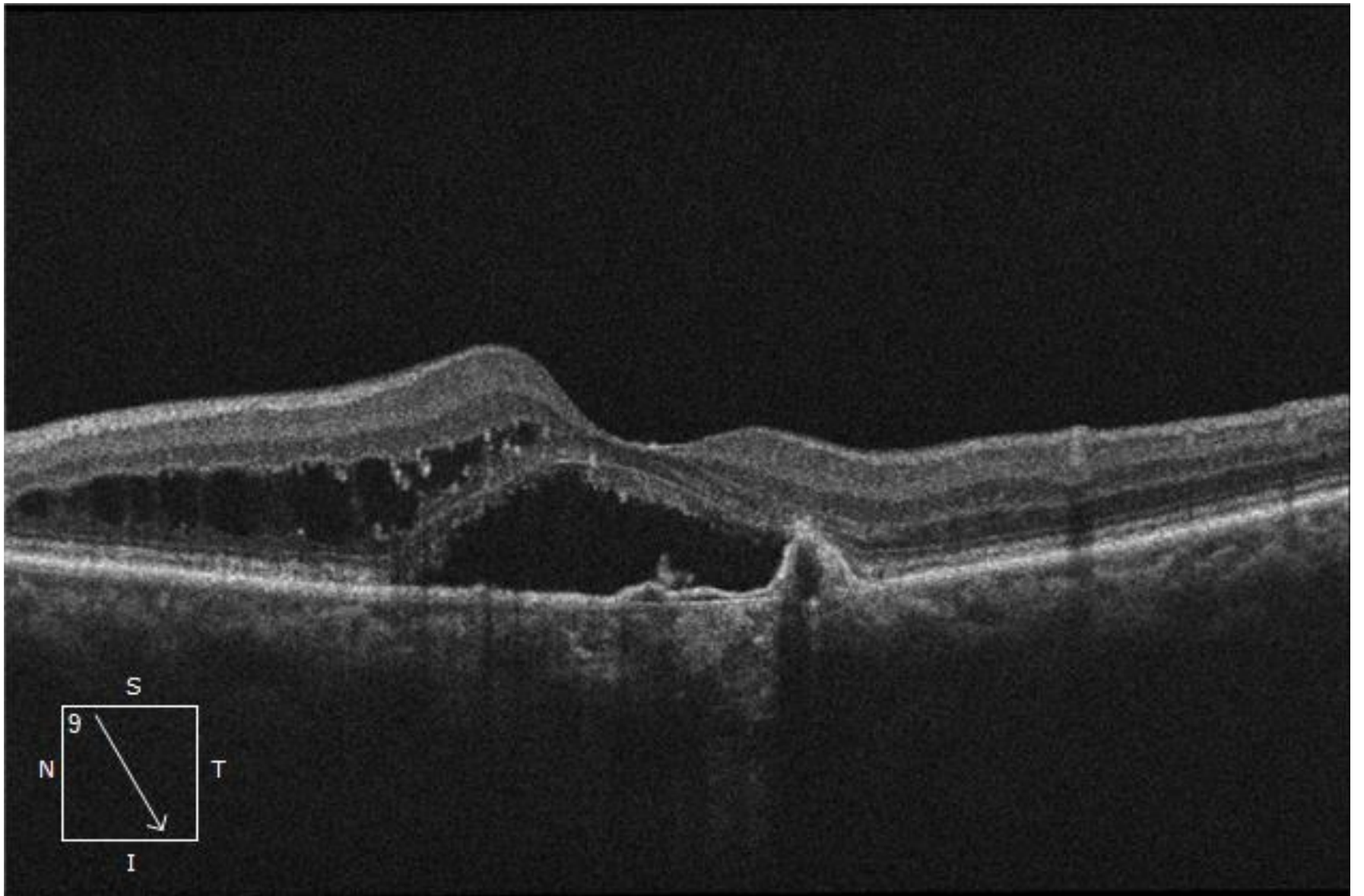
	Esame 1	Esame 2	Differenza
Area	0,24 mm ²	0,35 mm ²	0,11 mm ² (46%)
Perimetro	2,02 mm	2,96 mm	0,94 mm (47%)
Circularità	0,74	0,50	-0,24 (-32%)

Commenti

Analisi modificata: 28/03/2017 09:27

Firma del medico

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Nome: MBdue
ID: 634456147
Data di nascita:
Sesso: Uomo
Tecnico: Angio, Cirrus

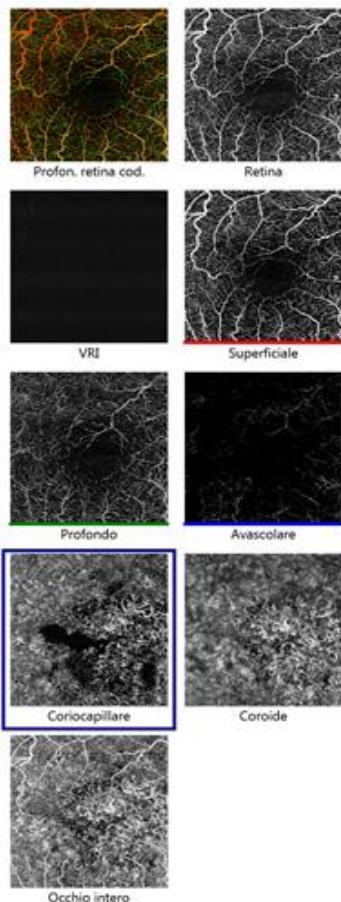
OD
Data esame: 16/01/2017
Ora dell'esame: 12:01
Numero di serie: 5000-6254
Intensità segnale: 9/10

Studio Oculistico A. Lucente

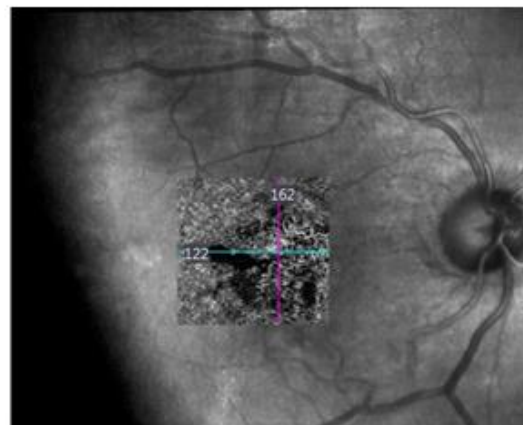


Analisi dell'angiografia : Angiography 3x3 mm

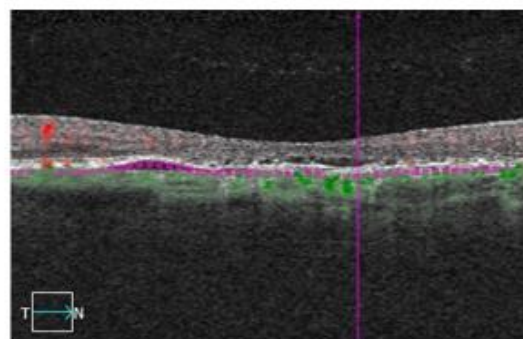
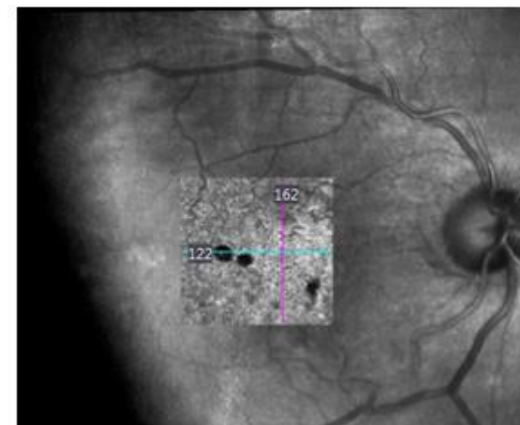
OD OS



AngioPlex - Coriocapillare



Struttura - Coriocapillare



Segmento: 122 Parte sup.: RPE+29μ Parte inf.: RPE+49μ

Sovrapposizioni
Struttura - Nessuno
AngioPlex - Nessuno

Monitorato durante la scansione

Commenti

Firma del medico

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Pagina 1 di 1

Nome: MB
 ID: 634456147
 Data di nascita:
 Sesso: Uomo
 Tecnico: Angio, Cirrus

Data esame:
 Ora dell'esame:
 Numero di serie:
 Intensità segnale:

Precedente 16/03/2017 09:57 5000-6254 6/10
 Corrente 20/04/2017 16:32 5000-6254 7/10

Studio Oculistico A. Lucente



Analisi angiografica della variazione : Angiography 3x3 mm

OD OS

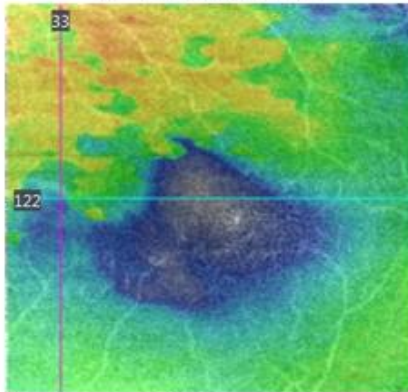
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16/03/2017 09:57:55

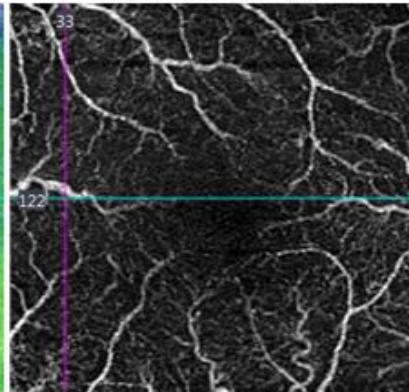
Segnale (6/10)



Struttura - Superficiale



AngioPlex - Superficiale



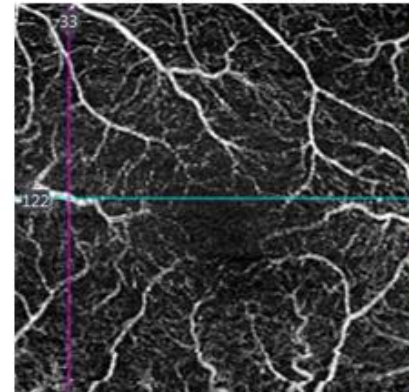
Segnale (7/10)



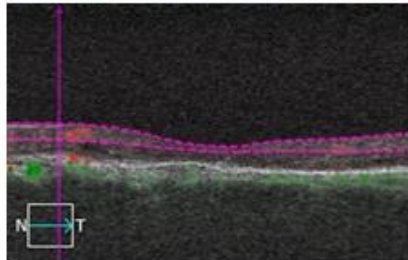
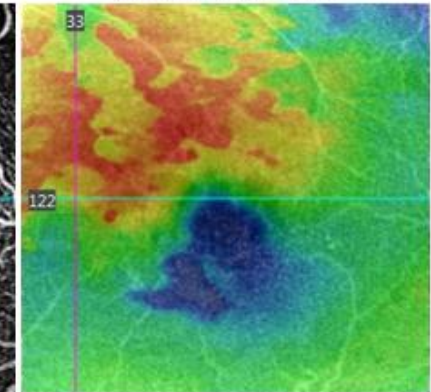
Esame 2 (scansione selezionata)

20/04/2017 16:32:24

AngioPlex - Superficiale



Struttura - Superficiale



Sovrapposizioni
 Struttura - Mappa dello spessore
 AngioPlex - Nessuno

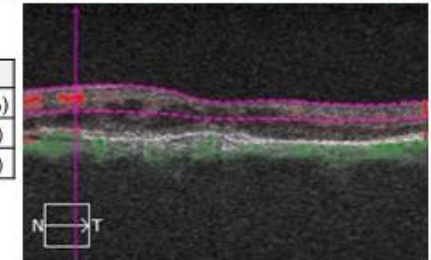
Angiometria

ETDRS - Vaso

Regione	Esame 1	Esame 2	Differenza
Centrale	2,4 mm ⁻¹	5,1 mm ⁻¹	2,7 mm ⁻¹ (113%)
Interna	10,8 mm ⁻¹	13,1 mm ⁻¹	2,3 mm ⁻¹ (21%)
Completo	9,9 mm ⁻¹	12,2 mm ⁻¹	2,3 mm ⁻¹ (23%)

FAZ

	Esame 1	Esame 2	Differenza
Area	-	0,05 mm ²	-
Perimetro	-	1,01 mm	-
Circularità	-	0,59	-



Parte sup.: ILM Parte inf.: IPL
 Monitorato durante la scansione

Parte sup.: ILM Parte inf.: IPL
 Monitorato durante la scansione

Commenti

Firma del medico

CIRRUS ANGIO
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Nome: **FA**
 ID: CZMI1545286560
 Data di nascita:
 Sesso: Unknown
 Tecnico: Angio, Cirrus

Data esame: 08/06/2016 09:22
 Ora dell'esame: 09:22
 Numero di serie: 5000-6254
 Intensità segnale: 8/10

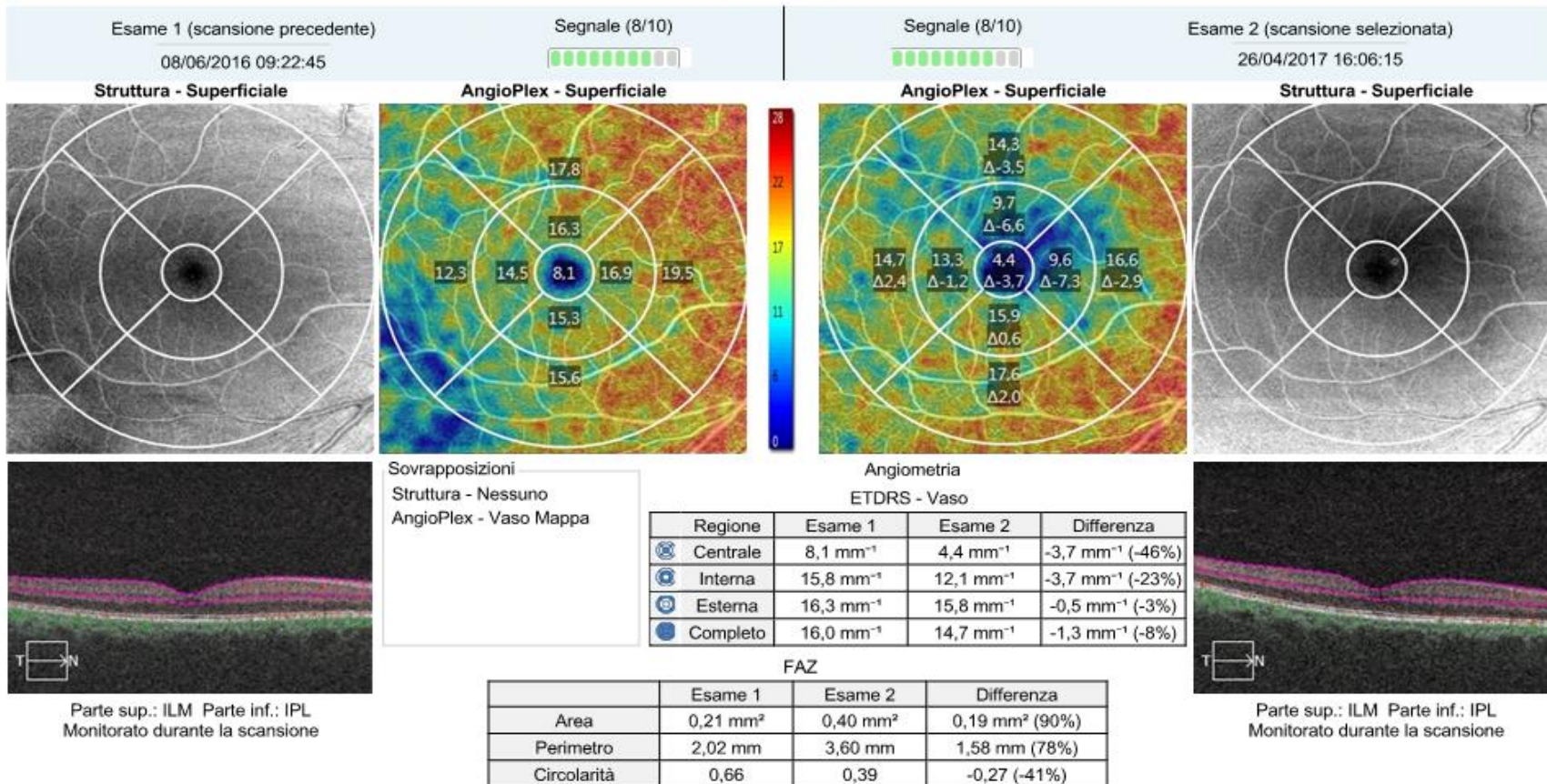
Precedente 08/06/2016 09:22
 Corrente 26/04/2017 16:06
 Numero di serie: 5000-6254
 Intensità segnale: 8/10

Studio Oculistico A. Lucente



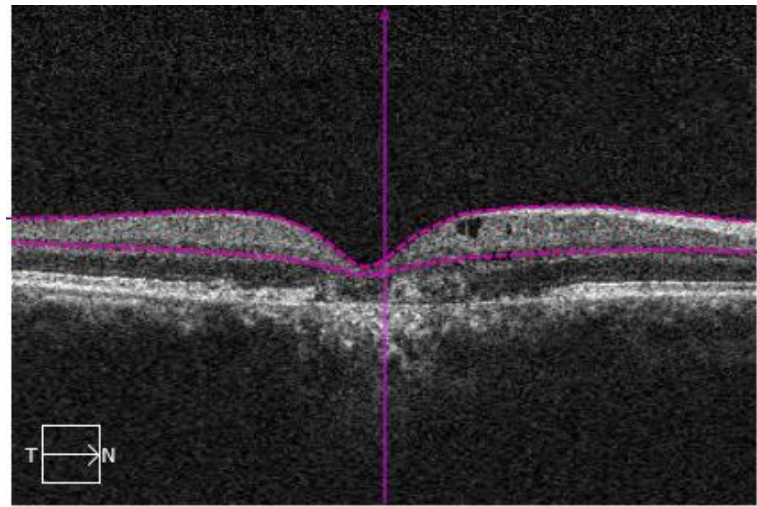
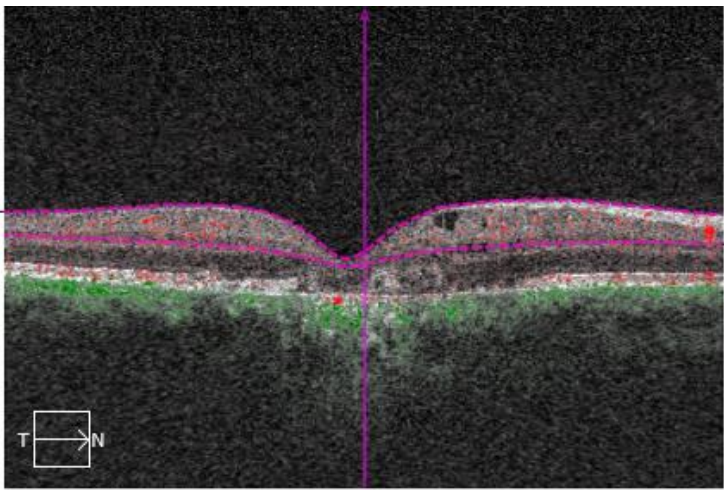
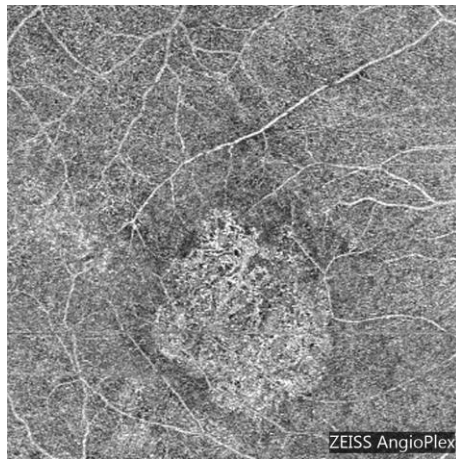
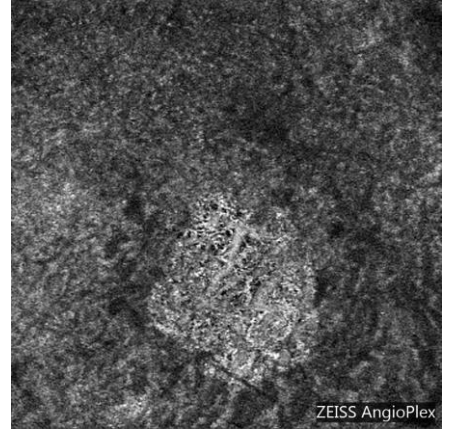
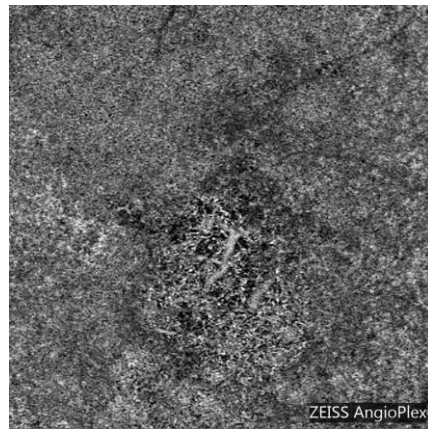
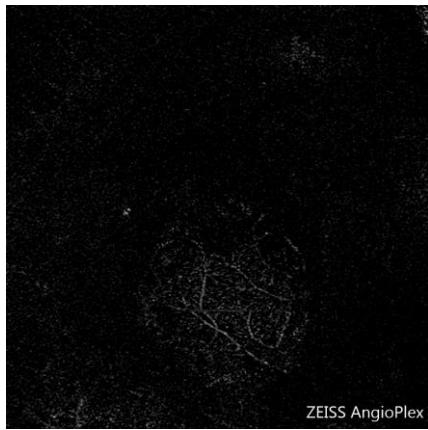
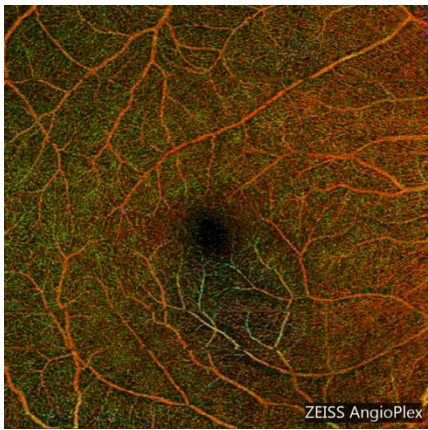
Analisi angiografica della variazione : Angiography 6x6 mm

OD ● ○ OS



Commenti

Firma del medico

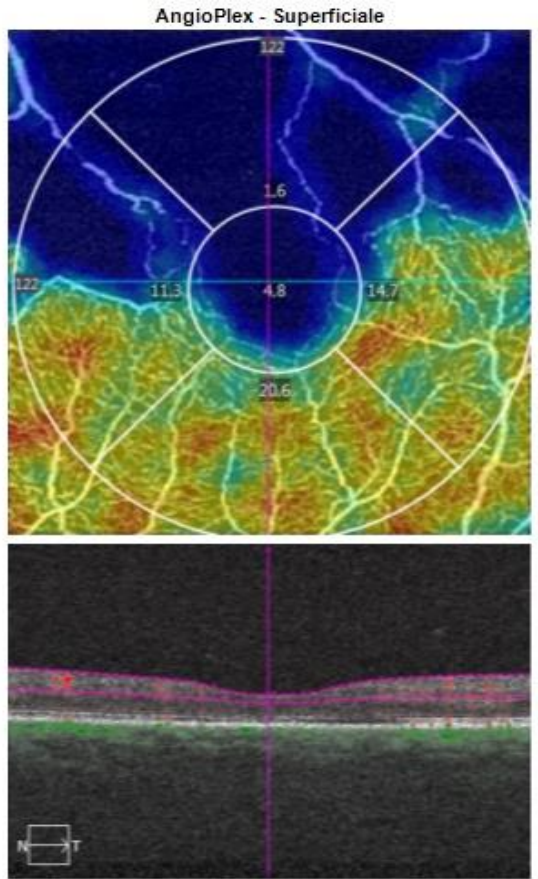
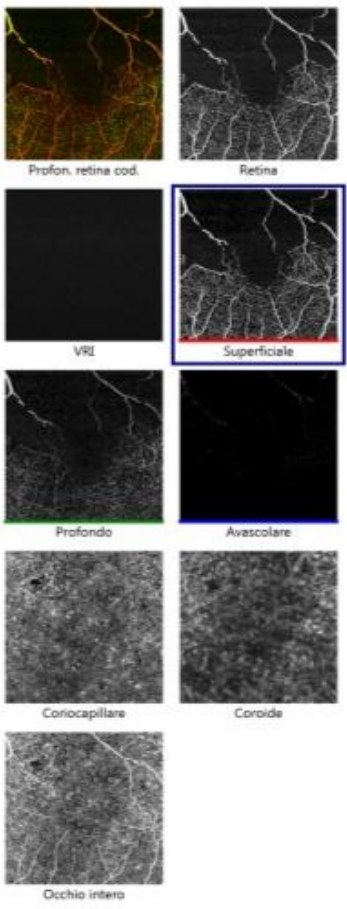


Nome:
 ID: 117361906
 Data di nascita: 25/05/1951
 Sesso: Donna
 Tecnico: Angio, Cirrus

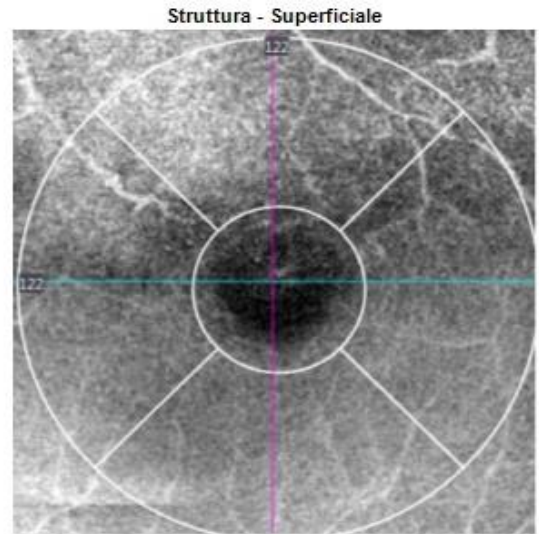
OS
 Data esame: 05/07/2016
 Ora dell'esame: 11:07
 Numero di serie: 5000-6254
 Intensità segnale: 9/10

Analisi dell'angiografia : Angiography 3x3 mm

OD OS



Segmento: 122 Parte sup.: ILM Parte inf.: IPL



Sovrapposizioni
 Struttura - Nessuno
 AngioPlex - Vaso Mappa

AngioPlex Metrix

ETDRS - Vaso		FAZ	
Regione	Densità	Area	-
Centrale	4,8 mm ⁻¹	Perimetro	-
Interna	12,0 mm ⁻¹	Circularità	-
Completo	11,2 mm ⁻¹		

Monitorato durante la scansione

Commenti

Firma del medico

Nome: CR
ID: 2099419900
Data di nascita:
Sesso: Donna
Tecnico: Angio, Cirrus

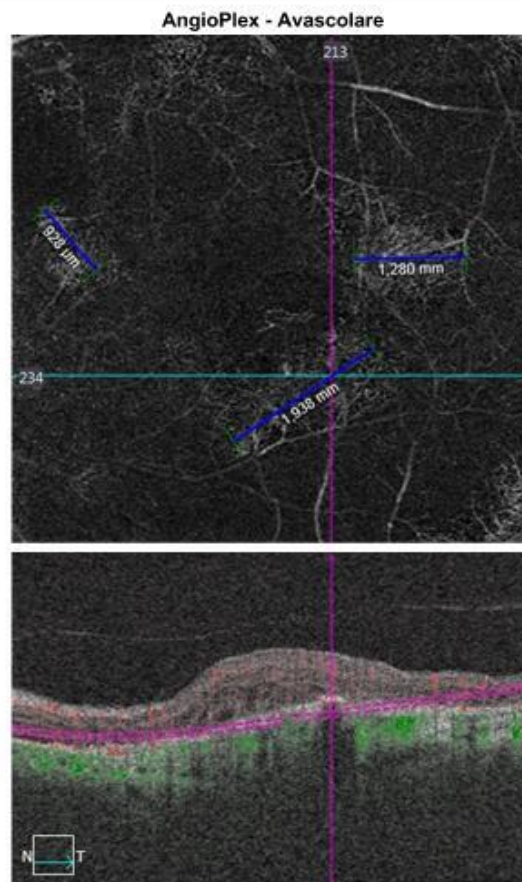
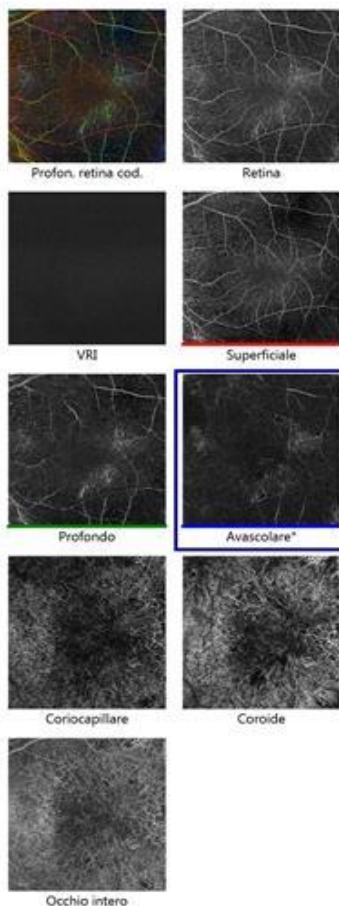
OS
Data esame: 19/09/2016
Ora dell'esame: 16:22
Numero di serie: 5000-6254
Intensità segnale: 7/10

Studio Oculistico A. Lucente

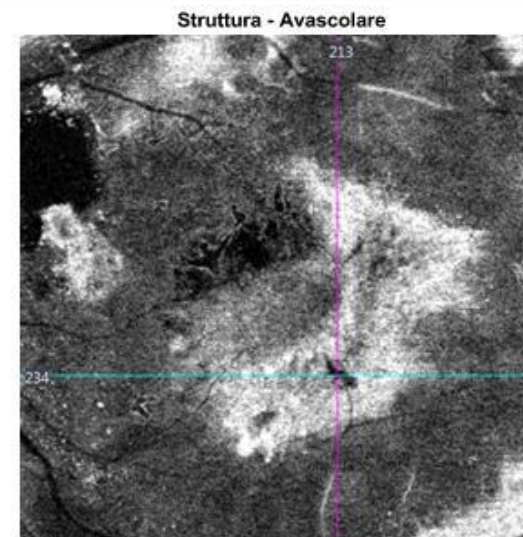


Analisi dell'angiografia : Angiography 6x6 mm

OD OS



Segmento: 234 Parte sup.: OPL+8 μ Parte inf.: RPEFit-70 μ



Sovrapposizioni
Struttura - Nessuno
AngioPlex - Nessuno

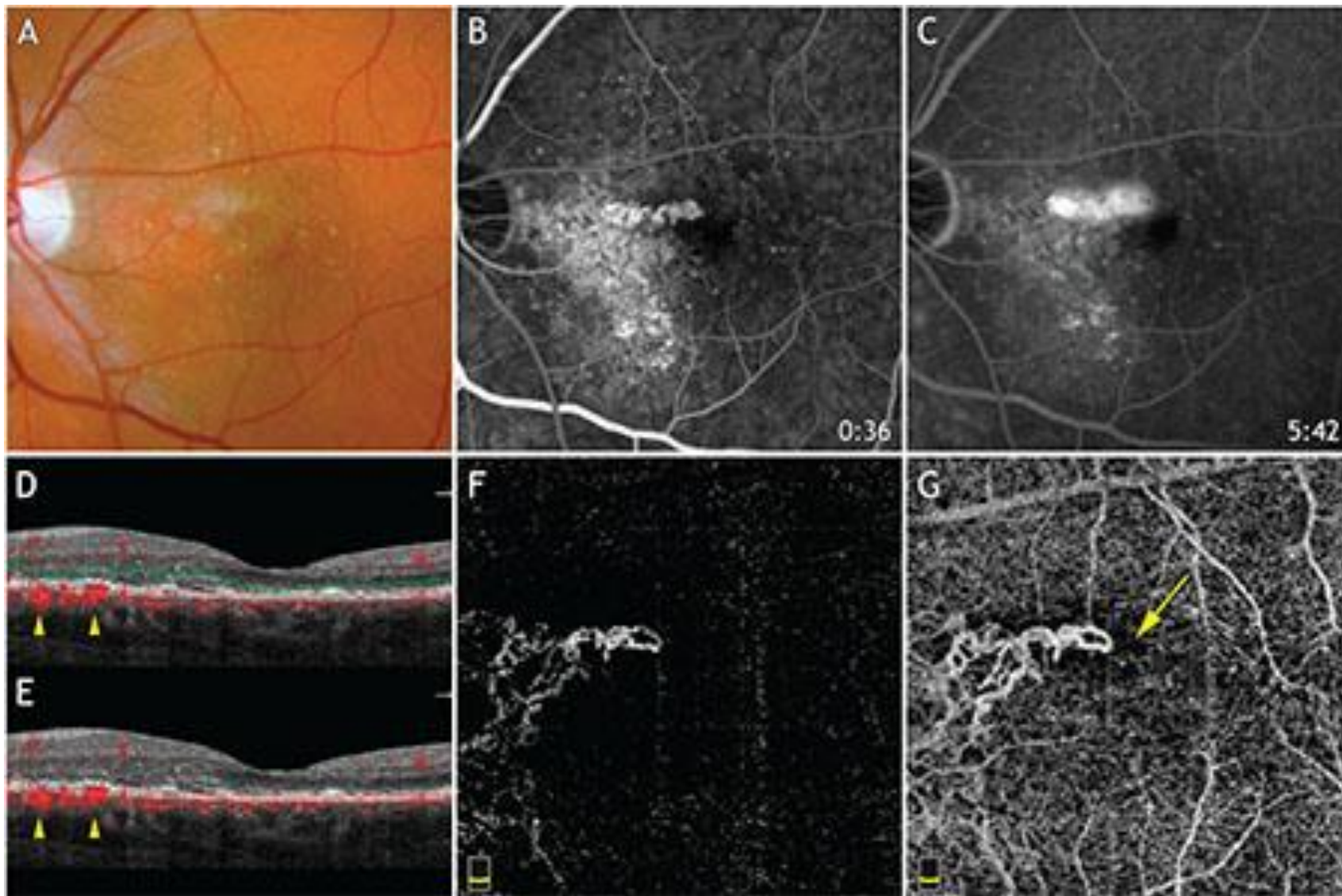
Monitorato durante la scansione

Commenti

Analisi modificata: 09/05/2017 16:47

Firma del medico

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Pagina 1 di 1



Multimodal imaging of a 63-year-old patient with choroidal neovascularization secondary to central serous chorioretinopathy. (A) Color photograph shows a subretinal hemorrhage at the center of the macula surrounded by retinal pigment epithelium clumps. Early (B) and late-phase (C) fluorescein angiography show leakage from CNV. (D) and (E) represent corresponding OCT B-scan segmentation of the outer retina and choriocapillaris, respectively. Yellow arrowheads point to the decorrelation signal below the RPE detachment suggestive of CNV. (F) OCT angiogram segmented at the level of the outer retina reveals CNV. (G) OCT angiogram segmented at the level of the choriocapillaris. The yellow arrow highlights the hypo-intense halo surrounding the CNV



**Studio Oculistico
dott. Amedeo Lucente**

Via dei Glicini 14 - 87012 CASTROVILLARI Tel e Fax: 0981/483071
e.mail: amedeolucente@libero.it; www.amedeolucente.it

Tomografia Ottica a Radiazione Coerente (HD-OCT AngioPlex Zeiss)

Referto del Signor/ra

(HD-OCT n°)

Profilo Retinico:

Struttura Retinica:

Volumi Retinici:

Retina Interna:

Retina Esterna:

Complesso EPR/Coriocabillare/Coroide:

ONH:

RNFL Average:

GCL Average:

Angio-OCT Retina:

Angio-OCT ONH:

AS-OCT:

Combo Report:

CONCLUSIONI:

dott. Amedeo Lucente

Se ascolto dimentico, se vedo ricordo, se faccio capisco



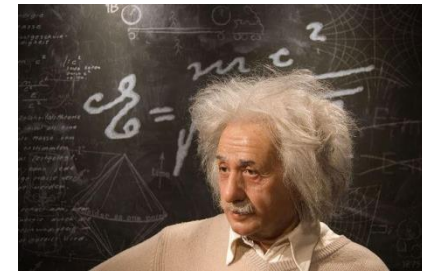
Confucio 551 a.C. – 479 a.C

Misura ciò che è misurabile, e rendi misurabile ciò che non lo è



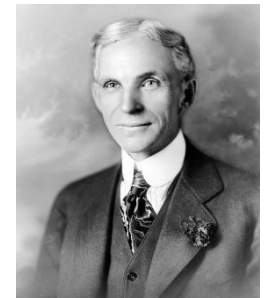
G. Galileo 1564 – 1642

**Tutto dovrebbe essere reso il più semplice possibile,
ma non più semplicistico**



A. Einstein 1879 – 1955

**C'è vero progresso solo quando i vantaggi di una nuova
tecnologia diventano per tutti**



Henry Ford 1863-1947

Thank you for your kind attention!

Angio-Plex Cirrus HD Zeiss Über Alles

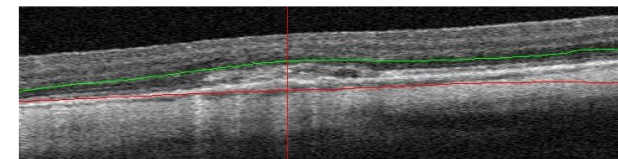
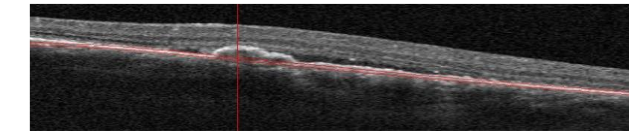
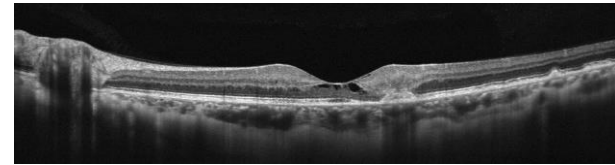
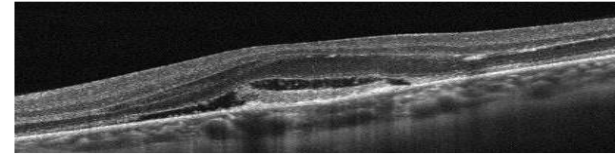
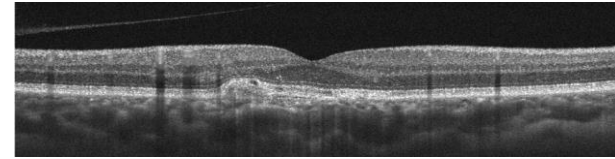


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- La scheletrizzazione (skeletonization) è un processo sistematico di sottrazione di voxel (pixel in 3D) da maschere binarie (1,0) tomografiche, fino a lasciare una traccia finale di voxel, la più spessa, rilevata e definita con l'applicazione dell'algoritmo di Lee et al
- Questo processo di calcolo algoritmico richiede un adeguato linguaggio di programmazione che s'interfaccia con MATLAB.
- MATLAB (Matrix Laboratory, MathWorks, Natick, MA, USA), creato alla fine degli anni Settanta da Cleve Moler, è un ambiente per il calcolo numerico e l'analisi statistica scritto in C (C = linguaggio di programmazione ad alto livello), che consente di manipolare matrici, visualizzare funzioni e dati, implementare algoritmi, creare interfacce utente, comunicare con altri programmi.
- La Wide-Field e la Ultra Wide-Field imaging sono metodiche d'imaging ad ampio campo.
- Il Color-Coded in angio-OCT è un'imaging composta dall'insieme di più campi angiografici en-face dyeless, utilizza ampiamente Adobe Photoshop™, permette un confronto più agevole con le immagini Fluoro/ICG, e offre la possibilità ad ampio campo Wide Field.
- Il sistema d'elaborazione, scomposizione e dimensione frattale è, in definitiva, un modo per stimare la complessità dell'imaging biomedicale e renderla leggibile in dati statistici ed iconografici. Si avvale indispensabilmente della texture analysis (Fractal Texture Analysis), branca della scienza dell'imaging utile per la descrizione strutturale delle immagini dei tessuti biologici.

CNV Classification based on location

- Type 1: below RPE (Jung and Freund AJO 2014)
- Type 2: above RPE
- Type 3: intraretinal
- Type 4: mixed 1-2
- Filamentous (pachychoroid) NVs
- Myopic CNVs
- Residual flow in fibrosis



A Montage of 6x6mm Angio-OCT

