7-10 novembre 2013, Bari

12° Congresso Nazionale AME
6th Joint Meeting with AACE

Update in Endocrinologia Clinica

Terapia della retinopatia diabetica: quando e come

Laser-terapia

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Bari, 7-10 novembre 2013

ASL TA
P.O. Centrale
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S.C. di Oftalmologia

Cos'è il laser

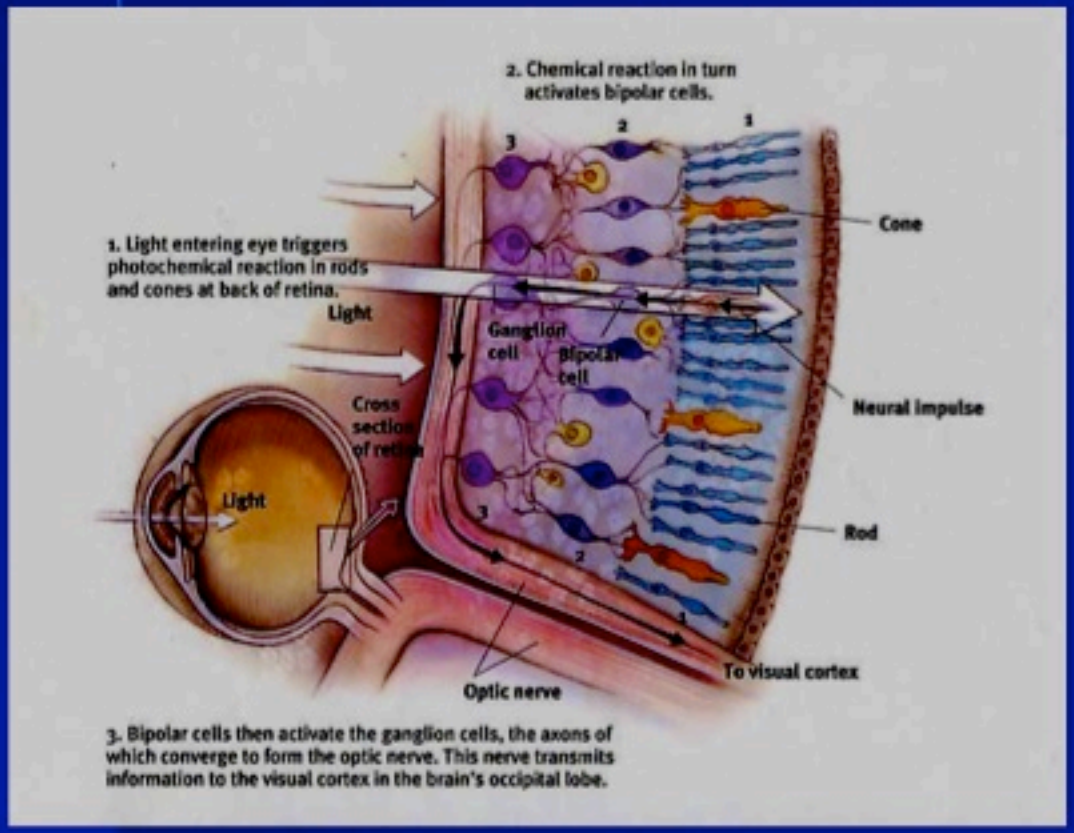
- **L**igth
- **A**mplification (by)
- **S**timulated
- **E**mission (of)
- **R**adiation

Onde elettromagnetiche a frequenza ottica in concordanza di fase che generano una luce coerente in continuità di fase e monocromatica

Cosa fa il laser sui tessuti

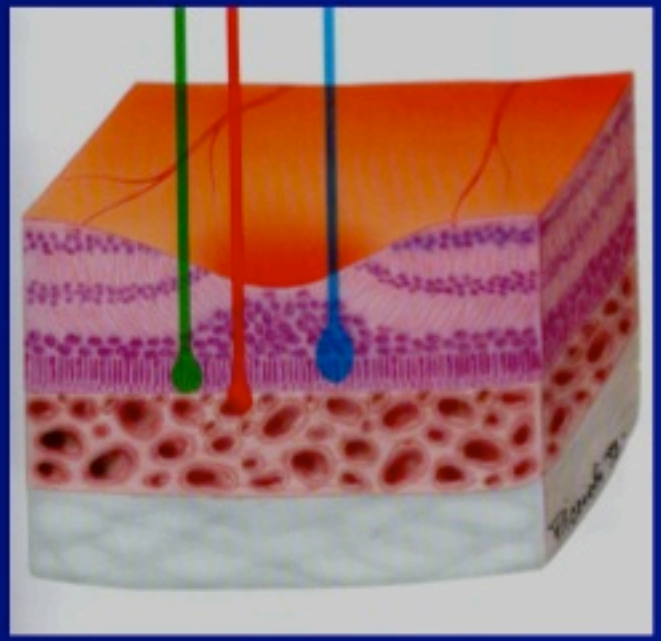
- **Effetto Fotomeccanico** (Yag Laser): seziona i tessuti
- **Effetto Fotochimico**: (Eccimeri): fotoablazione dei tessuti
- **Effetto termico** (Argon, ecc.): coagulazione dei tessuti (ne esistono di diversa lunghezza d'onda che agiscono in maniera selettiva su determinati strati della retina)

Gli strati retinici

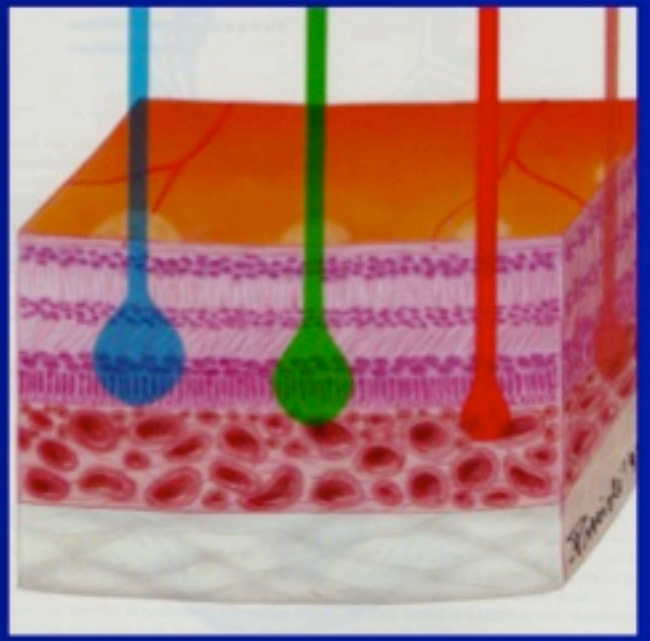


Azione selettiva dei vari laser sui diversi strati della retina

448nm 514nm 647nm 580/600nm

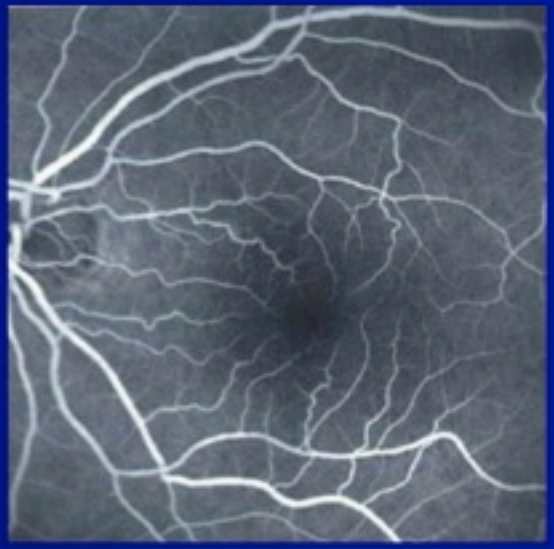


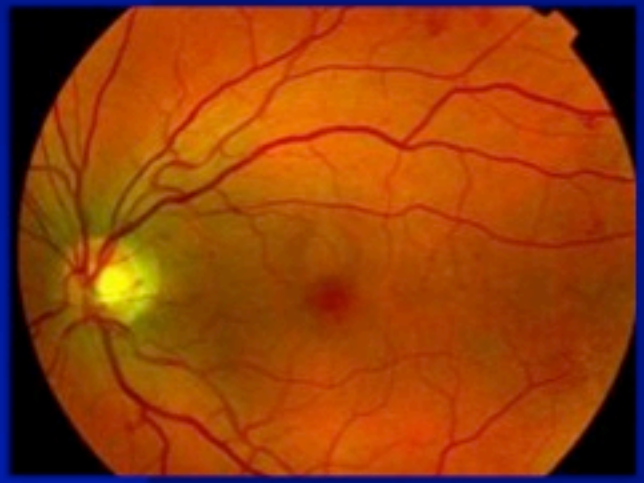
Macula

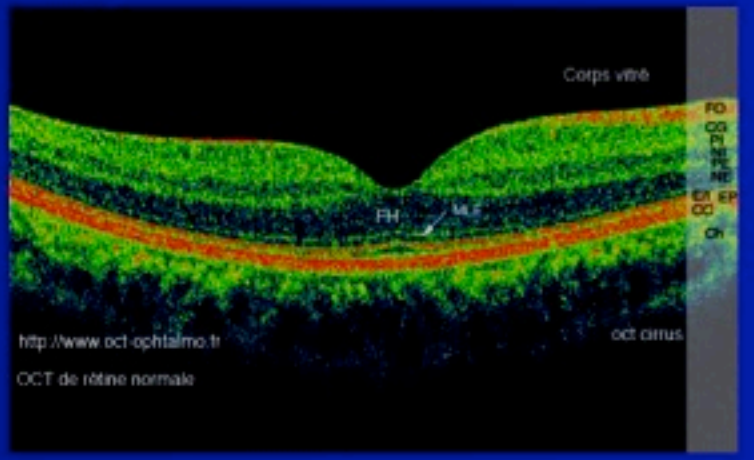


Retina periferica

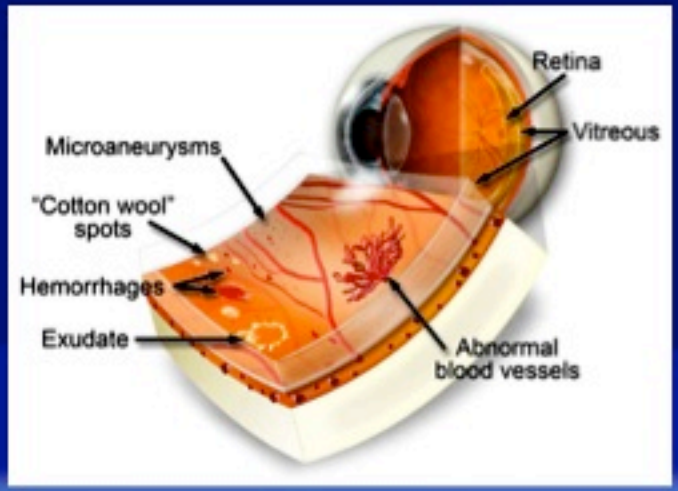
Come si studia la retina del diabetico







Classificazione della Retinopatia Diabetica



INTERNATIONAL CLINICAL DIABETIC RETINOPATHY DISEASE SEVERITY SCALE

Proposed Disease Severity Level	Findings Observable upon Dilated Ophthalmoscopy
No apparent retinopathy	No abnormalities
Mild NPDR	Microaneurysms only
Moderate NPDR	More than just microaneurysms but less than severe NPDR
Severe NPDR **Pre -Proliferante**	Any of the following and no signs of proliferative retinopathy: • More than 20 intraretinal hemorrhages in each of four quadrants • Definite venous beading in two or more quadrants • Prominent IRMA in one or more quadrants
PDR	One or both of the following: • Neovascularization • Vitreous/preretinal hemorrhage

IRMA = intraretinal microvascular abnormalities; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy

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Razionale del trattamento laser nella retinopatia diabetica

- Si utilizzano laser ad effetto termico
- Distruzione selettiva delle aree ischemiche

- Obliterazione di microaneurismi e di neovasi

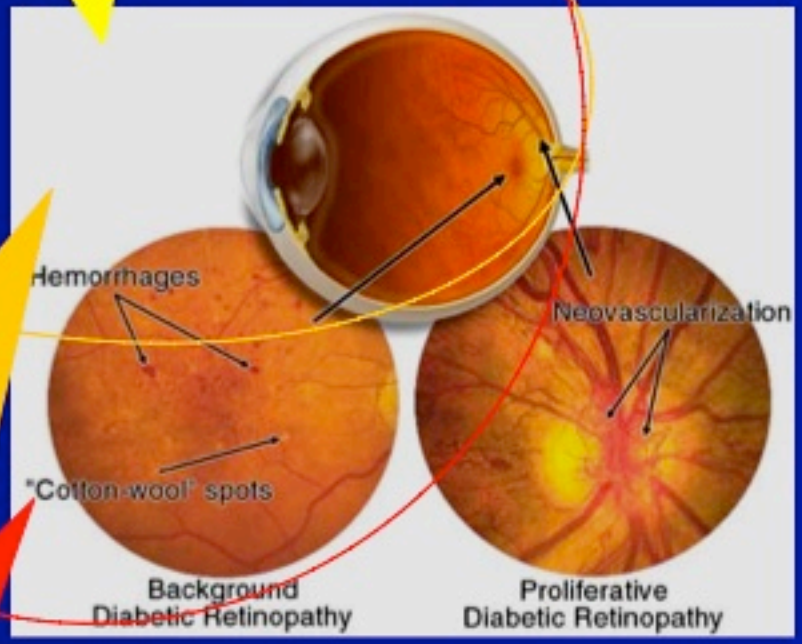
- Coagulazione e/o distruzione dell'epitelio pigmentato

Retinopatia Diabetica
(il trattamento laser)

RD NON PROLIFERANTE:
microaneurismi, emorragie, essudati duri, edema maculare

RD PRE-PROLIFERANTE:
vene a corona di rosario, noduli cotonosi, alterazioni microvascolari intraretiniche, emorragie, aree di ischemia retinica

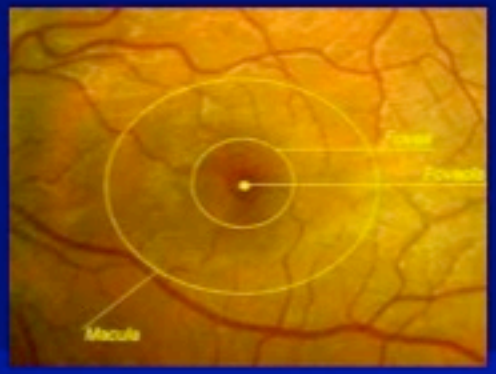
RD PROLIFERANTE:
neovasi della retina e/o del disco ottico, proliferazioni fibrovascolari, emorragie vitreali, distacchi retinici parcellari trazionali



Quando è indicato il laser nella Retinopatia diabetica non proliferante

- Trattamento focale in casi selezionati
  - **Essudati circinnati** : TT. Focale delle lesioni microvascolari al centro della corona di essudati
  - **Edema retinico localizzato**: griglia sulle aree edematose
  - **Edema retinico diffuso**: griglia del polo posteriore + TT. Focale di punti di diffusione
  - **Edema maculare cistoide**: griglia maculare

Edema Maculare Diabetico : Definizione



DIABETIC MACULAR EDEMA DISEASE DEFINITIONS IN THE EARLY TREATMENT OF DIABETIC RETINOPATHY STUDY

Disease Severity Level	Findings Observable upon Dilated Ophthalmoscopy
Diabetic macular edema apparently absent	No apparent retinal thickening or hard exudates in posterior pole
Diabetic macular edema apparently present	Thickening of retina within one disc diameter of the center of the macula; and/or hard exudates ≥ standard photograph 3* in a standard 30° photographic field centered on the macula (field 2), with some hard exudates within one disc diameter of the center of the macula
Clinically significant macular edema	Retinal thickening at or within 500 µm of the center of the macula; and/or hard exudates at or within 500 µm of the center of the macula, if associated with thickening of the adjacent retina; and/or a zone or zones of retinal thickening one disc area in size at least part of which was within one disc diameter of the center

* Early Treatment Diabetic Retinopathy Study Research Group. Grading diabetic retinopathy from stereoscopic color fundus photographs--an extension of the modified Airlie House classification. ETDRS report number 10. Ophthalmology 1991;98:786-806.

Adapted from the Early Treatment Diabetic Retinopathy Study Research Group. Early Treatment Diabetic Retinopathy Study design and baseline patient characteristics. ETDRS report number 7. Ophthalmology 1991;98:742.

Classificazione dell'edema maculare diabetico

INTERNATIONAL CLINICAL DIABETIC MACULAR EDEMA DISEASE SEVERITY SCALE

Proposed Disease Severity Level	Findings Observable upon Dilated Ophthalmoscopy
Diabetic macular edema apparently absent	No apparent retinal thickening or hard exudates in posterior pole
Diabetic macular edema apparently present	Some apparent retinal thickening or hard exudates in posterior pole

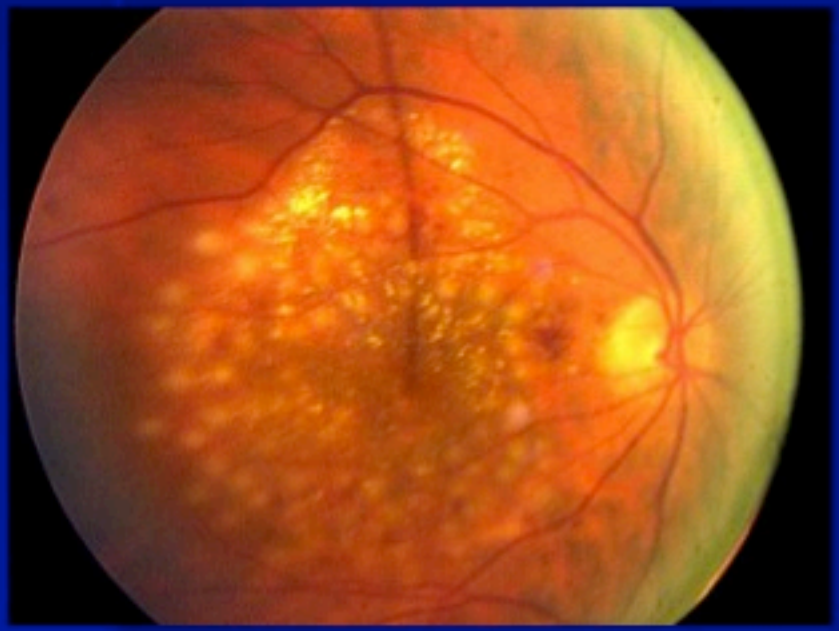
If diabetic macular edema is present, it can be categorized as follows:

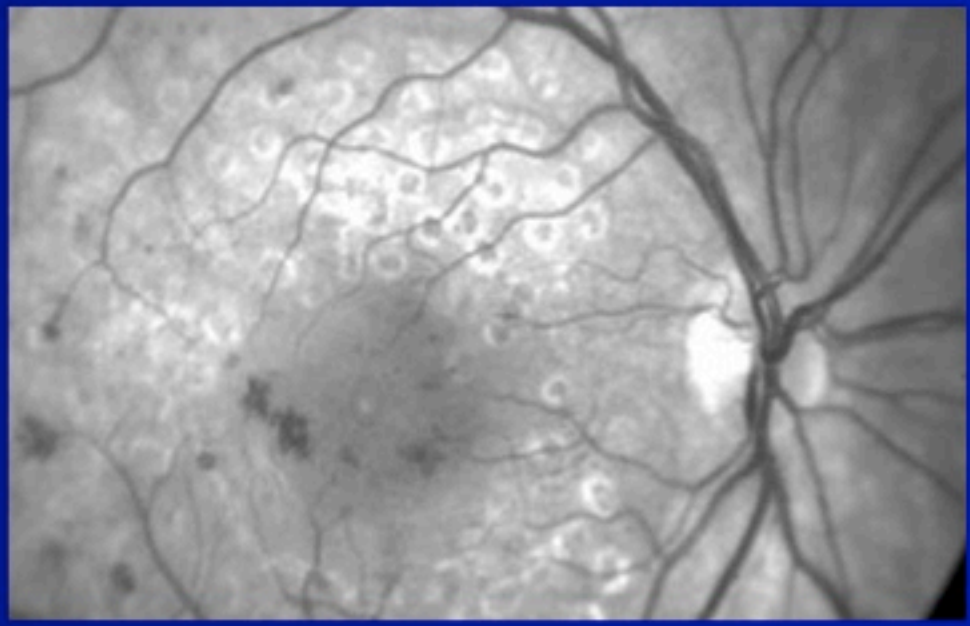
Proposed Disease Severity Level	Findings Observable upon Dilated Ophthalmoscopy*
Diabetic macular edema present	• Mild diabetic macular edema: some retinal thickening or hard exudates in posterior pole but distant from the center of the macula • Moderate diabetic macular edema: retinal thickening or hard exudates approaching the center of the macula but not involving the center • Severe diabetic macular edema: retinal thickening or hard exudates involving the center of the macula

* Hard exudates are a sign of current or previous macular edema. Diabetic macular edema is defined as retinal thickening; this requires a three-dimensional assessment that is best performed by dilated examination using slit-lamp biomicroscopy and/or stereoscopic fundus photography.

Reproduced with permission from Wilkinson CP, Ferris FL III, Klein RE, et al. Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. Ophthalmology 2003;110:1680.

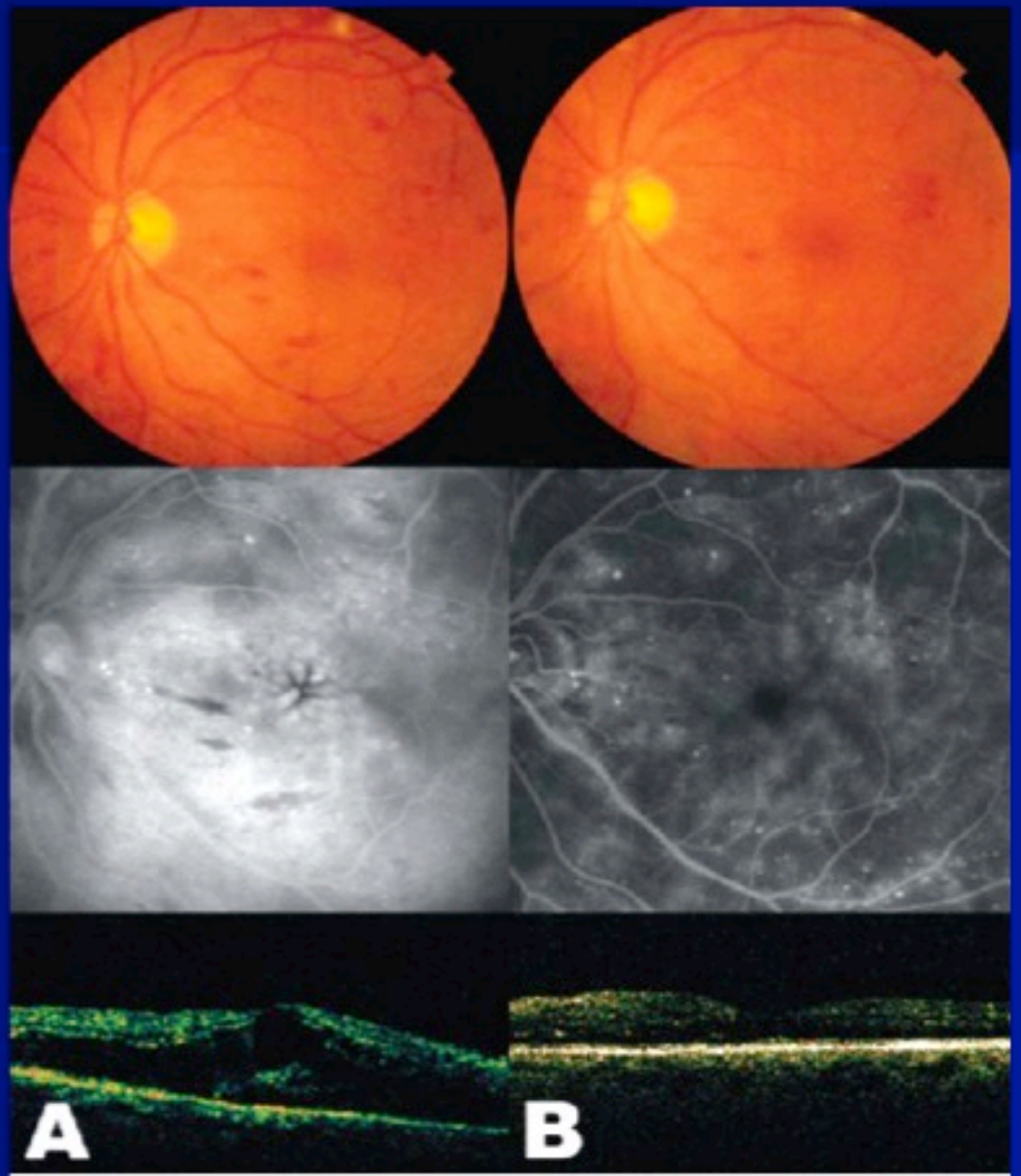
Laser maculare: Edema Maculare Diffuso





Retinopatia diabetica con EMC

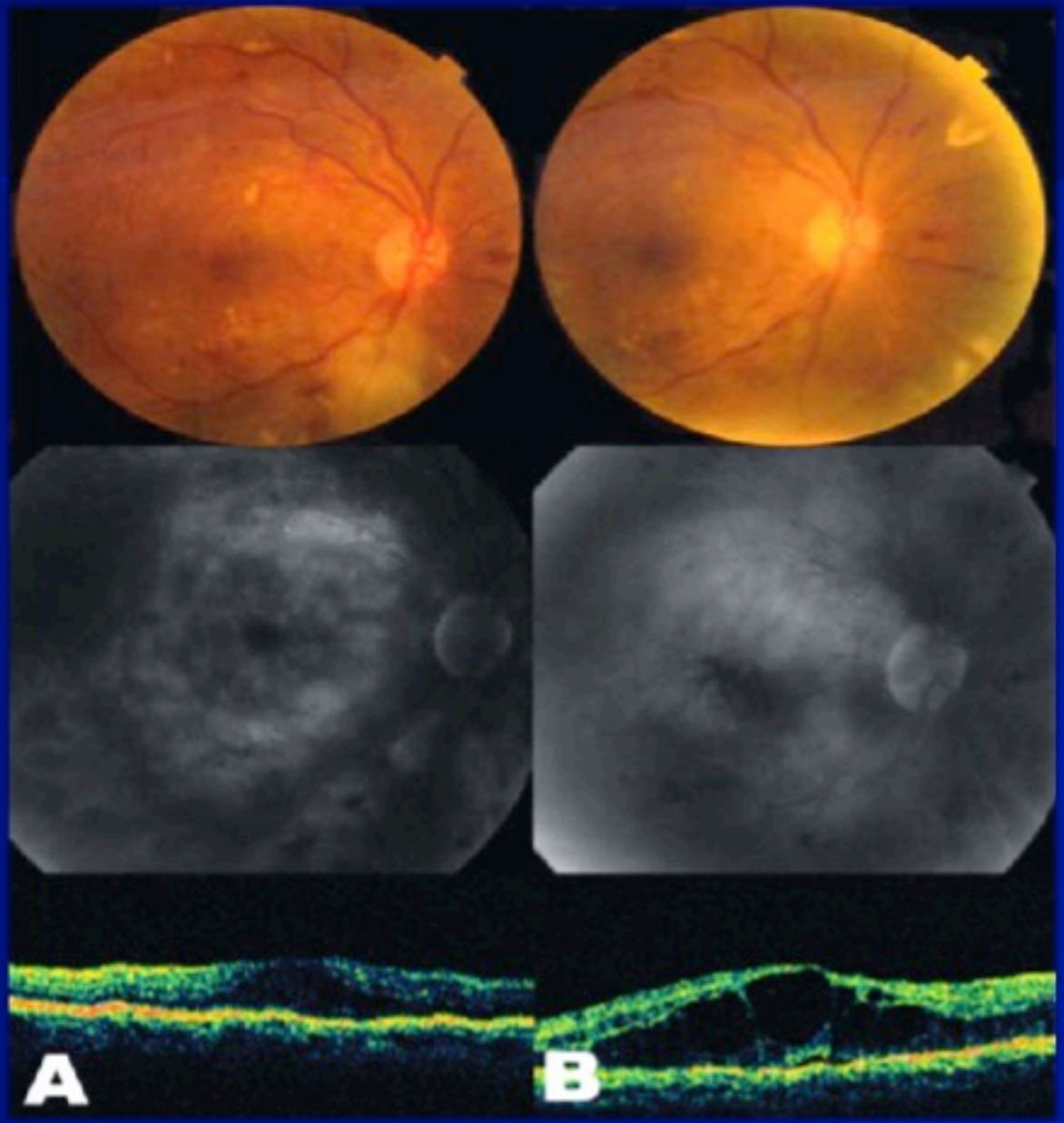
Pre-laser



Post-laser
1 mese

Retinopatia diabetica con EMC

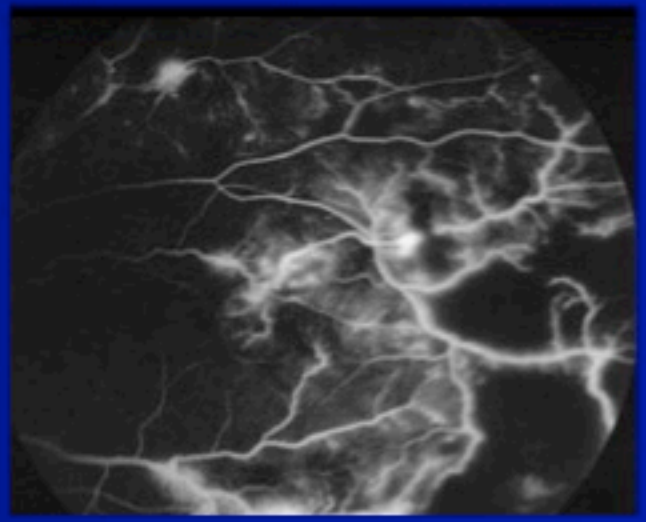
Post-laser
1 mese



Pre-laser

Quando è indicato il laser nella **Retinopatia diabetica pre-proliferante**

- Trattamento delle aree ischemiche se superano un'estensione di 10 diametri papillari



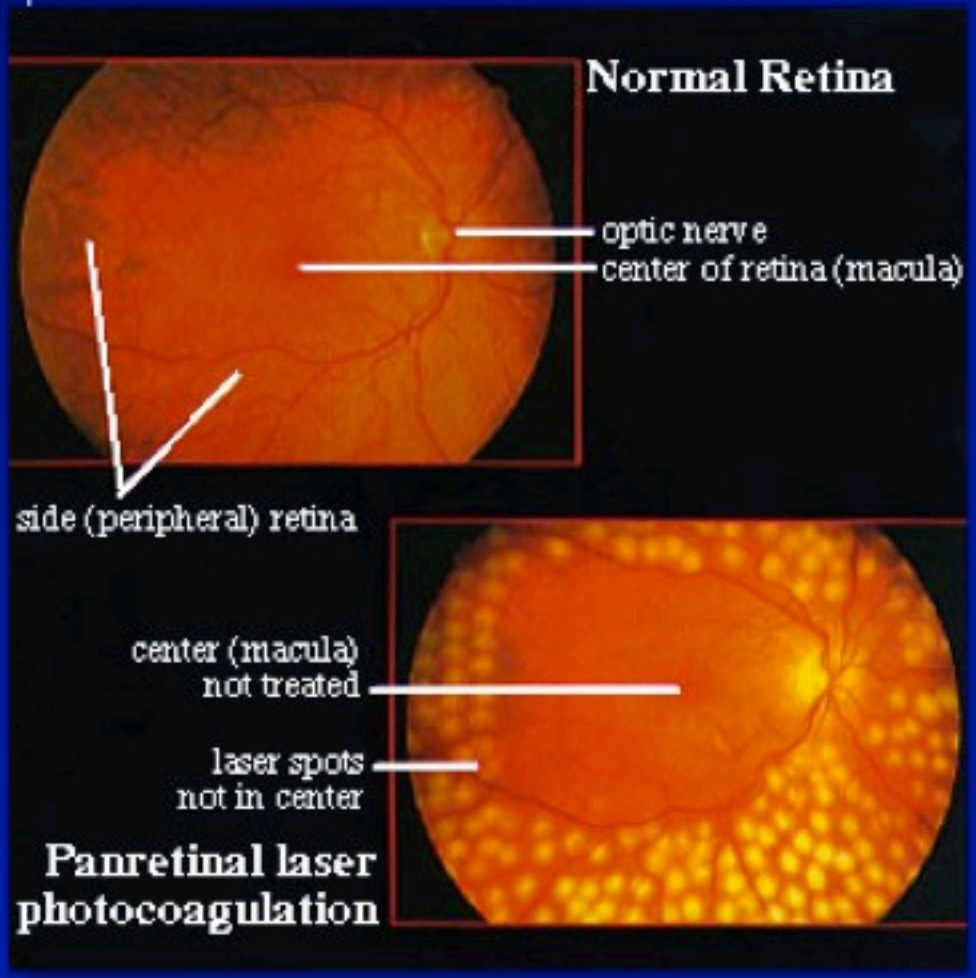
Quando è indicato il laser nella Retinopatia diabetica proliferante

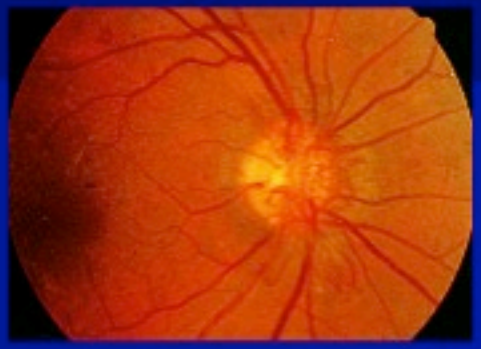
- **Stadio proliferativo preretinico e prepapillare**: TT. le aree di ischemia
- **Neovasi ed ischemia estesa**: fotocoagulazione panretinica
- **Persistenza di neovasi nonostante panretinica**: trattamento diretto, "attento" dei neovasi (possono sanguinare)
- **Coesiste glaucoma neovascolare**: fotocoagulazione panretinica

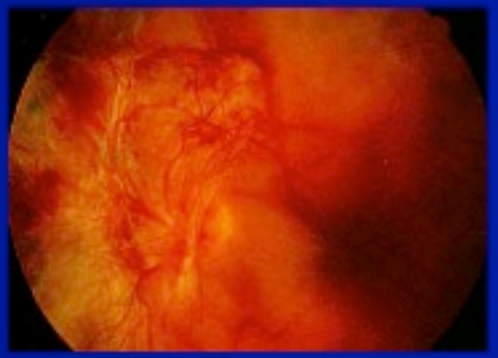
Retinopatia diabetica: La fotocoagulazione panretinica

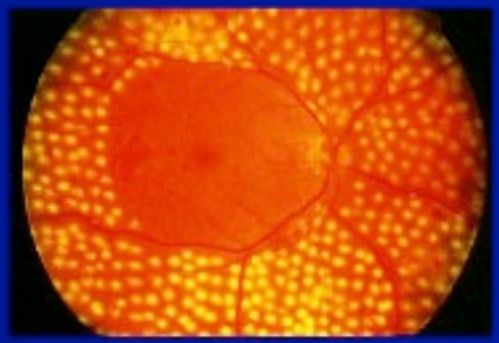
- **MINIMA**: 1200 spots laser in 2 sedute
- **MODERATA**: 2000 spots contigui ma non confluenti in 3-4 sedute
- **INTENSA**: 2000-3000 spots confluenti rispettando il polo posteriore in 6-8 sedute
  - Dimensioni spots: 250-500µ;
  - Tempo di esposizione : 0,2-0,5 sec.
  - Potenza mW necessari allo sbiancamento

Retinopatia diabetica: La fotocoagulazione panretinica

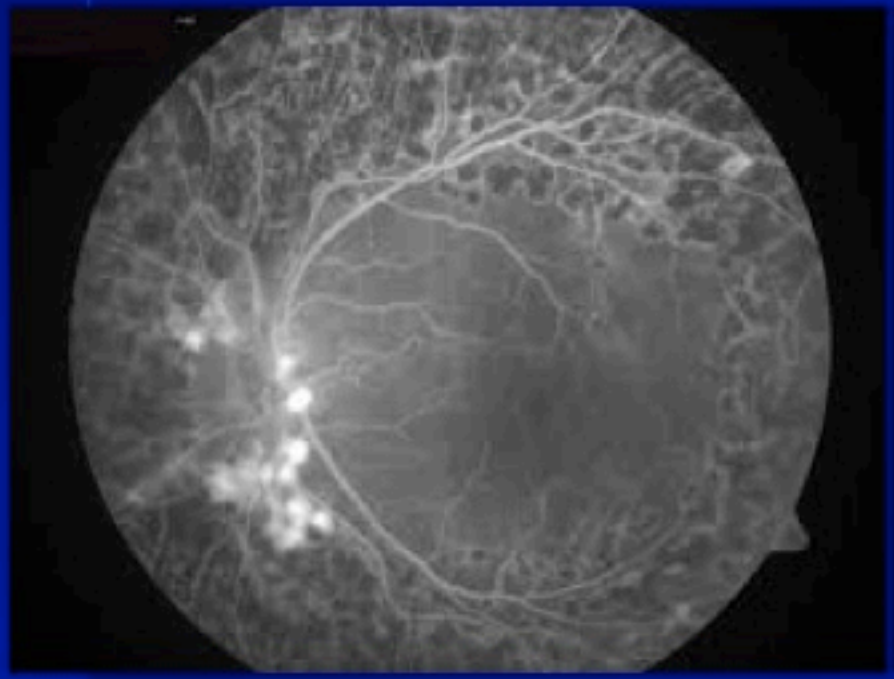




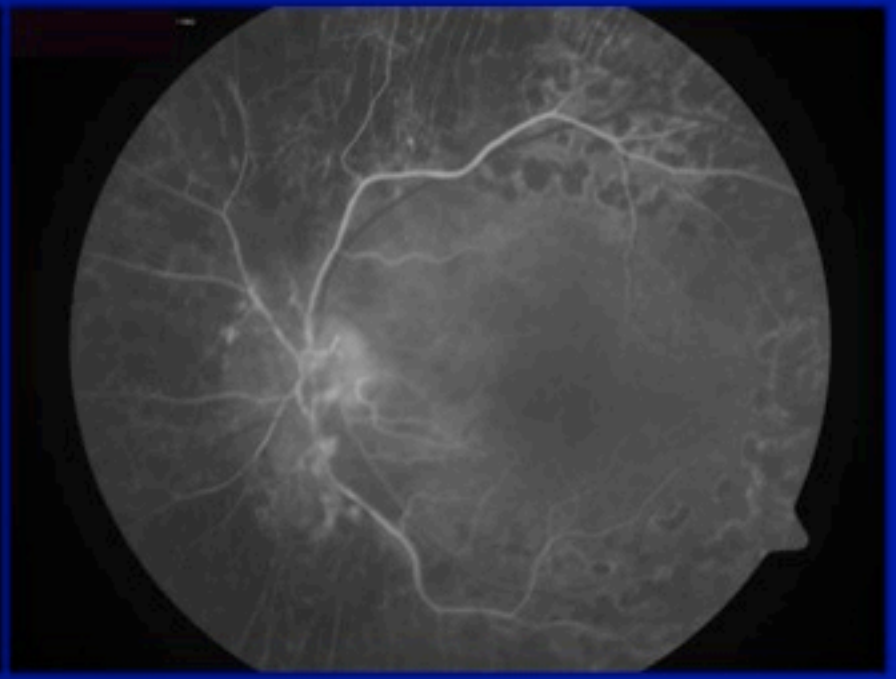




Retinopatia diabetica: La fotocoagulazione panretinica



Post-laser
1 mese



Post-laser
3 mesi

Follow Up del diabetico

Recommended Eye Examination Schedule for Patients with Diabetes Mellitus

Diabetes Type	Recommended Time of First Examination	Recommended Follow-up*
Type 1	3-5 years after diagnosis[15] [A:II]	Yearly[15] [A:II]
Type 2	At time of diagnosis[19,69] [A:II]	Yearly[19,69] [A:II]
Prior to pregnancy (type 1 or type 2)	Prior to conception and early in the first trimester[70-72] [A:I]	No retinopathy to mild or moderate NPDR: every 3–12 months[70-72] [A:I] Severe NPDR or worse: every 1–3 months[70-72] [A:I]

NPDR = nonproliferative diabetic retinopathy

* Abnormal findings may dictate more frequent follow-up examinations.

La gestione oculistica del paziente diabetico

MANAGEMENT RECOMMENDATIONS FOR PATIENTS WITH DIABETES

Severity of Retinopathy	Presence of CSME*	Follow-up (Months)	Panretinal Photocoagulation (Scatter) Laser	Fluorescein Angiography	Focal and/or Grid Laser†
Normal or minimal NPDR	No	12	No	No	No
Mild to moderate NPDR	No	6-12	No	No	No
	Yes	2-4	No	Usually	Usually*‡
Severe NPDR	No	2-4	Sometimes§	Rarely	No
	Yes	2-4	Sometimes§	Usually	Usually‖
Non-high-risk PDR	No	2-4	Sometimes§	Rarely	No
	Yes	2-4	Sometimes§	Usually	Usually‡
High-risk PDR	No	2-4	Usually	Rarely	No
	Yes	2-4	Usually	Usually	Usually‖
Inactive/involuted PDR	No	6-12	No	No	Usually
	Yes	2-4	No	Usually	Usually

CSME = clinically significant macular edema; NPDR = nonproliferative diabetic retinopathy; PDR = proliferative diabetic retinopathy

Risultati

ETDRS (Early Treatment Diabetic Retinopathy Study1985)

Laser nella Retinopatia diabetica non proliferante (con edema maculare): il 24% degli occhi non fotocoagulati ha perso almeno 2 linee di Snellen contro il 12% di quelli sottoposti a fotocoagulazione

Laser nella Retinopatia diabetica proliferante la fotocoagulazione panretinica ha ridotto la progressione della RD nel 50 % degli occhi trattati con spots confluenti.

Conclusioni

RD SEMPLICE :

1. **ESSUDATI CIRCINNATI**: TT focale delle lesioni microvascolari al centro della corona di essudati;
2. **EDEMA RETINICO LOCALIZZATO**: TT a griglia delle aree edematose;
3. **EDEMA RETINICO DIFFUSO**: TT a griglia del polo posteriore + TT focale dei punti di diffusione
4. **EDEMA MACULARE CISTOIDE**: TT a griglia della macula

RD PRE-PROLIFERANTE :

1. **AREE ISCHEMICHE > DI 10 DP**: TT delle aree ischemiche ;

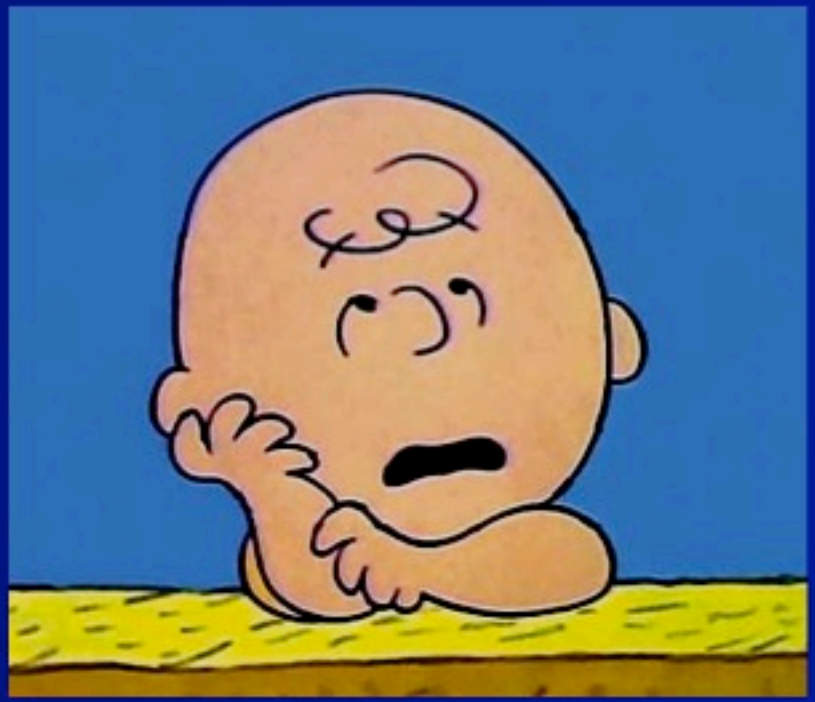
RD PROLIFERANTE :

1. **PROLIFERAZIONE PRERETINICA E PREPAPILLARE**: TT delle aree ischemiche ;
2. **NEOVASI ED ISCHEMIA ESTESA**: TT Panretinico

Quindi

La terapia del paziente affetto da retinopatia diabetica ha subito importanti innovazioni nel corso degli ultimi anni con l'avvento dei farmaci anti-Vegf e con il perfezionamento delle tecniche di chirurgia vitreo-retinica. Tuttavia, il trattamento laser rappresenta ancora oggi un momento terapeutico importante e talora imprescindibile nella gestione oftalmica della retinopatia diabetica.

GRAZIE



Domanda per crediti ECM

I neovasi della retina e/o del disco ottico, proliferazioni fibrovascolari, emorragie vitreali, distacchi retinici parcellari trazionali sono alterazioni tipiche di:

1. Retinopatia diabetica semplice
2. Retinopatia diabetica preproliferante
3. Retinopatia diabetica proliferante
4. Non sono alterazioni legate al diabete