

# Retinopexy

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- Aim of retinopexy

The indent from the explant closes retinal breaks, but retinopexy is required to produce an **enduring bond** between the retina and the retinal pigment epithelium that will persist even if the indent disappears

- Types of retinopexy

- Diathermy
- Cryopexy
- Diopexy (transscleral diode)

# Diathermy

## With scleral dissection

Generation of radiofrequency current that is converted to heat in absorbing tissue causing chorioretinal adhesion

### Diathermy is rarely used nowadays :

- Scleral shrinkage and necrosis
- Elevated IOP due to scleral shrinkage
- Weakening and extensive choroidal destruction,
- Choroidal hemorrhage, retinal hemorrhage, retinal hole



**Cryopexy**

# Cryopexy

## Transscleral

- How it works
- How to apply
- Time to form retinal adhesion
- Disadvantages
- Avoid

- **How it works**

nitrous oxide (boiling point =  $-88.5^{\circ}\text{C}$ ), or solid carbon dioxide (melting point =  $-79^{\circ}\text{C}$ )

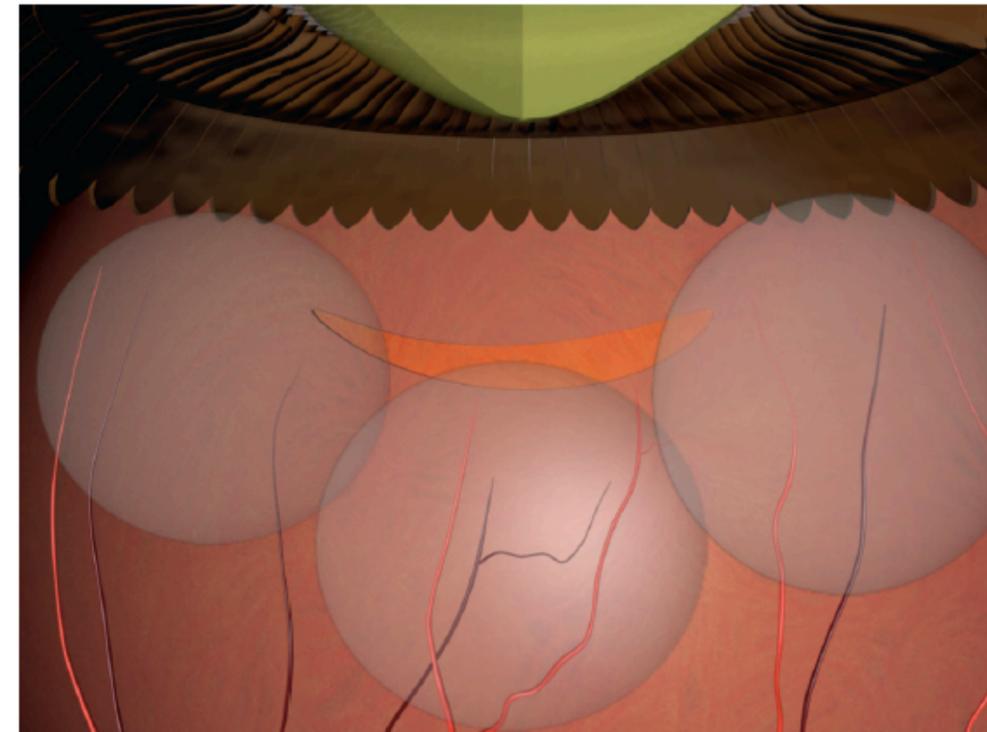
**Ice crystal** formation inside cells leading to cell wall rupture, **denaturing of lipid- protein** complexes, osmotic stress, tissue necrosis, cellular apoptosis after freezing injury, and the buildup of toxic concentrations of solutes inside cells

# Cryopexy

- How to apply

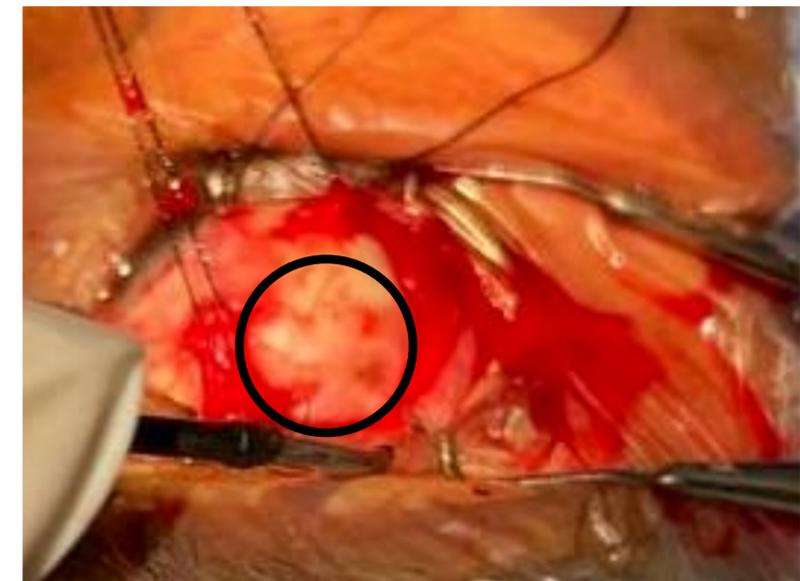
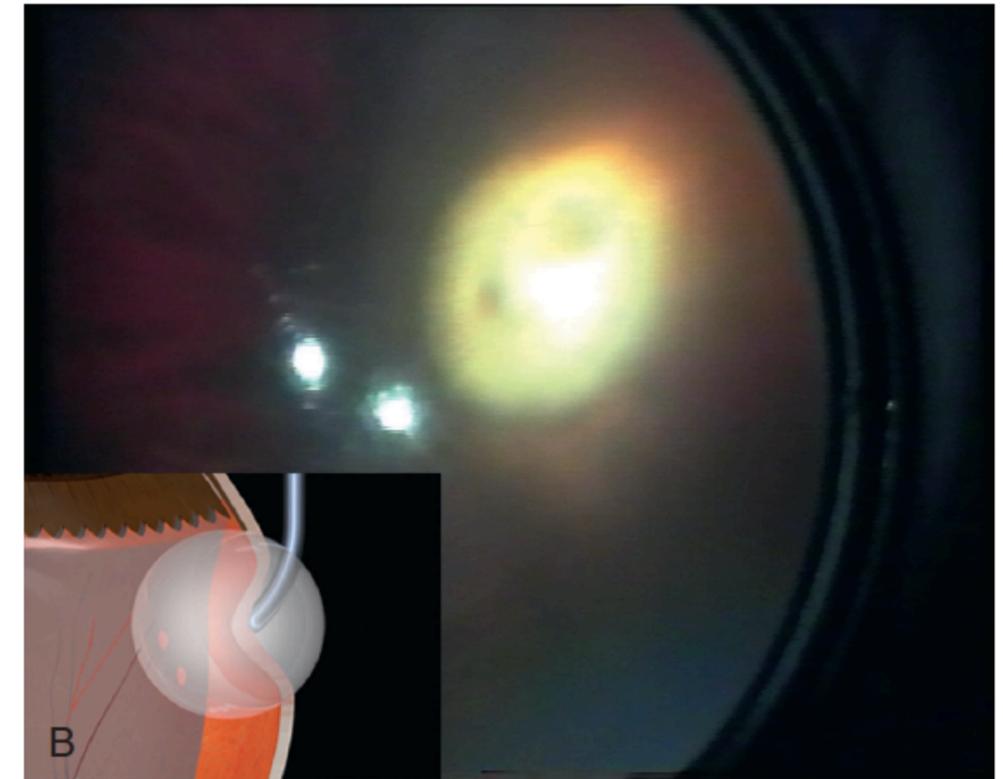
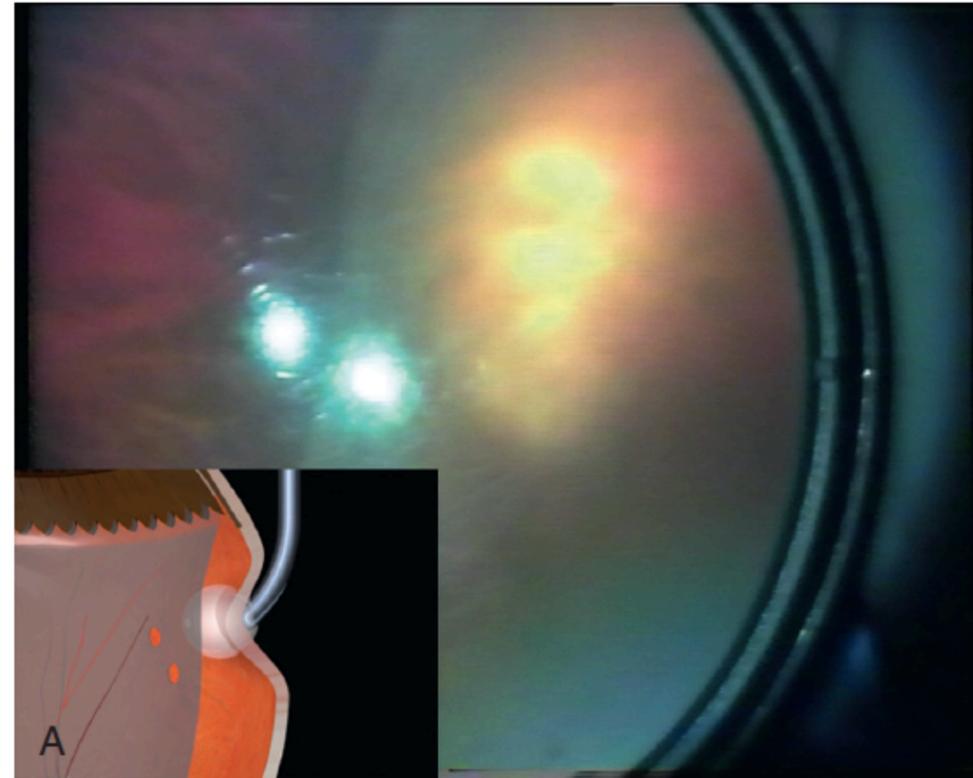


- How it works
- How to apply
- Time to form retinal adhesion
- Disadvantages
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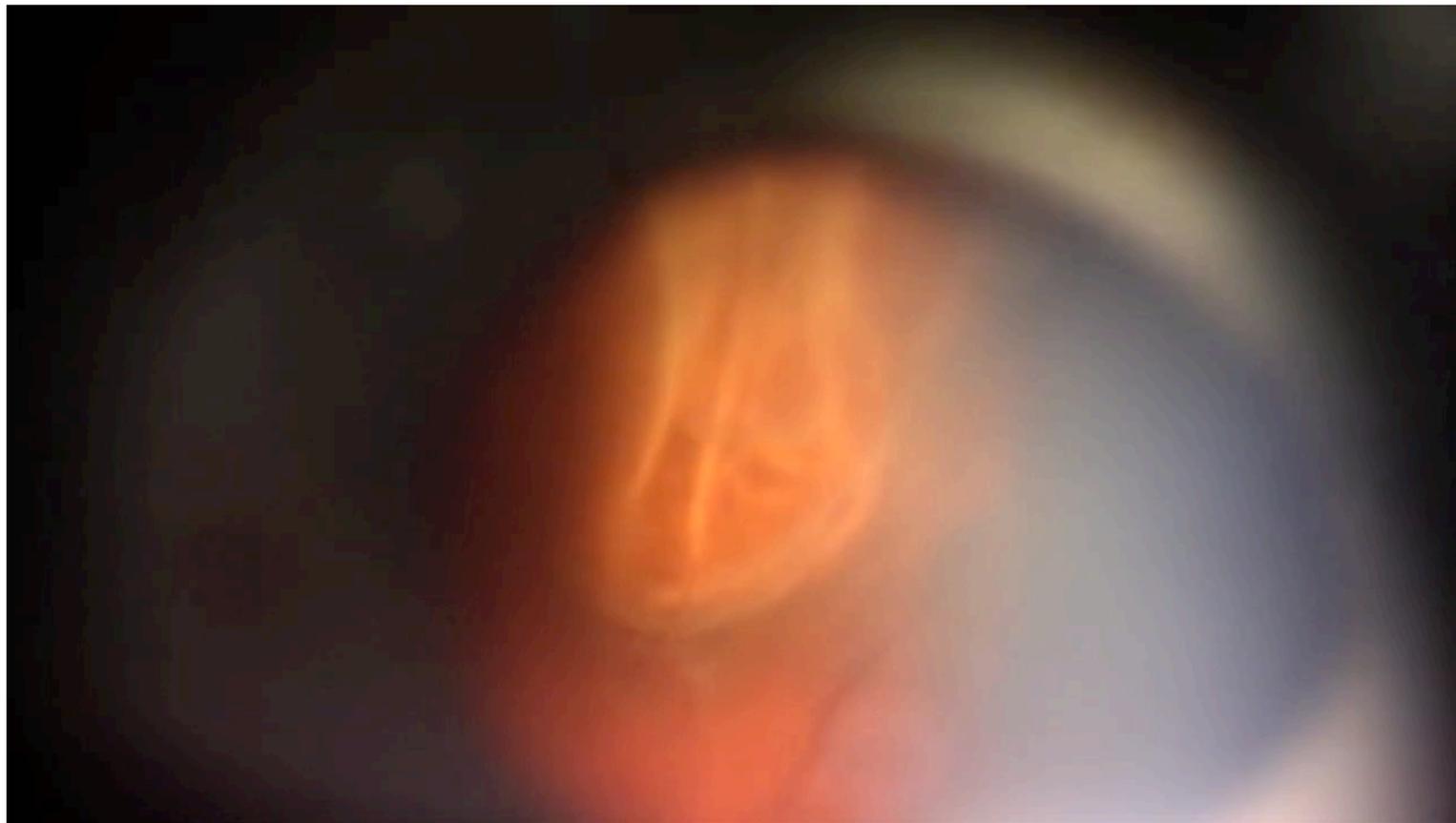
# Cryopexy

- How to apply



# Cryopexy

- Cryo reaction



DACE

# Cryopexy

- Time to form retinal adhesion

The reaction starts between 2 and 7 postoperative days, however, firm adhesion occurs between 2-4 weeks

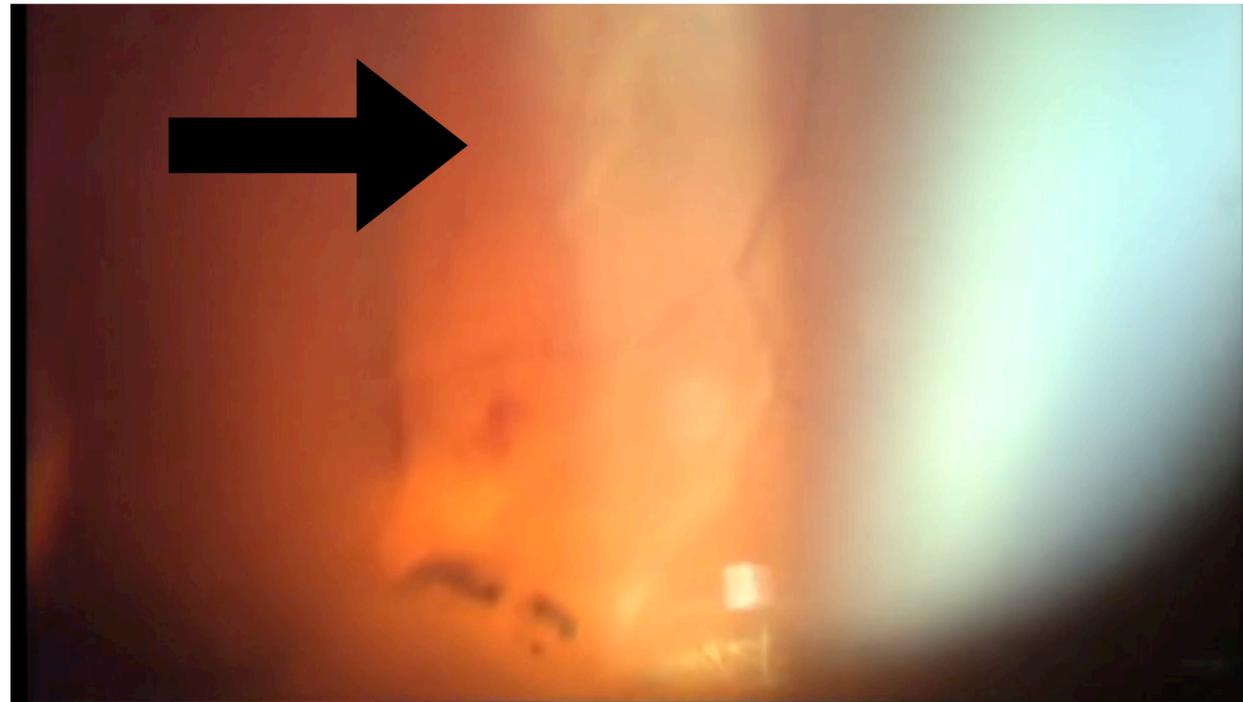
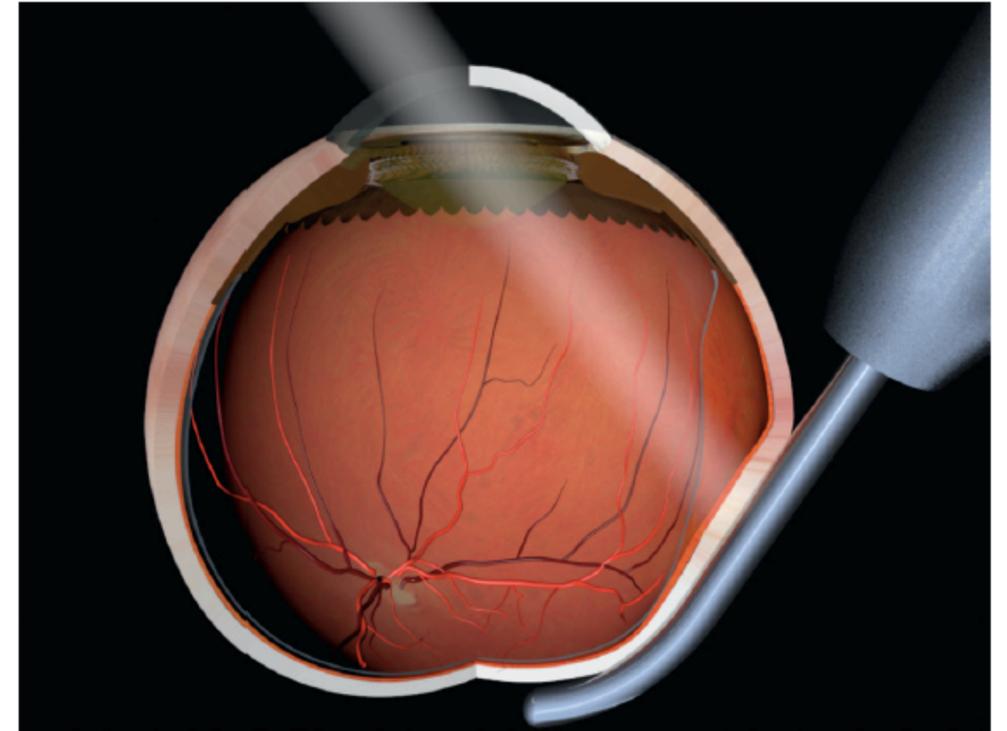
# Cryopexy

- **Disadvantages**

- Difficult for far ~~posterior~~ lesions
- Does not create an immediately **maintained** and easily visible effect;
- **Dispersion** of viable pigment epithelial cells through the retinal break; may be further increased if the same area is retreated — —> PVR & ERM
- Disruption of the **blood-retinal barrier**, with leakage of serum proteins intraocularly causing later cellular migration
- **Delayed chorioretinal adhesions** and not as rapidly clinically effective as those that follow laser treatment

# Cryopexy

- **Avoid**
  - Refreezing / Freezing the bed of large tear
  - Shaft indentation



# Trans Scleral Diode

# Diopexy

**Transscleral diode laser**

## **- How it works**

810 infrared laser causing protein denaturation and adhesion through trans-scleral application

# Diopexy

## Transscleral diode laser

### - How it works

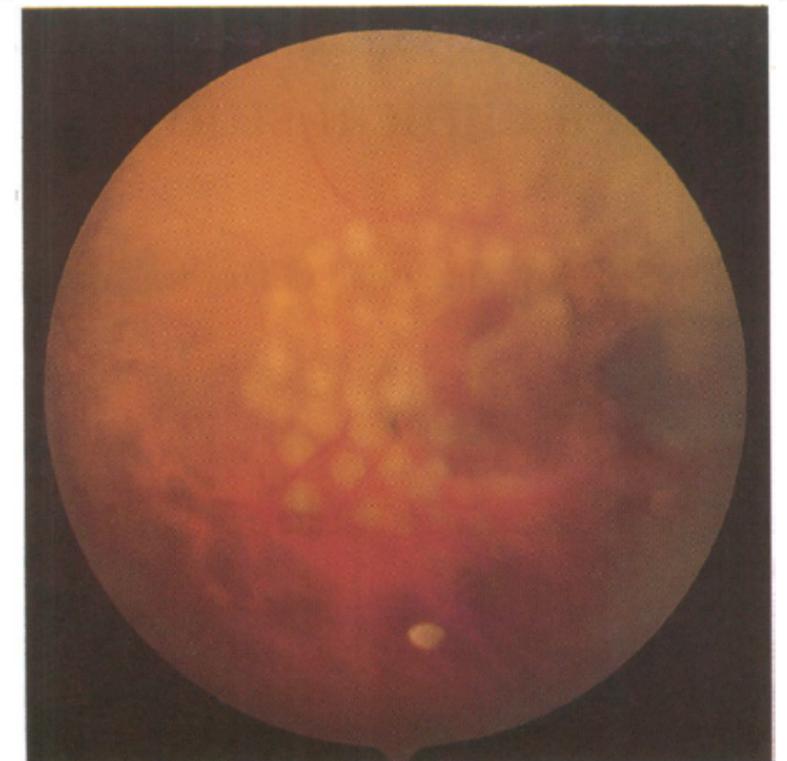
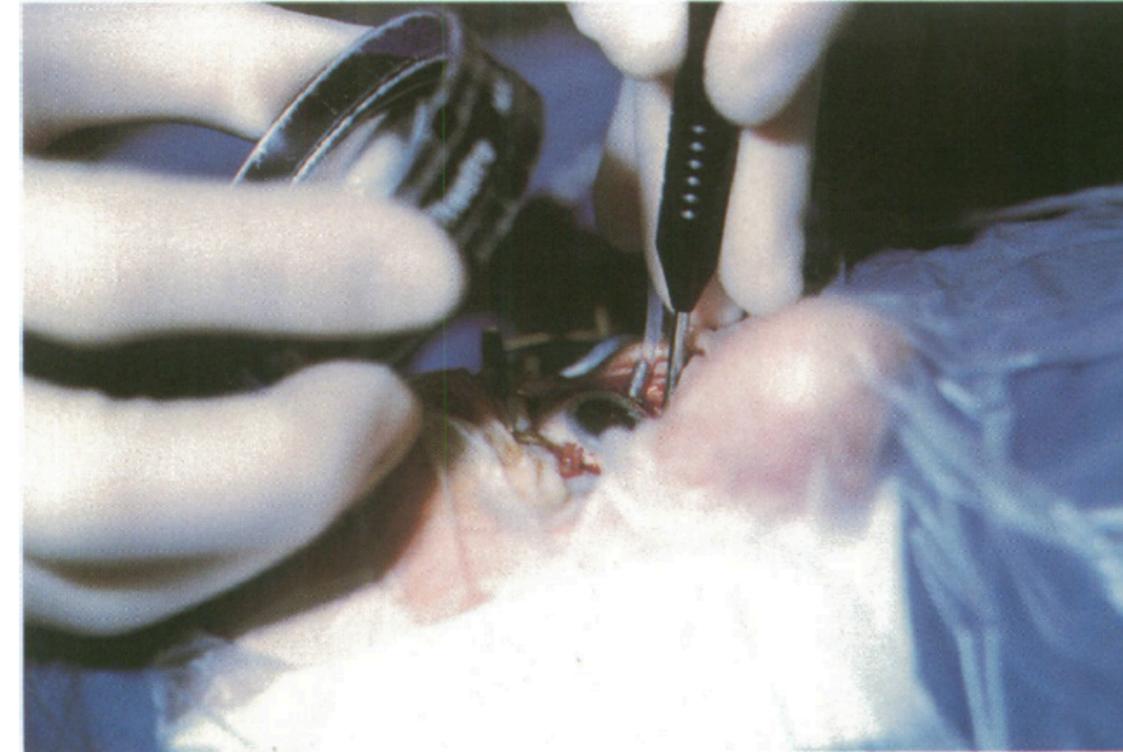
810 infrared laser causing protein denaturation and adhesion

### - How to apply

Transscleral probe

Red aiming beam around the edges of the break

500 mw for 2 seconds



# Diopexy

## Transscleral diode laser

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### - How to apply

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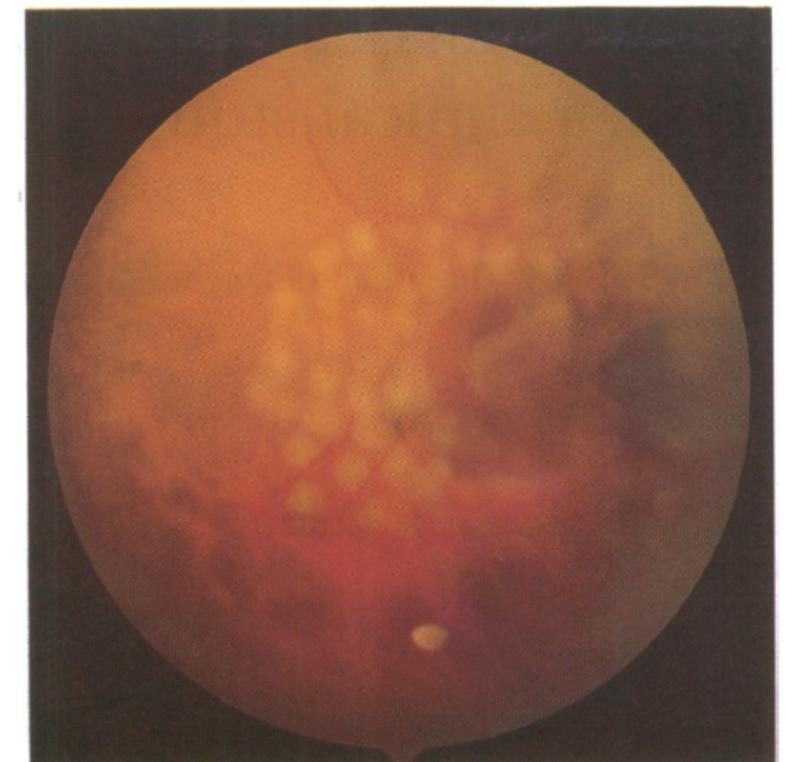
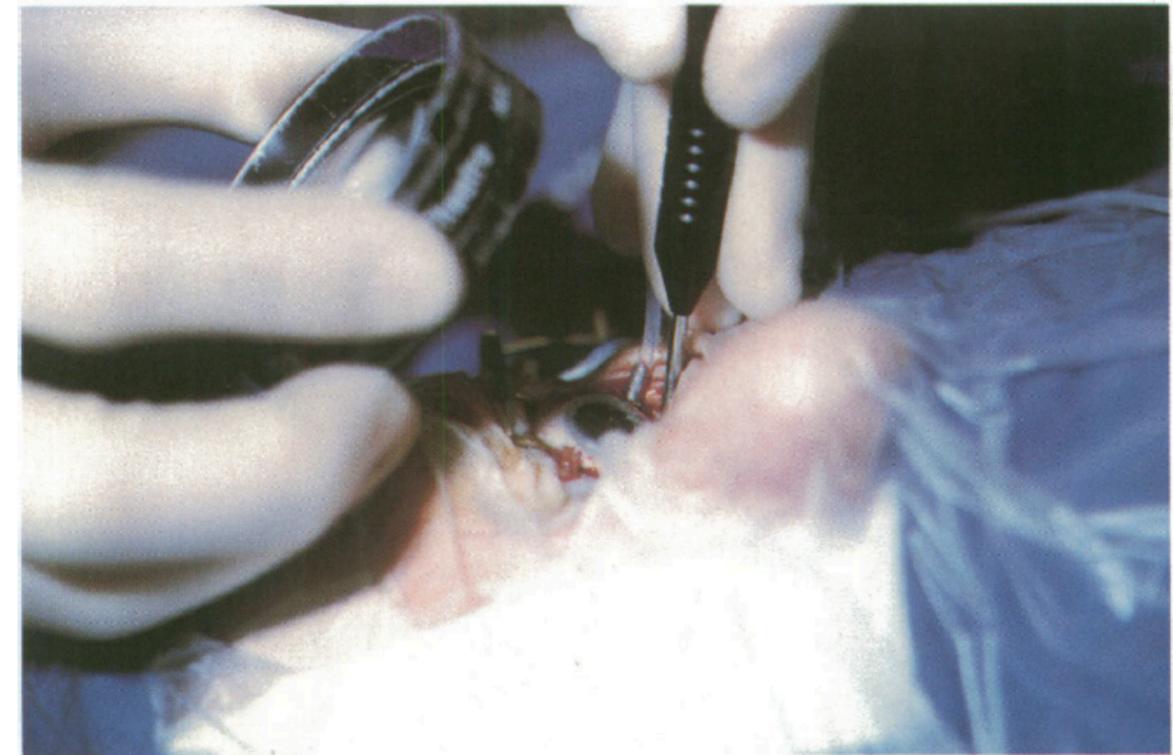
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### - When to apply

Very shallow detachment

SRF drainage for bullous detachment before laser application



# Diopexy

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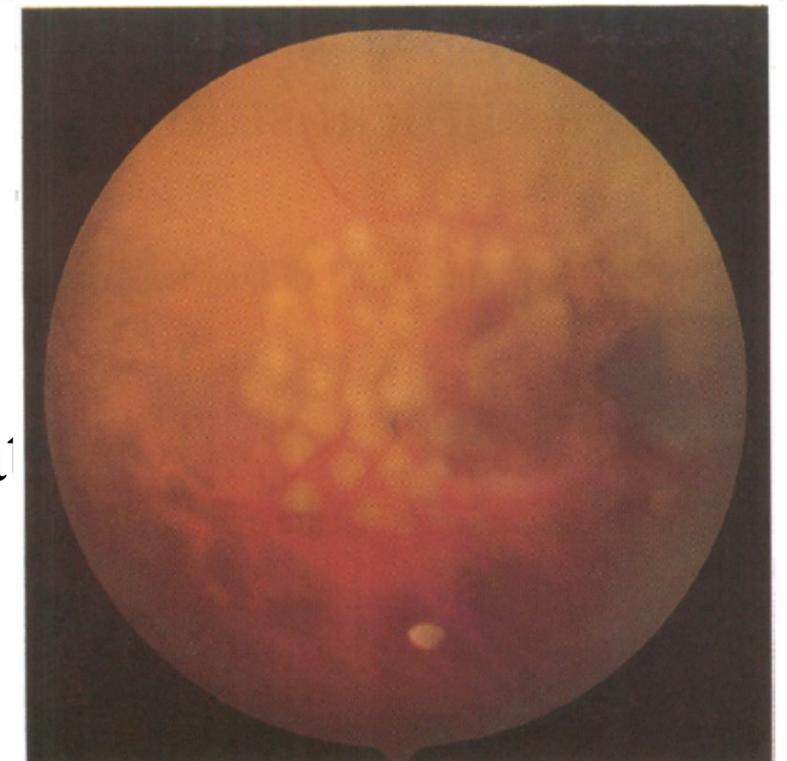
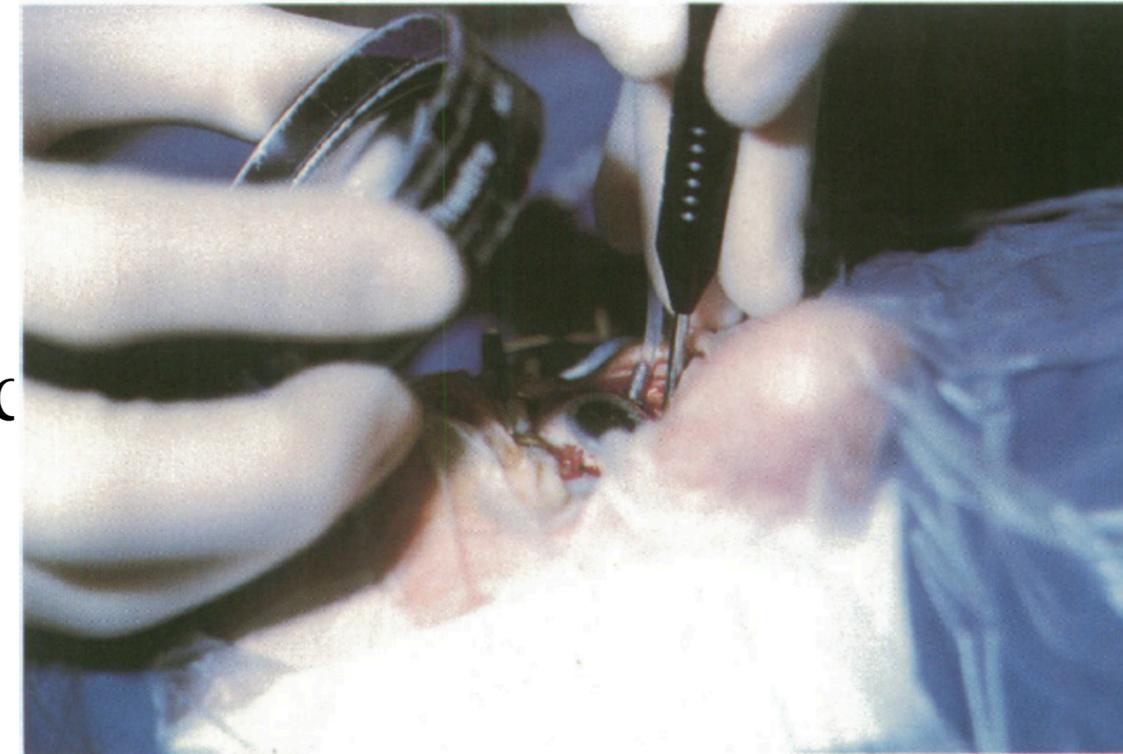
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### - Time to form retinal adhesion

Starts at day 1 and firm adhesion in 2 weeks



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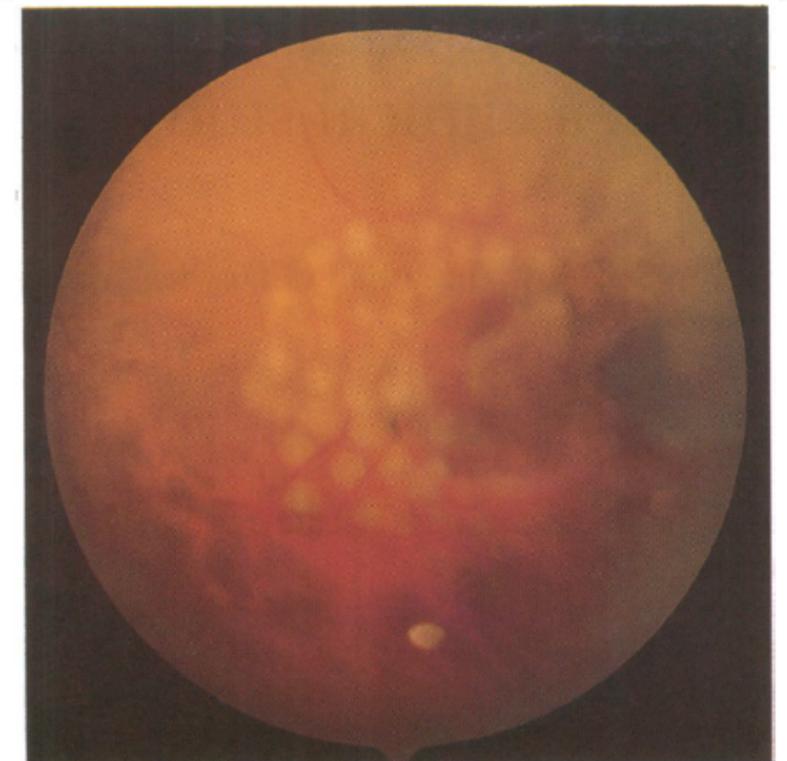
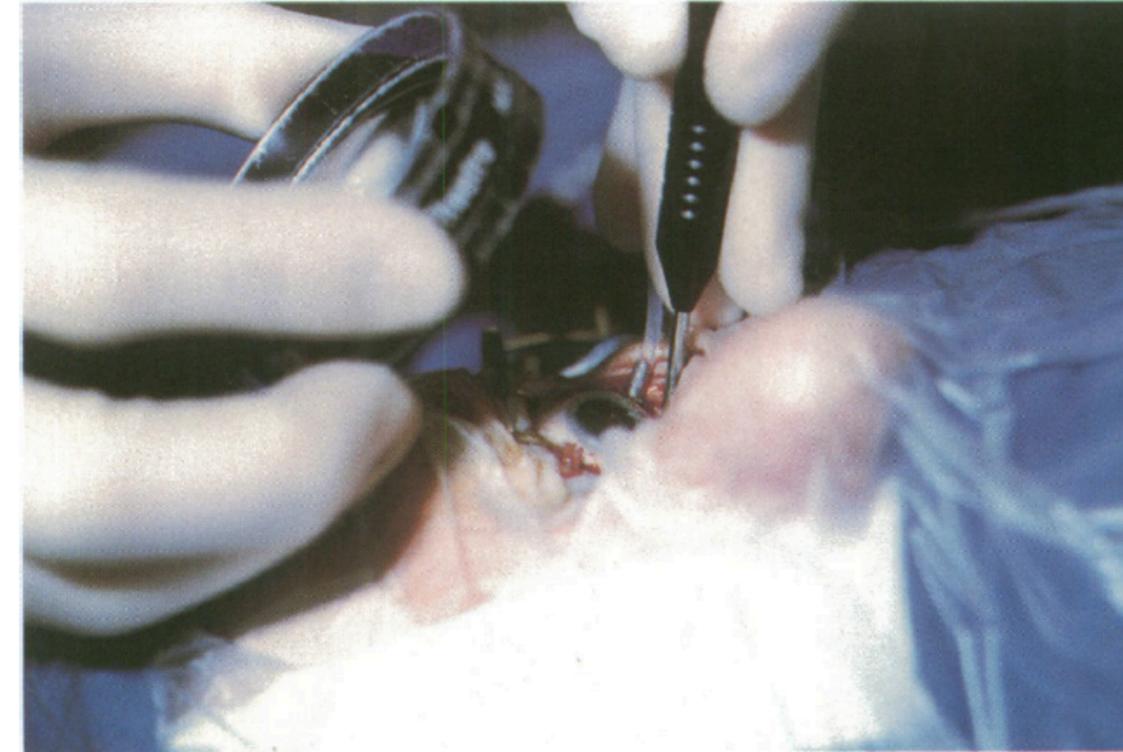
### - Time to form retinal adhesion

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### - Disadvantages

Not suitable for Blond fundus

Scleral thinning with re-treatment



# Selection

Diode	Cryo
<ul style="list-style-type: none"><li>- large/ extensive breaks</li><li>- Tear over scleral buckle (re-treatment)</li></ul>	<ul style="list-style-type: none"><li>- Small breaks</li><li>- Hard to find breaks (Lighting up)</li><li>- Media opacity</li><li>- Blond fundus or pigment atrophy</li></ul>



## A randomized controlled study of the use of transscleral diode laser and cryotherapy in the management of rhegmatogenous retinal detachment

D H Steel <sup>1</sup>, J West, W G Campbell

- Purpose: prospective randomized study to compare the results and complication rates of transscleral **diopexy** with those of **cryopexy** during surgery for rhegmatogenous retinal detachment (**RRD**).
- Conclusion: In this study of patients with uncomplicated RD without significant preoperative PVR, the experimentally shown benefits of transscleral diode laser **did not result in significant improvement** in the results of reattachment surgery compared with cryotherapy.

**Thank you**