XVII CONGRESSO SOC

Presidente del Congresso:
Prof. Giovanni Scorcia

Organizzatori:
Dr. Pasquale Cozzupoli, Dr. Giovanni Spinelli

"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"

Responsabile Scientifico: A. Lucente
27 ottobre 2017, Reggio Calabria

ECOGRAFIA A-SCAN INDICAZIONE E IOL

Prof. Nicola Rosa

INDICAZIONI ECOGRAFIA A SCAN
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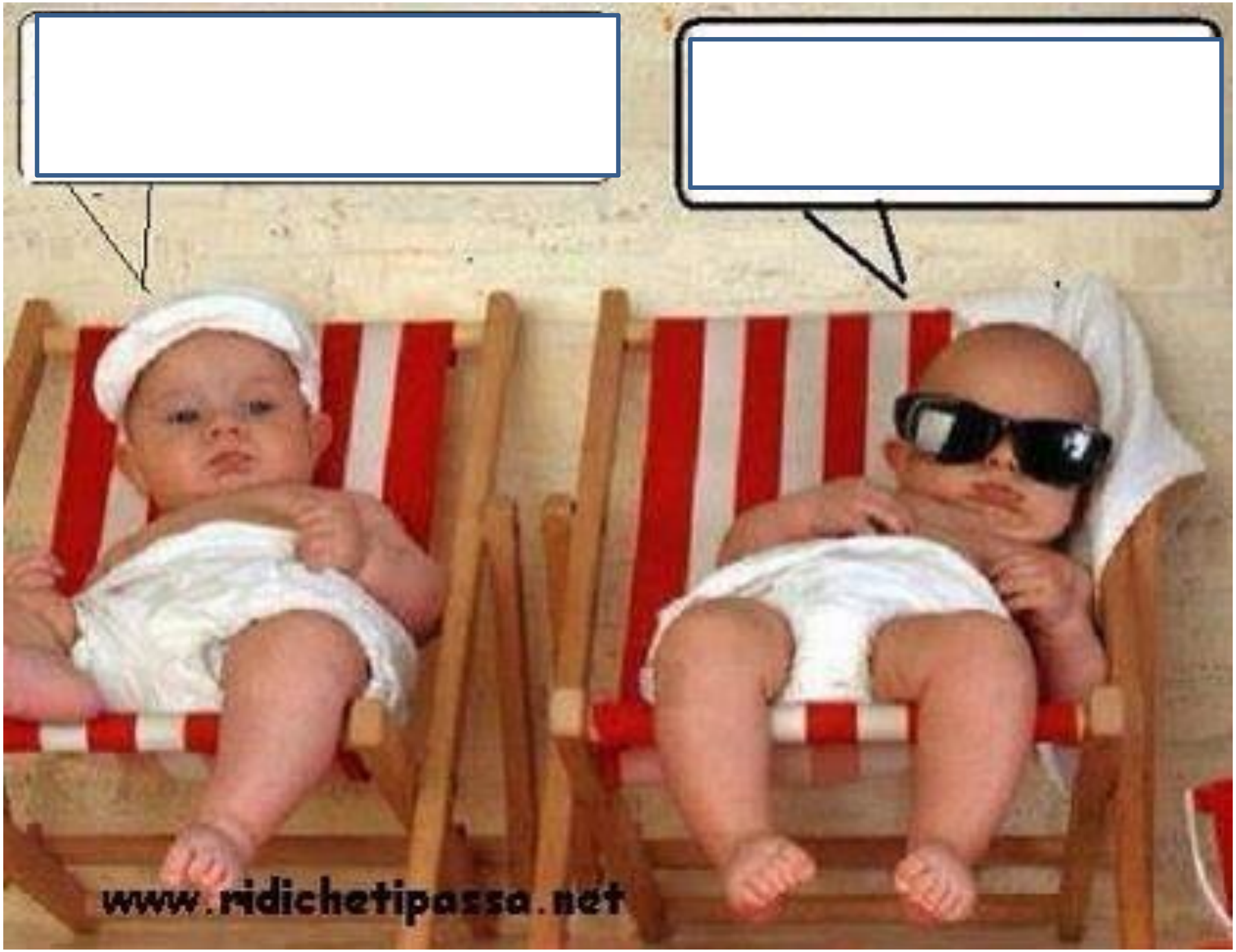
INDICAZIONI DELL'ESAME ECOGRAFICO

"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"



"CORSO AVANZATO
DIAGNOSTICO-CHIRURGICO
DI SEMEIOTICA STRUMENTALE"

"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"

"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"


Nun ce sta nient a fa'...
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... E' muort pascà !!

INDICAZIONI dell’Esame ecografico

Globo

Orbita

Globo

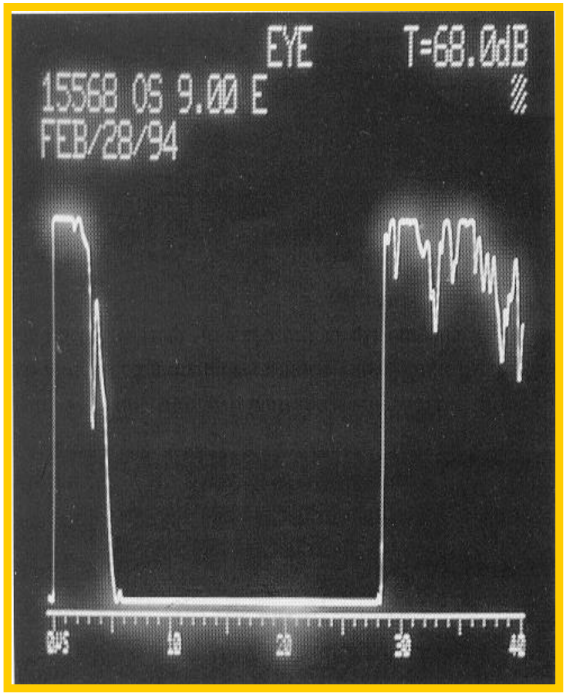
Indicazioni assolute

Opacità dei mezzi diottrici associata a :
-Infiammazione
-Dolore
-Ipertono
-Traumi
-Deficit proiezioni luminose

Tumori segmento posteriore

Indicazioni relative

Cataratta senza altri sintomi
Miosi
Tumori del segmento anteriore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FEB/28/94
0/S
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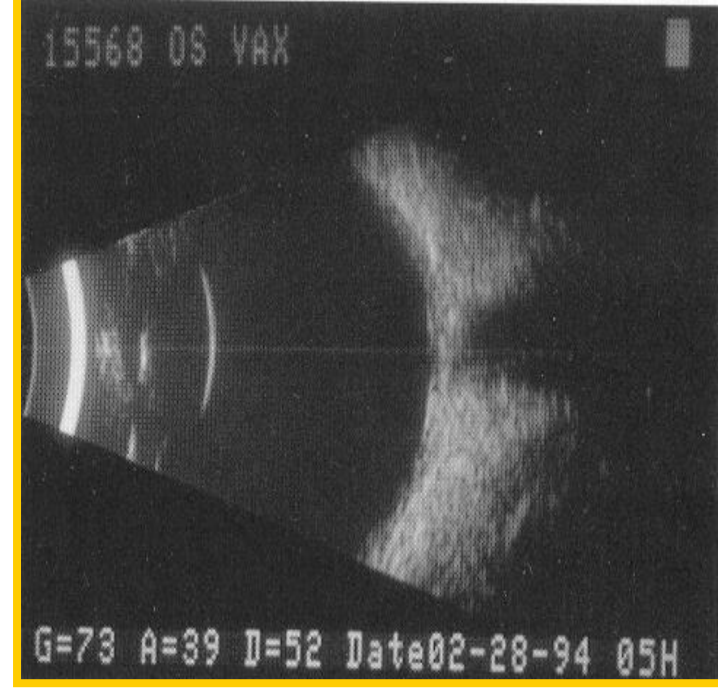
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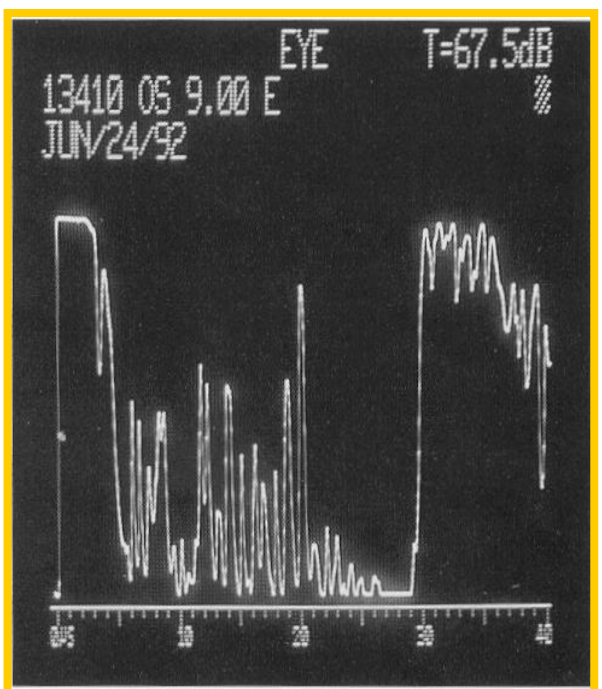
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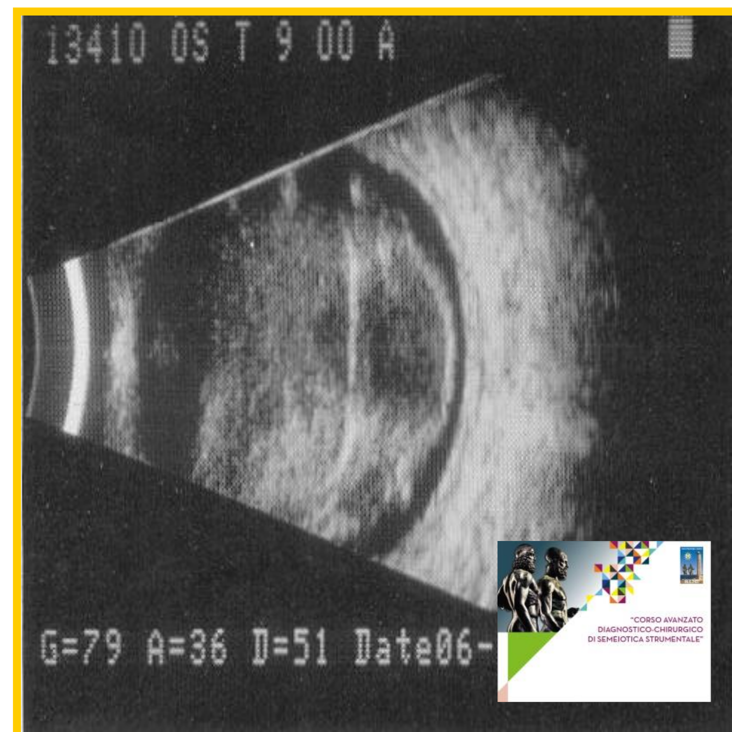
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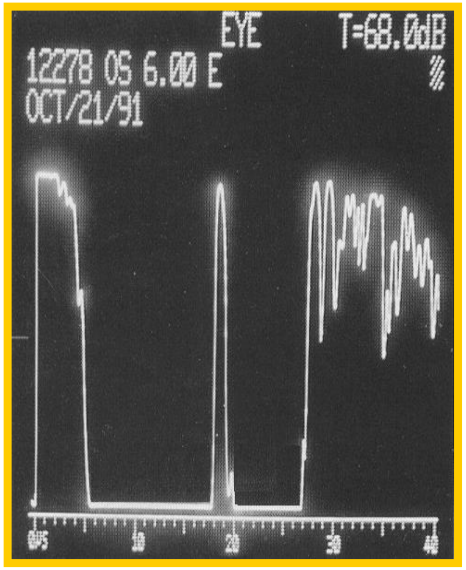
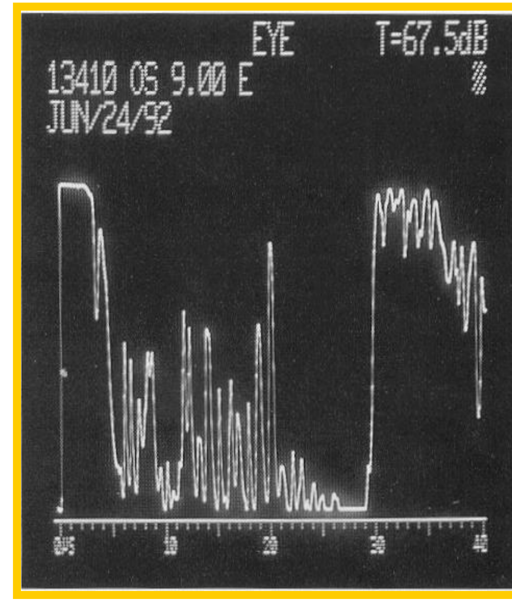
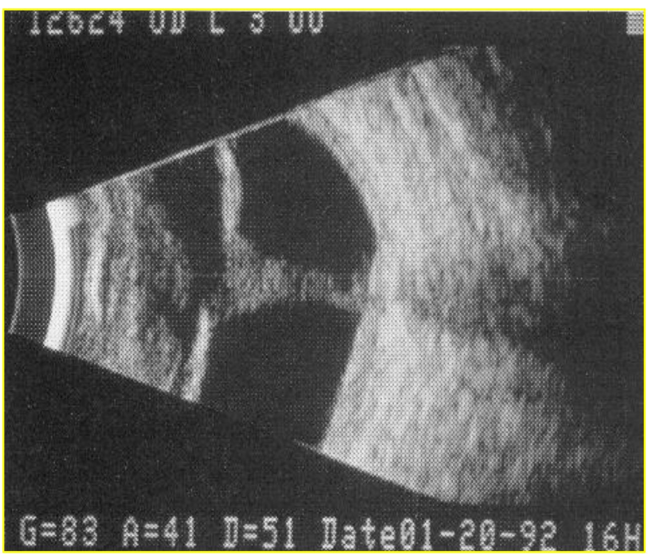
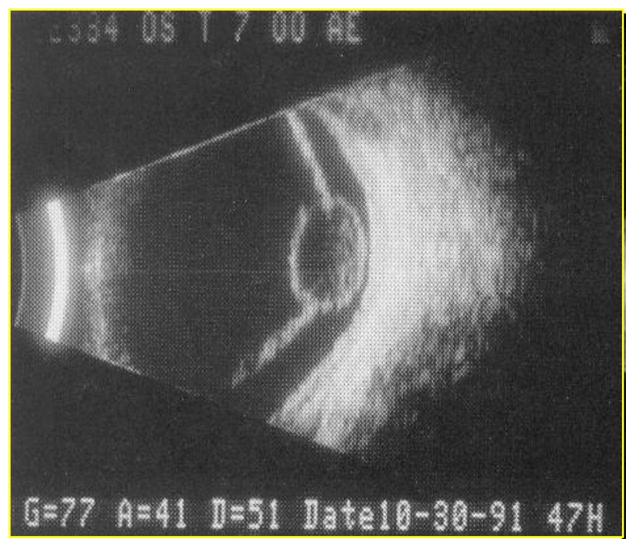
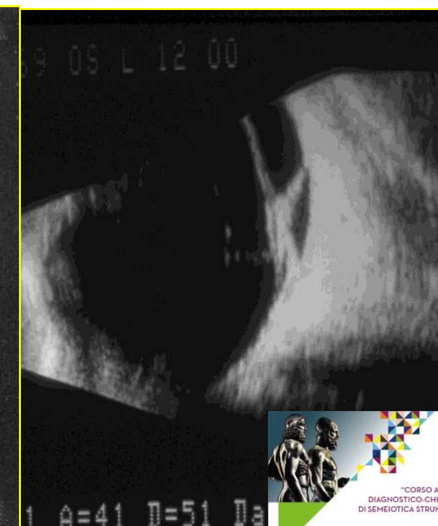
Distacco di retina





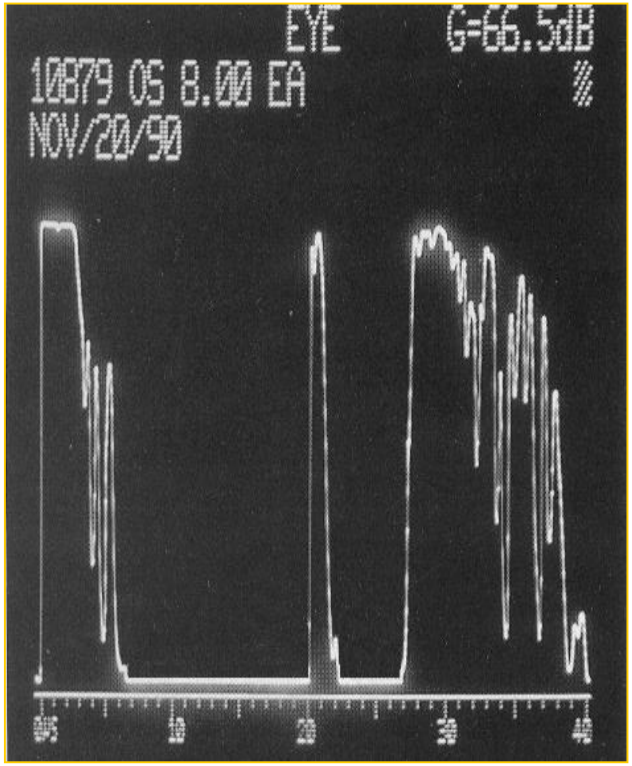




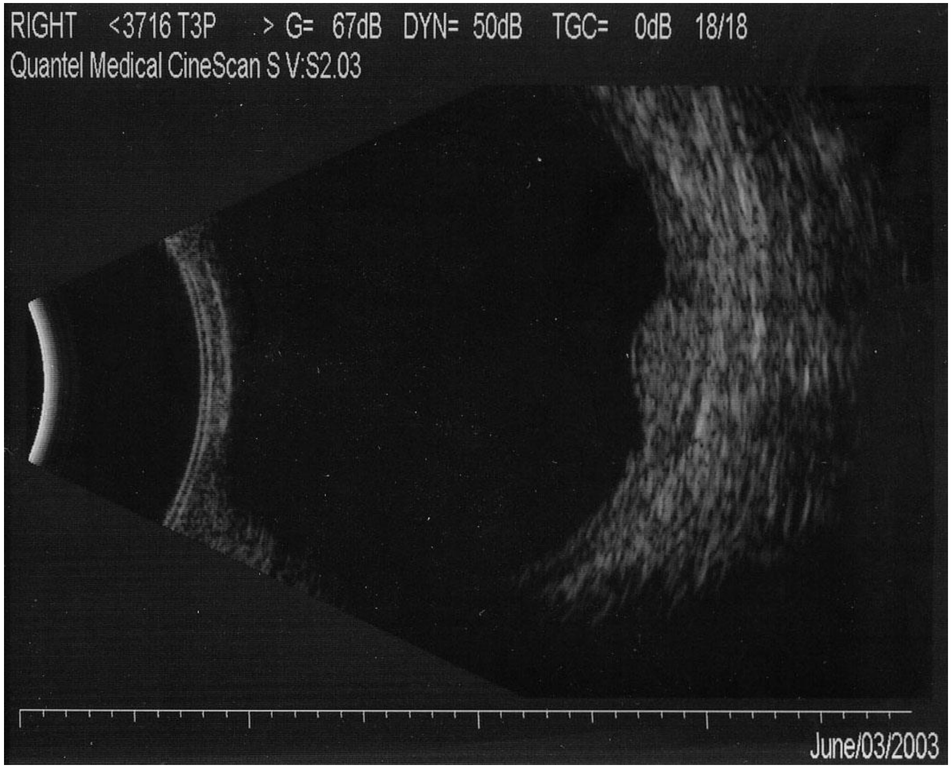


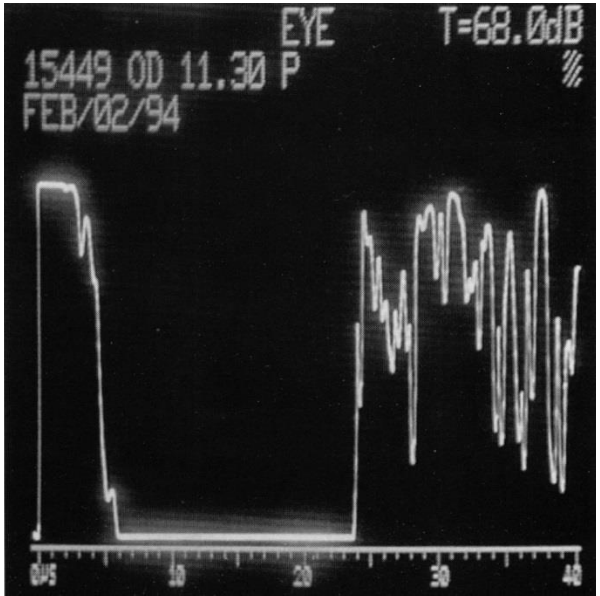
"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"

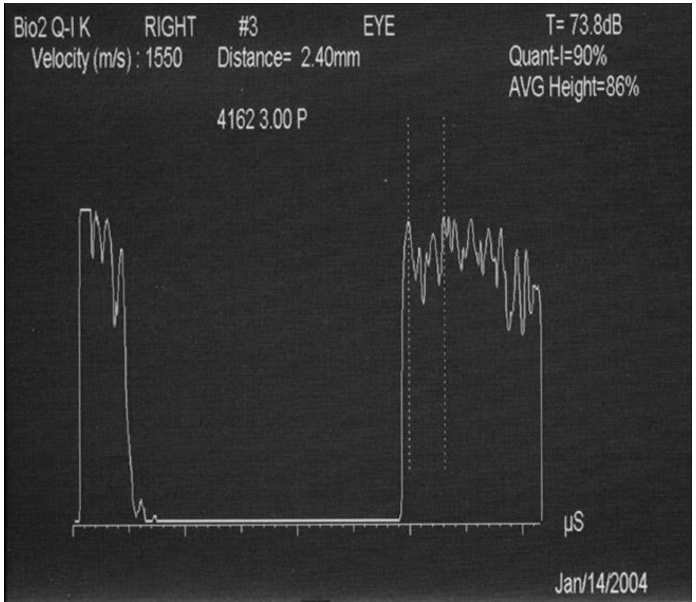
Distacco di coroide

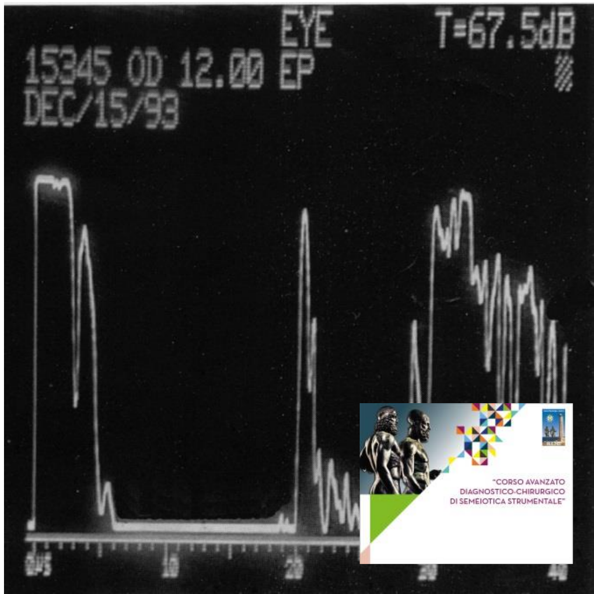


Tumori

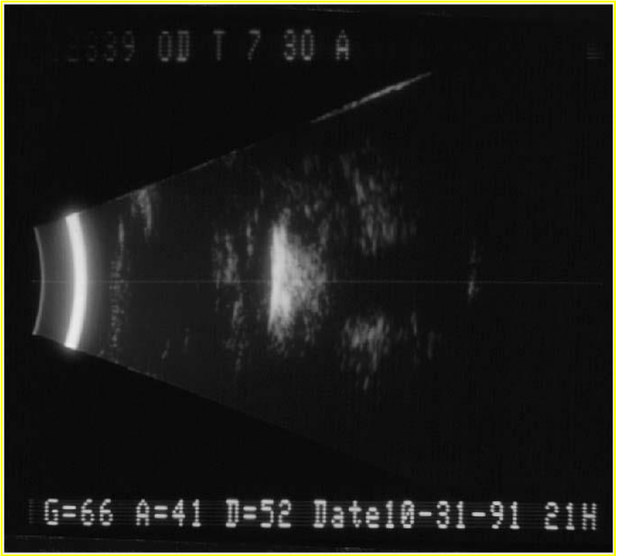








"CORSO AVANZATO DIAGNOSTICO-CHIRURGICO DI SEMEIOTICA STRUMENTALE"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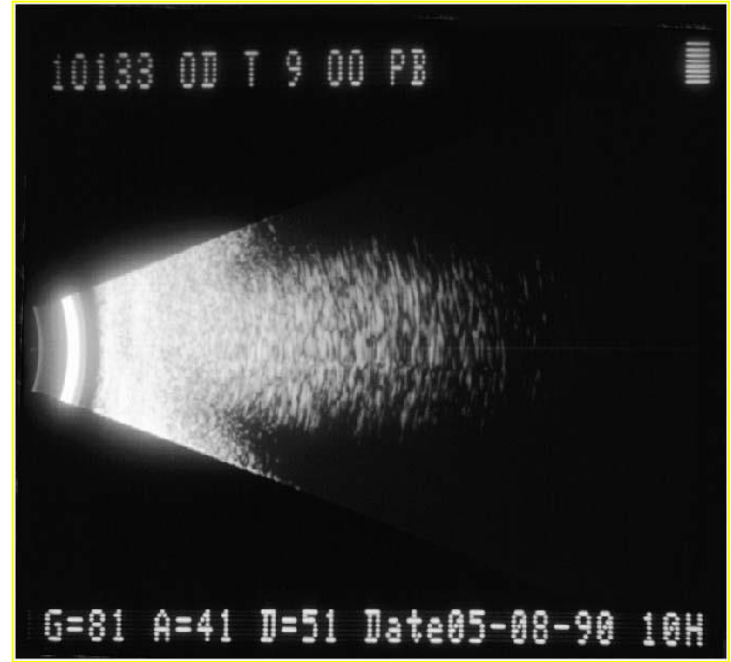
G=66 A=41 D=52 Date10-31-91 21H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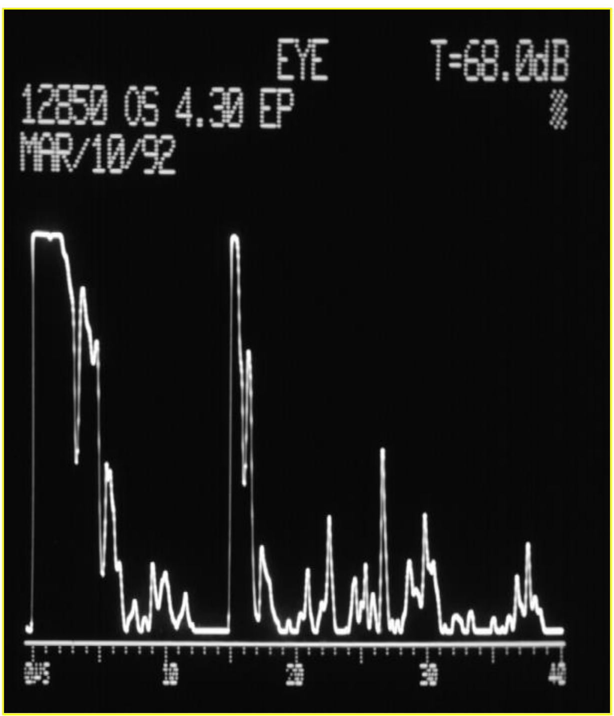
G=81 A=41 D=51 Date05-08-90 10H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MAR/10/92
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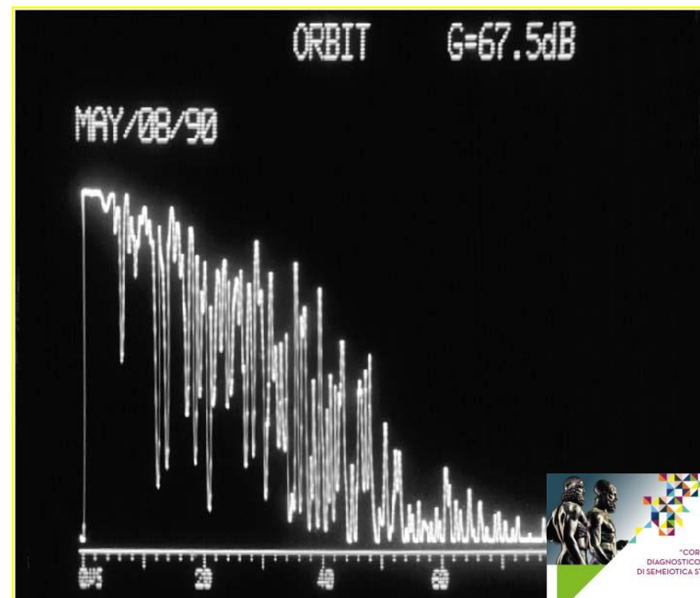
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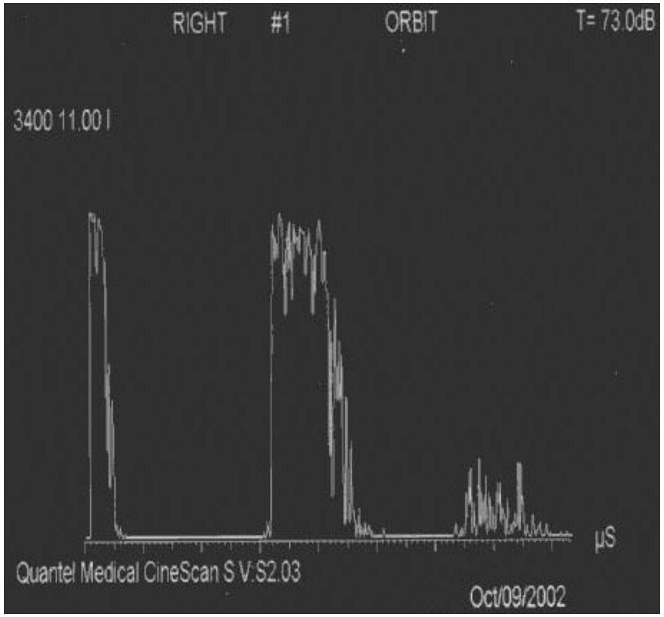
MAY/08/90
20
40
60

INDICAZIONI dell'Esame ecografico Orbita

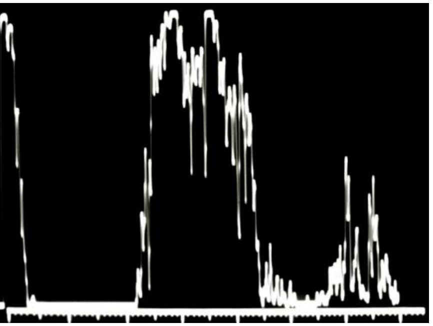


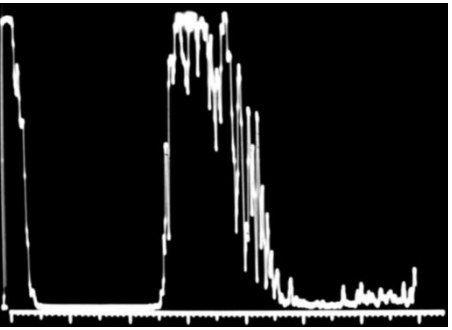
Qualsiasi segno o sintomo che suggerisca la possibilità di una lesione orbitaria
Sospetta ipertensione endocranica

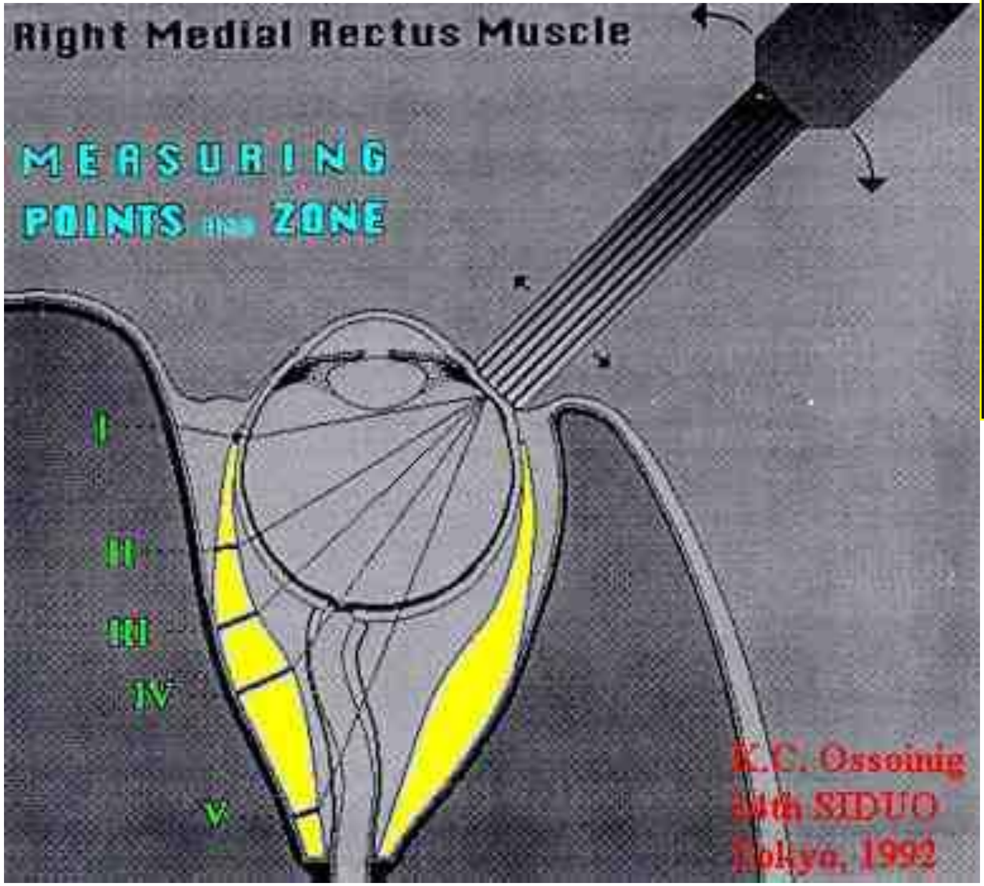
PATOLOGIE MUSCOLARI

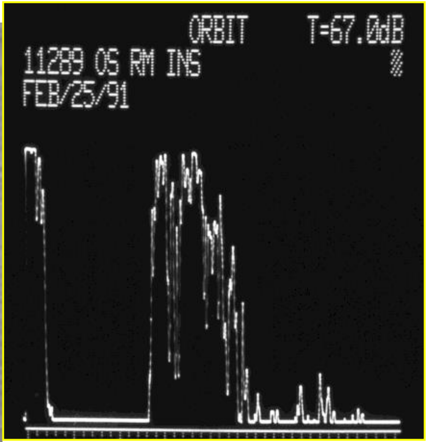
Graves

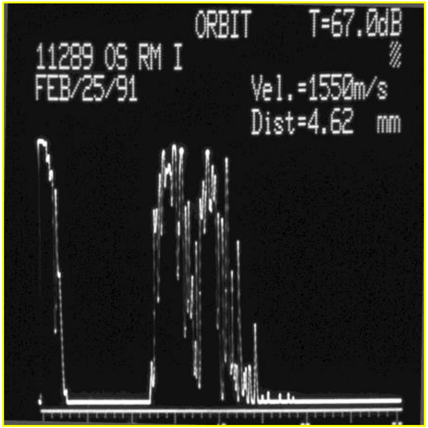
Miosite

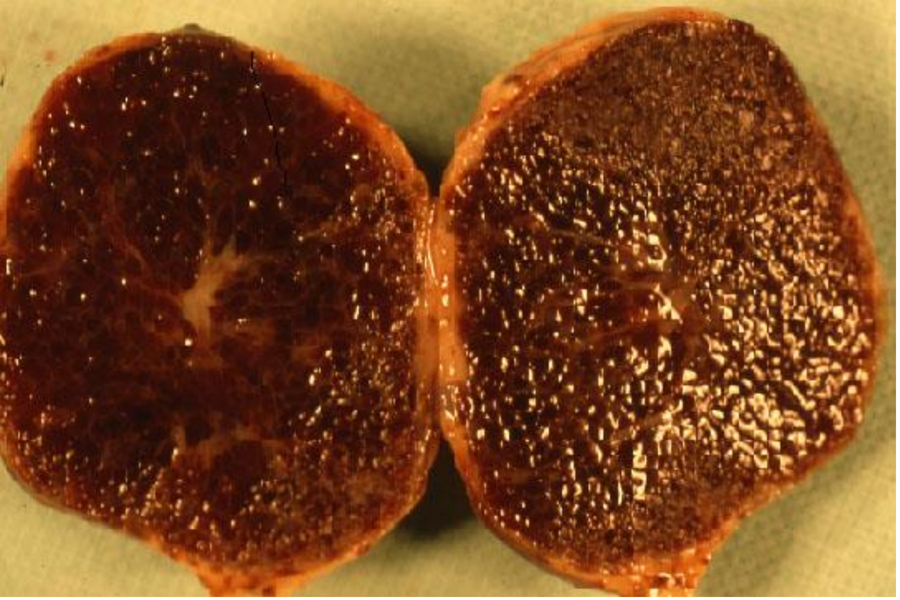


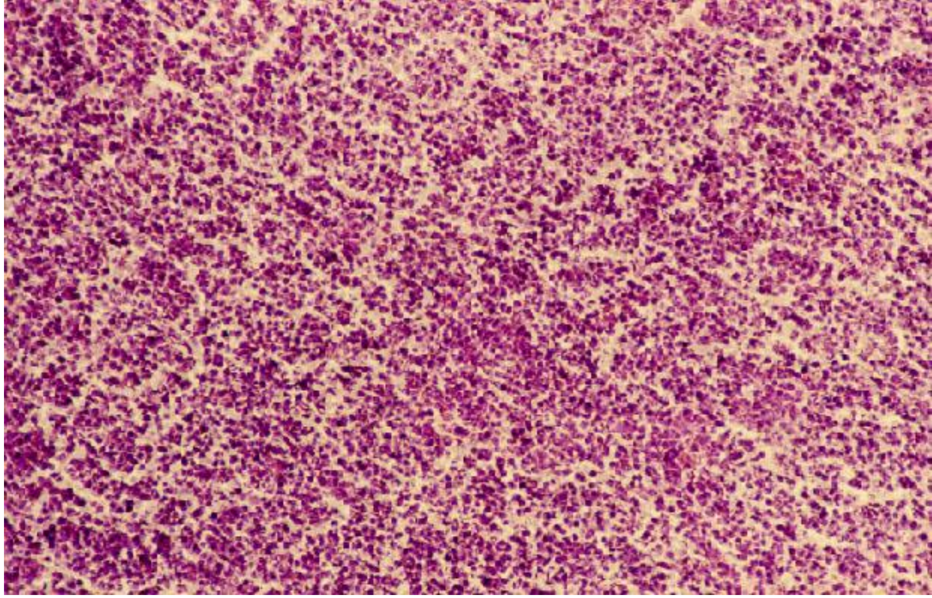




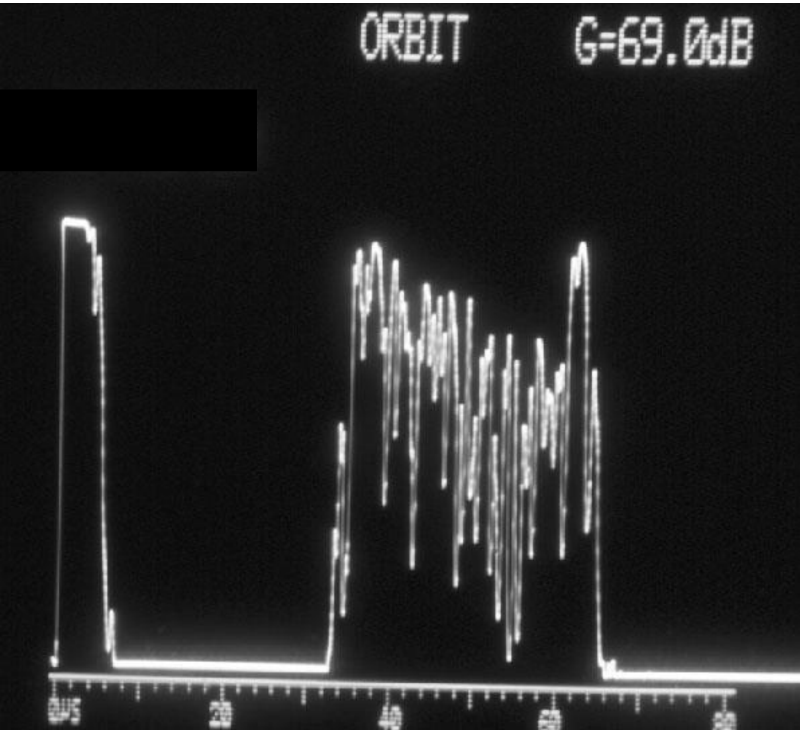


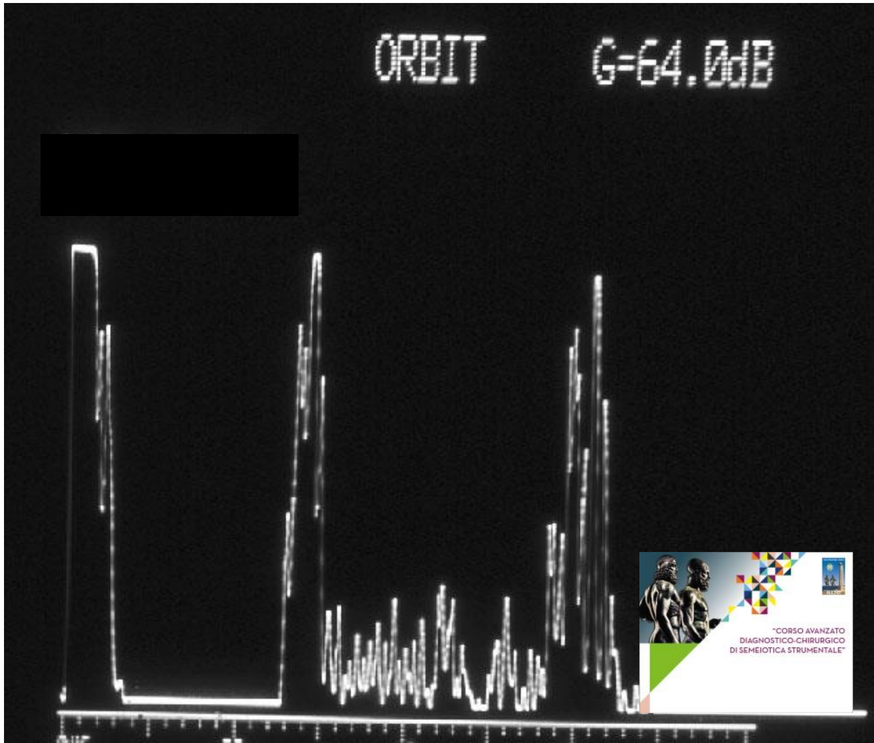




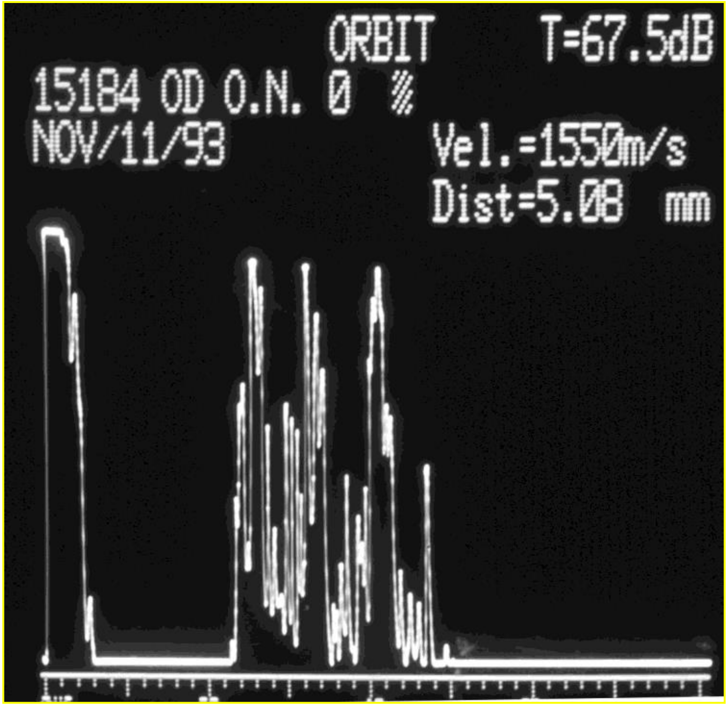


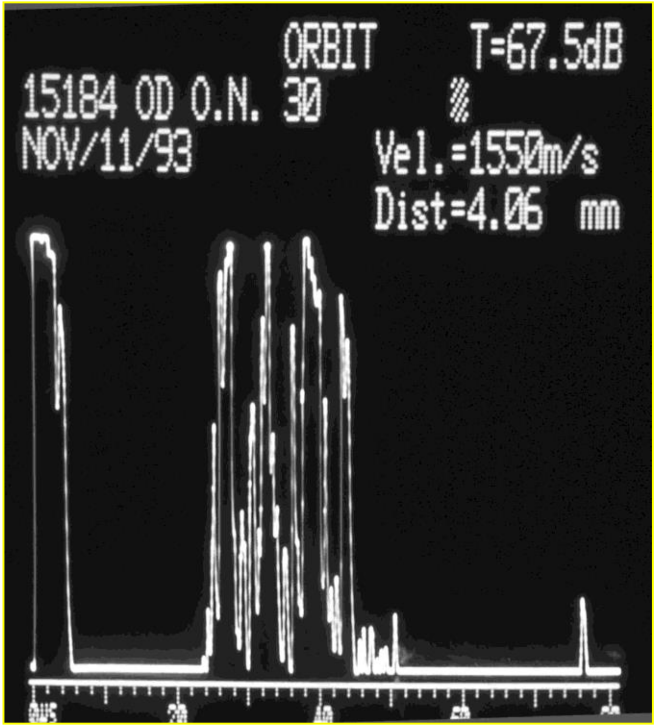
TUMORI





Ipertensione endocranica





CALCOLO DELLA IOL

- **MISURAZIONE DELLA LUNGHEZZA ASSIALE (0.1 mm= 0.25 D)**
- **MISURAZIONE DEL POTERE CORNEALE (0.1 mm = 0.50 D)**
- **Formule**

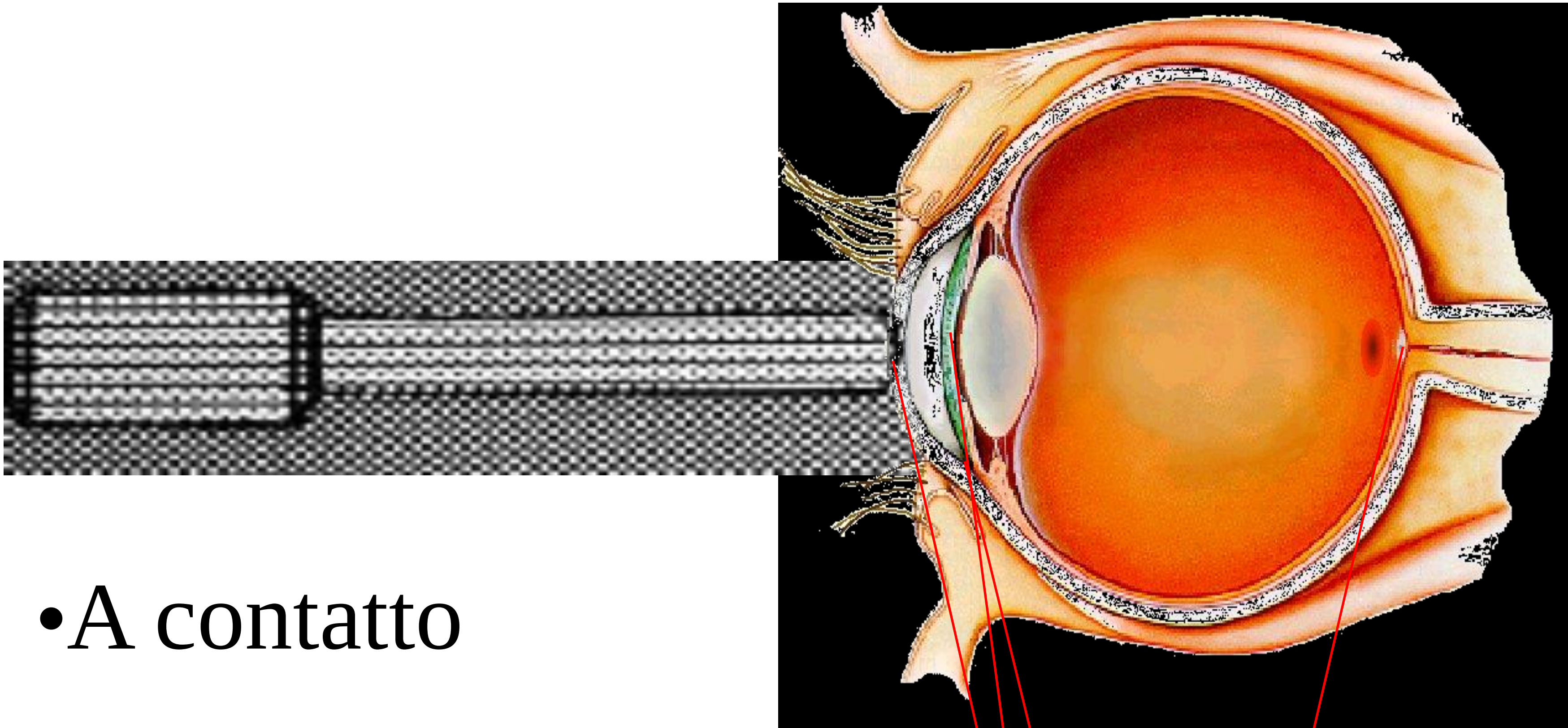
MISURAZIONE DELLA LUNGHEZZA ASSIALE

- **Biometria Ottica**

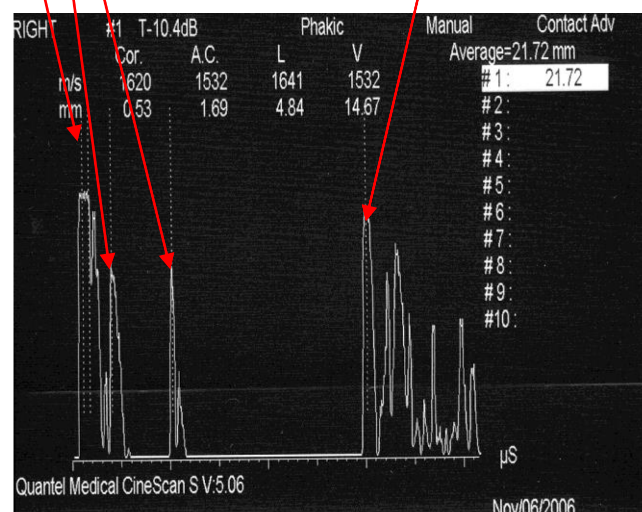
- **Ecografia**

  ~~Tecnica a contatto~~

  Tecnica ad immmersione

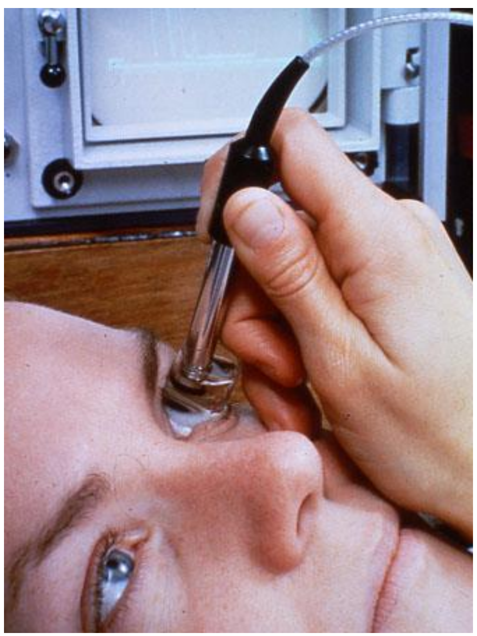


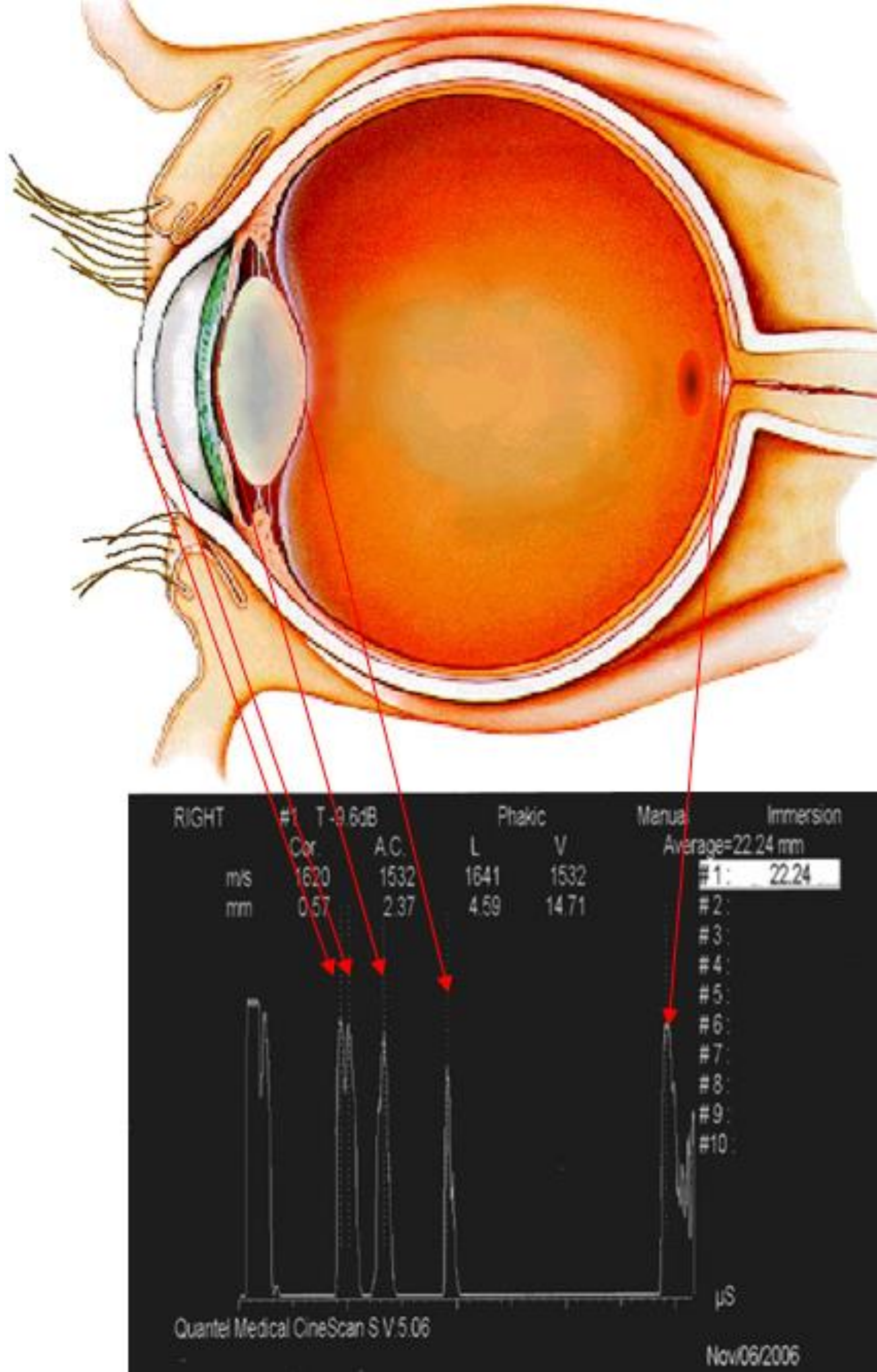
- A contatto



Picchi massimali


20
24
22
16




RIGHT
#1 T -9.6dB
Phakic
Immersion
Cor.
A.C.
L
V
Average=22.24 mm
m/s 1620 1532 1641 1532
mm 0.57 2.37 4.59 14.71
#1: 22.24
#2:
#3:
#4:
#5:
#6:
#7:
#8:
#9:
#10:
µS
Quantel Medical CineScan S V 5.06
Nov/06/2006

Fedorov SN, Kolinko AI, Kolinko AI: A method of calculating the optical power of the intraocular lens (1967) Vestnik Oftalmologii, 80 (4), pp. 27-31.

CLASSIFICAZIONE

- I Generazione: Binkorst, SRK
- II Generazione: SRK II
- III Generazione: Holladay1, Hoffer Q, SRK/T
- IV Generazione: Holladay 2 e Haigis
- V? Barrett Universal II,
- Ray tracing ?
- Intelligenza artificiale?

GUEST EDITORIAL

Pursuing perfection in intraocular lens calculations: I. Logical approach for classifying IOL calculation formulas

Douglas D. Koch, MD
Warren Hill, MD
Adi Abulafia, MD
Li Wang, MD, PhD

Volume 43 Issue 6 June 2017

- Storici, basati sulla rifrazione
- Formule di regressione
- Formule di vergenza
- Intelligenza artificiale
- Ray Tracing

Comparison of intraocular lens computations using a neural network versus the Holladay formula

Gerald P. Clarke, MD, Jeanne Burmeister, RN

ABSTRACT

Purpose: To compare the accuracy of intraocular lens (IOL) calculations using Holladay personalized calculations and a new method of trained neural networks.

Setting: A private ophthalmic practice.

Methods: We developed and trained a neural network to predict IOL powers using a personalized Holladay program and clinical data from 200 consecutive cases of one surgeon's results with one IOL. Clinical data included preoperative axial length, both keratometry values, anterior chamber depth, and human lens thickness. The neural network was trained to produce the actual postoperative refractive error, and the Holladay surgeon factor was continuously refined using the same results. After the network was successfully trained against the clinical data, it was used to compute IOL power in a double-masked study. Ninety-five patients were randomized between the Holladay personalized calculation and the neural network computation. There were no significant differences in age or preoperative refractive errors between the two groups. Manifest refractions were obtained during the masked period at least 6 weeks after surgery.

Results: Mean postoperative error from predicted refraction was +0.271 diopters (D) for the neural network group and −0.217 D for the Holladay personal group. Mean absolute error from predicted refraction was +0.63 D for the neural network group and +0.93 D for the Holladay personal group. There was a significant difference in postoperative refractive errors and mean absolute error between the two groups ($P < .022$; nonparametric Mann-Whitney test). An error of less than ±0.75 D was obtained by 72.5% of the neural network group and 50.0% of the Holladay group.

Conclusions: The neural network prediction formula can improve IOL implantation calculations by tightening the variance of errors. *J Cataract Refract Surg 1997; 23:1585–1589*

The neural network was trained using the following clinical input variables: preoperative axial length, first keratometry value, second keratometry value, cataract lens thickness measured by ultrasound, and anterior chamber depth measured by ultrasound.

Ray tracing for intraocular lens calculation

Paul-Rolf Preussner, MD, Jochen Wahl, MD, Hedro Lahdo, MD, Burkhard Dick, MD, Oliver Findl, MD

Purpose: To improve accuracy in intraocular lens (IOL) calculations and clarify the effect of various errors.

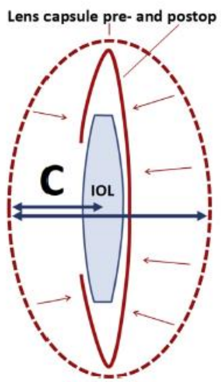
Setting: University eye hospitals, Mainz, Germany, and Vienna, Austria.

Methods: A numerical ray-tracing calculation has been developed for the pseudophakic eye. Individual rays are calculated and then undergo refractions on all surfaces of the IOL and cornea. The calculations do not use approximations; ie, the refractions are calculated exactly using Snell's law. Rays can be calculated for any distance from the optical axis and for other parameter variations. The effects of aspheric surfaces can also be investigated. Instead of IOL powers, manufacturers' IOL data (radii, refractive index, thickness) are used in the calculations for different IOL types. The resulting optical quality is visualized by using Landolt rings superimposed on the grid of retinal receptors.

Results: Intraocular lens design, corneal asphericity, and specific spherical aberration influence the visual quality of the pseudophakic eye significantly. The IOL refractive power is an ambiguous parameter that cannot characterize the visual outcome sufficiently accurately for an IOL implanted at a given position. The effects can be calculated only in numerical ray tracing, not in Gaussian optics. The accuracy of numerical ray tracing is independent of axial length. Therefore, very long or very short eyes gain the most from the higher accuracy of this approach. For average-size eyes, however, the results are the same as with SRK calculations.

Conclusion: Calculations in Gaussian optics should be replaced by state-of-the-art numerical methods, which can be run on any standard personal computer.

J Cataract Refract Surg 2002; 28:1412–1419 © *2002 ASCRS and ESCRS*



$$C = \left(ACD_{post} + T_{IOL}/2 - ACD_{pre}\right)/LT_{pre}$$

C constant: New concept for ray tracing–assisted intraocular lens power calculation

Thomas Olsen, MD, PhD, Peter Hoffmann, MD

PURPOSE: To evaluate the accuracy of the C constant for ray tracing–assisted intraocular lens (IOL) power calculation.

DESIGN: Case series.

SETTING: Public university hospital and private clinic.

METHODS: Preoperatively, all intraocular distances were measured using laser biometry. Various IOL designs were studied; powers ranged from −5.0 diopters (D) to +38.0 D. The IOL power calculation was performed with the Olsen formula using the C constant and compared with the Haigis, Hoffer Q, Holladay 1, and the SRK/T formulas on optimized datasets. Outcome measures were the error of the prediction, expressed as the arithmetic error, and the absolute error between the observed refraction and the predicted refraction.

RESULTS: Two thousand forty-three cases from the 2 centers were studied. No significant differences were found between the Haigis, Hoffer Q, Holladay 1, and SRK/T formulas with the exception of the SRK/T formula, which performed better than the other thin-lens formulas in eyes with an axial length (AL) greater than 27.0 mm (P<.01). Compared with the SRK/T formula, the Olsen formula showed an improvement of 15% and 14% in the mean absolute error and a 39% and 85% reduction in the number of large errors (>1.0 D) for the 2 series, respectively (P<.0001). Contrary to the Olsen formula, all thin-lens formulas showed a significant bias in terms of the AL, keratometry reading, and anterior segment length (P<.0001).

CONCLUSION: The C constant is a promising concept for ray tracing–assisted IOL power calculation.

Financial Disclosure: Dr. Olsen is a shareholder of IOL Innovations Aps, manufacturer of the Phacooptics IOL calculation software. Dr. Hoffmann has no financial or proprietary interest in any material or method mentioned.

J Cataract Refract Surg 2014; 40:764–773 © *2014 ASCRS and ESCRS*

ARTICLE

Intraocular lens power calculations in short eyes using 7 formulas

Sabite E. Gökce, MD, John H. Zeiter, MS, Mitchell P. Weikert, MD, Douglas D. Koch, MD, Warren Hill, MD, Li Wang, MD, PhD

Purpose: To investigate the accuracy of 7 intraocular lens (IOL) calculation formulas in predicting refractive outcome in eyes with axial lengths (AL) equal to or less than 22.0 mm and to evaluate factors contributing to prediction errors.

Setting: Cullen Eye Institute, Baylor College of Medicine, Houston, Texas, and private practice, Mesa, Arizona, USA.

Design: Retrospective case series.

Methods: Eighty-six eyes of 67 patients were included. Seven IOL calculation formulas were evaluated: Barrett Universal II, Haigis, Hill-RBF, Hoffer Q, Holladay 1, Holladay 2, and Olsen. The refractive prediction error was calculated as the difference between the postoperative refraction and the refraction predicted by each formula. The mean refractive prediction error and median absolute error were also calculated.

Results: The Hoffer Q and Holladay 2 formulas produced myopic refractive prediction errors of −0.22 diopter (D) and −0.23 D, respectively, and the Olsen formula produced a hyperopic refractive prediction error of +0.27 D (all $P < .05$). Without adjustment of the mean refractive prediction errors to zero, the only difference between formulas was that Hill-RBF had a statistically significantly smaller median absolute error than Hoffer Q ($P < .05$). With adjustment of the mean refractive prediction errors to zero, there were no statistically significant differences in the median absolute errors between the 7 formulas ($P = .076$).

Conclusions: The Hoffer Q and Holladay 2 formulas produced slightly myopic refractive prediction errors, and the Olsen formula produced hyperopic refractive prediction errors. When the mean numerical refractive prediction error was adjusted to zero, no statistically significant differences in the median absolute error were found between the 7 formulas.

J Cataract Refract Surg 2017; 43:892–897 © 2017 ASCRS and ESCRS

FORMULE

ARTICLE

Formula choice: Hoffer Q, Holladay 1, or SRK/T and refractive outcomes in 8108 eyes after cataract surgery with biometry by partial coherence interferometry

Petros Aristodemou, FRCOphth, Nathaniel E. Knox Cartwright, MRCOphth,
John M. Sparrow, DPhil, FRCOphth, Robert L. Johnston, FRCOphth

J Cataract Refract Surg 2011; 37:63–71 © 2011 ASCRS and ESCRS

- **AL < 21mm: Hoffer Q**
- **AL 21-21,49 mm: Hoffer Q-Holladay 1**
- **AL 21,5 -26,99: SRK T- Holladay 1**
- **AL > 27 mm: SRK T**

GRAZIE PER L'ATTENZIONE