Asuneɣ n tiṭ s yimesliyen ulṭrasun

PIROP A+B+CCT

Biyumetri, ultrasons d pakimetri deg yiwen n yibenk n wallen.

Ibenk n ultrasons i biyumetri n wallen. Tamuɣli n wallen d pakimetri. A-Scan + B-Scan + apakimitr CCT.



PIROP A+B+CCT · Tugna

Iɣbula d yisemliyen

Suter tasɣunt n ssuma

Wali afaris

Tettwahegga ass n 2026-11-09

> Taferkit-a n ufaris thegga-tt ASEM. Ur tettbeddil ara isemliyen unsiben n umeskar neɣ tinaḍin n useqdec.

Iferdisen igejdan

Biyumetri s uskar A

Teɣzi ɣef ugellus d usiḍen n tzemmert n lentiy IOL.

Iɣbula d yisemliyen · Aɣbalu yettwasentem ass n 2026-10-17

Tugniwin ultrasons s uskar B

Tugniwin ultrasons n tɣessiwin yellan daxel n tiṭ.

Iɣbula d yisemliyen · Aɣbalu yettwasentem ass n 2026-10-17

Pakimetri CCT

Akat s ultrasons n tḍuḍi n lqerniya.

Iɣbula d yisemliyen · Aɣbalu yettwasentem ass n 2026-10-17

A-Scan n biyumetri

Ikaten n tiṭ d usiḍen n tnezmart n yimplanten daxel n tiṭ.

B-Scan

Tugniwin s ultrasons n daxel n tiṭ.

Apakimitr CCT

Akat n tuzert n lqerniya s umudul uslig.

Tiwuriwin deg usnas

Biyumetri A

Iɣbula d yisemliyen

Tugniwin B s ultrasons

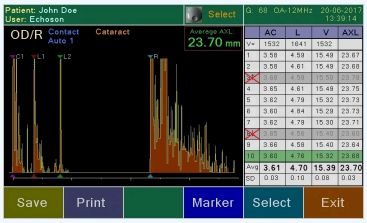
Iɣbula d yisemliyen

Pakimetri CCT

Iɣbula d yisemliyen

Kraḍ n yikayaden dduklen

A-Scan, B-Scan d CCT ddun deg yiwet n tinasant n wallen.



PIROP A+B+CCT · Tugna

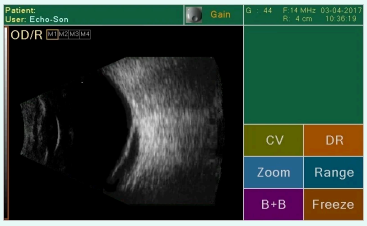
Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

Anermis anallay

Agdil anallay n 7 n yidudan yesuddes tiwuriwin d taffa n yimuḍan.



PIROP A+B+CCT · Tugna

Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

Kayad, sekles isemliyen

Ḥrez ikaten, tugniwin d yimaɣnuten n yiseqdacen deg unagraw.



PIROP A+B+CCT · Tugna

Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

Askan d twuriwin

1. Ikar n tugniwin: B, B+A, B+B.

2. Askar A: yella ɣef yizirig yettwafren deg Run d Freeze.

3. Cineloop: aɛiwed n twali n wazal n 6 n tasinin i yal tiṭ iman-is.

4. Aḥraz n tugniwin: 4 n yimukan n ccfawat (M1 ar M4) i yal tiṭ iman-is.

B-SCAN

1. Tulmisin titiknikanin.

• Asnagar n tessast: 12 ar 15 MHz.
• Teɣmert n unṭaf: 55°.
• Tilisa n unṭaf: 20 ar 60 mm.

2. Taɣara n tugna d yiseggimen.

• GAIN/tilisa timussanin: alamma 110 dB / 90 dB.
• TGC: aseggem n GAIN ilmend n yiḥricen n tiṭ yettwafren.
• Iswiren n uɣiɣdan: 256.
• Aseɣti n tilisa timussanin.
• Aseɣti umḍin n GAIN deg uskar Freeze.

3. Tifrat.

• Tifrat taklinikant ɣef ugellus: 0,12 mm.
• Tifrat taklinikant n yidis: 0,3 mm.

Tassast B-Scan

Asnagar: 12/15 MHz.
Asnas: tugniwin n daxel n tiṭ, retin, anerb n tiṭ, atg.

Tulmisin-nniḍen B-SCAN

1. Ikar n uskan.

• Ikar: B, B+A, B+B.
• Askar A i yizirig yettwafren deg CV, deg Run d Freeze.
• Asimɣer (x2) deg Run d Freeze.
• Cineloop n wazal n 6 n tasinin i tiṭ tayefust d tazelmaḍt iman-nsent.

2. Ccfawat d uḥraz.

• Ccfawat n tugniwin: M1..M4 i tiṭ tayefust d tazelmaḍt iman-nsent.

3. Ikaten d yisallen imernan.

• Ikaten n yimecwaṛen s useɣti n urured n ultrasons.
• Ikaten n yiḥricen d teɣmert.
• Inadiyen d yisallen i d-yettaru useqdac.

4. Tuffɣa.

• Tuffɣa n uvidyu amas uddis i tsaggazt n uvidyu.

A-SCAN

Biyumetri yemden, arurad:
– Taɣzi n tiṭ ɣef ugellus (AXL).
– Telqay n texxamt tamezwarut (AC).
– Tuzert n ukristalin (LENS).
– Taɣzi n vitri (VITR).

Akat i wanawen meṛṛa n wallen: amagnu, katarakt, katarakt leqway, afaki, vitri s zzit n silikun, psidufaki (PMMA, ACRYLATE, SILICONE).

Tassast A-scan

Asnagar: 12 MHz.

Asnas: biyumetri d usiḍen n tnezmart n yimplanten daxel n tiṭ.

Sḍis n tformulin IOL A-SCAN

SRK II, SRK T, Holladay, Hoffer-Q, Binkhorst II, Haggis.

Tifurmulin deffir ugzay n rifraksyun:

Double-K SRKT, Latkany /Flat-K SRKT/, Latkany /avg-K SRKT/, Masket.

Tulmisin A-SCAN

1. Tarrayin d twuriwin.

• Aserwes n yisiḍanen n tnezmart IOL i tlentiyin d tarrayin n usiḍen yemgaraden.
• Tarrayin n unermis d uɣmuḍ (aferdis n uɣmuḍ yeddukel).
• Tassast s uɣlal alemmas n tafat i users iwulmen n tiṭ.

2. Taɣara n tugna d yiseggimen.

• Aseggem awurman TGC.
• Aseggem GAIN alamma 110 dB.

3. Ikaten d tesleḍt.

• Aḥraz n 20 n yinṭafen s yikaten i tesleḍt n zdat.
• Asiḍen n tlemmast d umgired amagnu.
• Asenqed awurman n uzuzzer n yikaten, s useɣti s ufus.

4. Aseggem d useɣti.

• I 10 n yiseqdacen, 10 n yimaɣnuten i yal yiwen.
• Iseggimen d yikayaden s ukalibratur yedduklen.

5. Tulmisin titiknikanin.

• Asnagar n tessast: 12 MHz.
• Aḥric n unṭaf: 45 mm / 2500 n yigazen deg yal izirig.
• Tifrat taklinikant: 0,1 mm.
• Tifrat tiliktruniyant: ±0,01 mm.

Apakimitr CCT

1. Ikaten iruraden n tuzert n lqerniya.

• Asnagar ɛlayen n ukat: 400 MHz.

• 512 n yiseklisen iwurmanen n ukat.

• Ikaten n tuzert i wanawen meṛṛa n lqerniya.

• Akat n tuzert talemmast n lqerniya (CCT).

• Akat n tuzert ɣef yigazen i yettwafranen s tlelli.

• Ikaten iwurmanen d wid s ufus.

• Asiḍen n tlemmast n yikaten.

• Asiḍen n umgired amagnu n tuzert yettwakayaden.

• Tilin n tukksa n yikaten ur neṣḥiḥ ara.

2. Telqay d tikkelt.

• Ilguritmen i usebɣer n telqay.

• Arured ɛlayen n unṭaf n yisefka.

Tassast n pakimetri

1. Asnagar n umahil n tessast: 20 MHz.

2. Arured amagnu n ultrasons: 1640 m/s (tilisa 1400 ar 2000 m/s).

Isefka itiknikanen:

• Tilisa n ukat: 220 µm ar 1100 µm.

• Telqay n ukat: ≤2 µm.

• Tifrat: 1 µm.

Asiḍen n tḍɣeṭ daxel n tiṭ (PIO)

• Asiḍen awurman neɣ s ufus n PIO s useɣti.

• 10 n tformulin n useɣti n PIO llant:

Kohlhas/Shah,
Argus et al.,
Whitarce et al.,
Doughty,
Ehlers, Dresden,
Stodmeister,
tafurmula tusligt n useqdac.

Tikarḍiwin yettwasegzin n tuzert n lqerniya

• Tẓa n tkarḍiwin n tuzert ttwaheggant, s yimḍanen n yigazen:

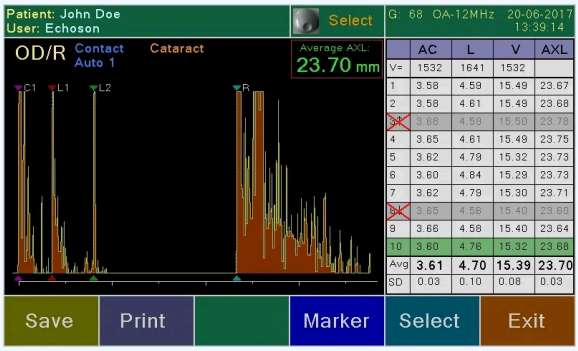
1, 5, 9, 13, 21, 25, 1 MULTI, 5 MULTI, 9 MULTI.

• Akayad n yiḥricen n tlemmast, ɣer yidis n tlemmast, yiri, lḥiḍ neɣ imesdukkalen.

I wakken ad yishil ubrid n umahil

Biyumetri s unermis neɣ s uɣummes

Askar A yektil taɣzi ɣef ugellus, telqayt n texxamt tamezwarut, tuzur n tikristal d taɣzi n vitri. Tassast A txeddem s 12 MHz.



PIROP A+B+CCT · Tugna

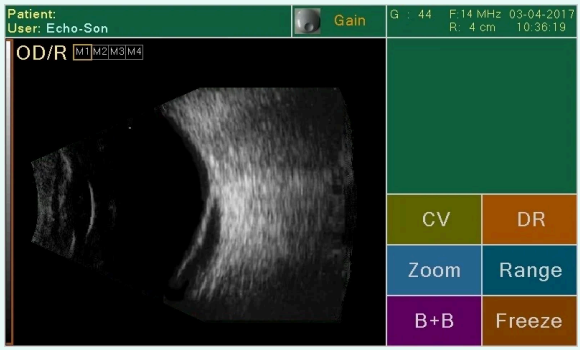
Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

Aṭas n yiskanen deg uskar B

Ikugrafi tettak timuɣliwin B, B+A d B+B, s tkatutin yemgaraden i snat n wallen d tallest n sinima n ɣer 6 n tasinin.



PIROP A+B+CCT · Tugna

Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

I useqdec n yal ass

Pakimetri d tkarḍiwin

Tassast n pakimetri txeddem s 20 MHz. Azilal i d-yettwasuffɣen d seg 220 ar 1100 µm, s tẓa n tkarḍiwin yellan si tazwara d usiḍen n talemmast n yiktilen.



PIROP A+B+CCT · Tugna

Tugna n umeskar. Tawila yettwaskanen tezmer ad temgarad ɣef tin ara d-yettunefken.

Iɣbula d yisemliyen

Iɣbula d yisemliyen

Aḥraz d yineqqisen

Askanir yesɛa taffa n yimuḍan deg-s d uḥraz ɣef tkatut USB. Tasaggazt tatirmalt yellan deg-s tessufeɣ ineqqisen A-scan d P-scan.

Iɣbula d yisemliyen

Izegrar n uselkim yettwaɛeqlen

PIROP-PC yettağğa asefrek n yikayaden deg uselkim Windows. Tallalt DICOM 3.0 i PACS/RIS d afran amernan.

PIROP-PC d DICOM d ifran; ur nettwaḥsab ara belli ddant-d.

Iɣbula d yisemliyen

Isallen itiknikanen d yisemliyen

Ticreḍt
Echoson

Anaw
PIROP A+B+CCT

Tatiknuluji
Tugniwin n wallen s ultrasons

Aseqdec akliniki
Tugniwin d OCT · Adiyagnustik d biyumetri

Imudulen
A-Scan + B-Scan + CCT

Agdil
LCD anallay n 7 n yidudan

Tazwert taddayt n pakimetri
220 µm

Iɣbula d yisemliyen

Tazwert tafellayt n pakimetri
1100 µm

Iɣbula d yisemliyen

Tassast A-scan
12 MHz

Iɣbula d yisemliyen

Tassast B-scan
12–15 MHz

Iɣbula d yisemliyen

Tassast CCT
20 MHz

Asnagar n tessast; asnagar agensu n ulguritm ur yeddukel ara.

Iɣbula d yisemliyen

Tifrat B-scan ɣef ugellus
0.12 mm

Tifrat taklinikant ɣef ugellus deg uskar B.

Iɣbula d yisemliyen

Tuqqna
USB · Avidyu amas uddis PAL

Iɣbula d yisemliyen

Aseɣẓan
PIROP-PC d afran; DICOM 3 d afran

Ifranen ur ttwaḥsaben ara dduklen.

Iɣbula d yisemliyen

Asaɣ n trisiti
100–230 V AC ; 50–60 Hz / 12 V DC

Iɣbula d yisemliyen

Tisekta
290 × 205 × 85 mm

S tsaggazt.

Iɣbula d yisemliyen

Taẓayt
1.5 kg

S tsaggazt.

Iɣbula d yisemliyen

Asnagar n tessast; asnagar agensu n ulguritm ur yeddukel ara.

Tifrat taklinikant ɣef ugellus deg uskar B.

Ifranen ur ttwaḥsaben ara dduklen.

S tsaggazt.

Asider d yiɣbula

- https://echoson.pl/en/pirop-en/
  Aɣbalu yettwasentem ass n 2026-10-05
- https://echoson.pl/en/pirop-en/
  Aɣbalu yettwasentem ass n 2026-10-17
- https://echoson.pl/en/pirop-en/
  Aɣbalu yettwasentem ass n 2026-08-30
- https://echoson.pl/en/pirop-en/
  Aɣbalu yettwasentem ass n 2026-10-18

Isteqsiyen-nwen ɣef PIROP A+B+CCT

D acu Tazwert taddayt n pakimetri iɣef llan yisemliyen n PIROP A+B+CCT?

220 µm

Iɣbula d yisemliyen

D acu Tazwert tafellayt n pakimetri iɣef llan yisemliyen n PIROP A+B+CCT?

1100 µm

Iɣbula d yisemliyen

Anta tawila i ilaq ad sentmeɣ i PIROP A+B+CCT?

Asnagar n tessast; asnagar agensu n ulguritm ur yeddukel ara.

Iɣbula d yisemliyen

Tassast n pakimetri txeddem s 400 MHz?

Ala. Tassast tettunefk i 20 MHz. Tazwert 400 MHz i d-yessuffeɣ umeskar terza asmedyel agensan, maćči asnagar n umesnifel n tazmert.

Iɣbula d yisemliyen

DICOM yedda-d akked yal ibenk?

Ameskar yeskan PIROP-PC d amerna afrayan, DICOM 3.0 d afran amernan. Yal yiwen ilaq ad yettwasentem deg twila yettwasutren.

Iɣbula d yisemliyen

Wali akatalug akliniki n ASEM

Wali taɣulin icudden deg ukatalug ASEM. Iseɣwan-a ur rennun ara isnasen imaynuten i yibenk-a.

Tugniwin d OCT

Asenqed d biyumetri

Ugar n yibenk, d amɛiwen i wakud ɣezzifen

Mmeslay ɣef usenfar-ik akked ASEM: afran n yibenkan, asbeddi, asileɣ d tallalt tatiknikant.



Tugna n umeẓlu

Asbeddi

Mmeslay ɣef yisuturen n usbeddi d twila akked terbaɛt-nneɣ tatiknikant.

Issin ugar



Tugna n umeẓlu

Asileɣ

Suter isallen ɣef usileɣ d ulmad n useqdec yellan i yibenk-ik.

Issin ugar



Tugna n umeẓlu

Ameẓlu deffir uznuzu

Nermes ASEM i tallalt tatiknikant d umɛiwen i yibenk-ik.

Issin ugar



Tugna n umeẓlu

Anṣaḥ n yimussnawen

Mmeslay-aɣ ɣef yisuturen-ik iklinikiyen i wakken ad nefren ibenkan iwulmen.

Issin ugar

Nermes amussnaw

Wali akk ifarisen

Asmel n umeskar

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