



RLES AI® LASER SURGICAL REPORT

COMPLEX CASE: Q-LASIK ON A THIN CORNEA — FULL-DEPTH DEMO

REFRACTIVE LASER EYE SURGERY - ARTIFICIAL INTELLIGENCE ASSISTED

DEMO REPORT — FICTITIOUS PATIENT

This document is a demonstration output of the RLES AI® report engine. The patient and all measurements are FICTITIOUS; they belong to no real person. Not for clinical use; no medical decision may rely on it. Real reports are produced by the same engine from the surgeon's uploaded examinations.

1 · PATIENT · DEVICES · SOURCE DOCUMENTS

Field	Value
Patient	DEMO PATIENT A (fictitious) · 29 · Q-LASIK
Excimer	Alcon WaveLight EX500 — profile loaded: AZ from specification (9.0 mm regardless of OZ)
Microkeratome	Med-Logics ML7 · metal head + CLB blades (SD $\pm 5 \mu\text{m}$ — reported, never deducted)
Source documents	Pentacam 4-map PDF · autorefractor printout · manifest form — every value read with its source, entered only after surgeon confirmation (Rule 5.5)

2 · PREOPERATIVE DATA — BOTH EYES

	OD (right)	OS (left)
Manifest	-6.00 -1.25 $\times 10$	-3.75 -3.00 $\times 175$
K1 / K2	43.2 / 44.9 D	43.4 / 46.1 D
Kmax	45.6 D	46.4 D
Thinnest pachymetry	500 μm	538 μm
W2W · ACD	11.9 mm · 3.35 mm	11.9 mm · 3.32 mm
Scotopic pupil	6.1 mm	6.2 mm
Ocular HOA RMS (6 mm)	0.22 μm	0.26 μm
ACA (Angle/IC)	34°	35°

3 · THE OPTIMIZER — WHY THE FIRST PLAN FAILED, WHAT WAS FOUND (OD)

Plan	Flap	OZ	Ablation	RSB	RCT	PTA	Verdict
Standard (110 · 6.5)	110 μm	6.5	109 μm	281	391	%43.8	RSB < 300 — VIOLATION
Middle (100 · 6.5)	100 μm	6.5	109 μm	291	391	%41.8	RSB < 300 — VIOLATION
CHOSEN (90 · 6.0)	90 μm	6.0	87 μm	323	413	%35.4	ALL FLOORS ✓

Ablation from the measured table: OZ 6.0 $\rightarrow$ 12.0 $\mu\text{m}/\text{D} \times$ steep meridian 7.25 D = 87 μm (not Munnerlyn — Rule 5). The thin flap coincides with ML7 Item 8: pachymetry $\leq 500 \rightarrow -10$ blade. Formulas: RSB = pachy — flap — ablation · RCT = pachy — ablation (flap-independent) · PTA = (flap+ablation)/pachy.

4 · SAFETY VERIFICATION — BOTH EYES, EVERY FLOOR



Check	OD	OS	Threshold · Status
RSB	323 µm	367 µm	≥ 300 ✓ / ✓
RCT	413 µm	457 µm	≥ 400 ✓ / ✓
PTA	%35.4	%31.8	OD limit 45% (Kmax<46) · OS limit 40% (Kmax≥46 — Rule 1 is DYNAMIC) ✓/✓
Postop K1/K2	38.4 / 39.1	40.4 / 40.7	36–49 D (Rule 9) ✓/✓
Max treatable ceiling	9.00 D	9.25 D	(K1–36)/0.8 — requested 6.00/3.75 ✓
Pupil vs OZ	6.1 / 6.0	6.2 / 6.0	AMBER — night-halo risk to discuss

5 · THE FULL ECTASIA INDEX SET + DECISION MATRIX

Index	OD	OS	Bands (normal/border/path.)
BAD-D	1.1	1.3	<1.6 · 1.6–2.6 · >2.6
ART max	395	372	µm — >340 · 260–340 · <260
ISK	1.1	1.2	<1.4 · 1.4–2.0 · >2.0
IVA	0.24	0.29	<0.28 · 0.28–0.32 · >0.32 — OS BORDERLINE
I-S (Rabinowitz)	0.9	1.2	D — <1.4 · 1.4–1.9 · ≥1.9
CBI / TBI	not entered	not entered	MISSING — not assumed normal; Corvis ST advised
Posterior elevation	7 µm	9 µm	<12 · 12–17 · >17
Pachymetric progression	—	—	single scan — no series

DECISION MATRIX (Mandatory Rule 2: no index is read alone)

OD: all indices normal → eligible · 12-month follow-up. OS: 1 borderline index (IVA 0.29) → CONDITIONAL · 6-month follow-up · Corvis ST (CBI/TBI) advised · prophylactic CXL may be considered. The decision reads BAD-D+ART+PTA+RSB+posterior elevation+Kmax+clinical context TOGETHER.

6 · RULE 13 — THE WARPAGE SCREEN (9 INDICATORS) + RECONSTRUCTION

All nine indicators were assessed one by one: |Sif| 0.9 (<1.4) · Ø3–Ø7 cylinder spread 0.3 D (<0.75) · inter-zone axis rotation 4° (<10) · apex–Sim-K gap 0.8 D (<2.5) · apex–neighbour gap 2 D (<5) · no RMS/A flag · LSA 0.4 D (<1.0) · serial pachymetry (no series — not assessable, NOT assumed normal) · autorefractor cylinder repeat 0.00 D (<0.25). RESULT: 0/9 — CLEAR. Contact-lens history: none.

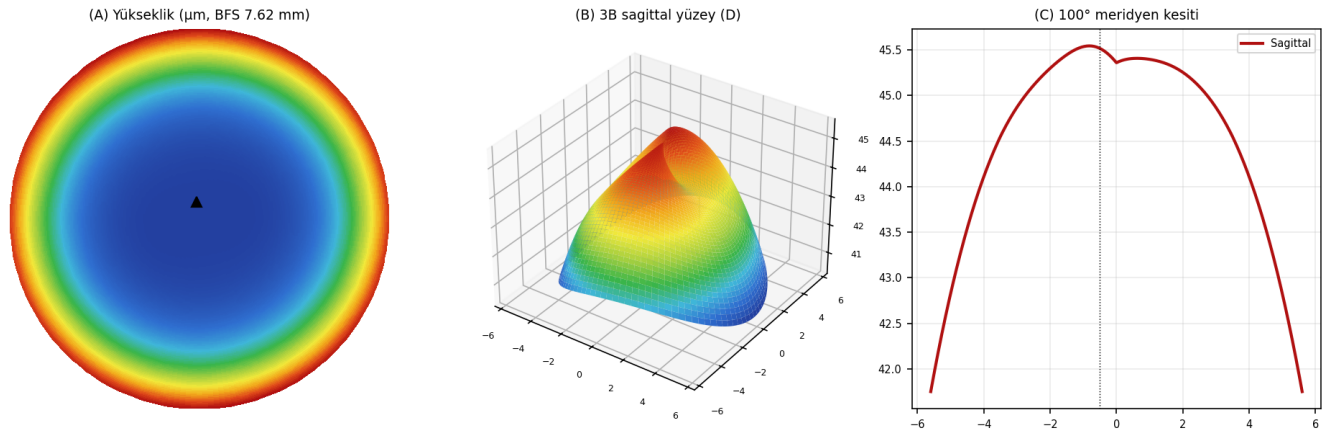


Figure 1 — OD surface reconstruction, NO irregularity (negative findings are proven too): regular 1.25 D bow-tie @ 100. Concordance: reconstruction apex $\approx 45.5 \leftrightarrow$ device Kmax 45.6 D. 1 D $\approx 10 \mu\text{m}$.

REKONSTRÜKSİYON DİPNOTU

Bu görsel, cihaz çıktısındaki sayısal değerlerden türetilmiş bir rekonstrüksiyondur; ham cihaz çıktısı değildir. 1 D $\approx 10 \mu\text{m}$.

7 · RULE 16 — ORA (ALPINS) BOTH EYES + VECTOR DIAGRAM

Eye	M (corneal plane)	C (corneal)	ORA	Ratio · Band
OD	1.19 D @ 10	1.70 D @ 10	0.51 D @ 100	0.43 · GREEN
OS	2.85 D @ 175	2.70 D @ 175	0.15 D @ 175	0.05 · GREEN

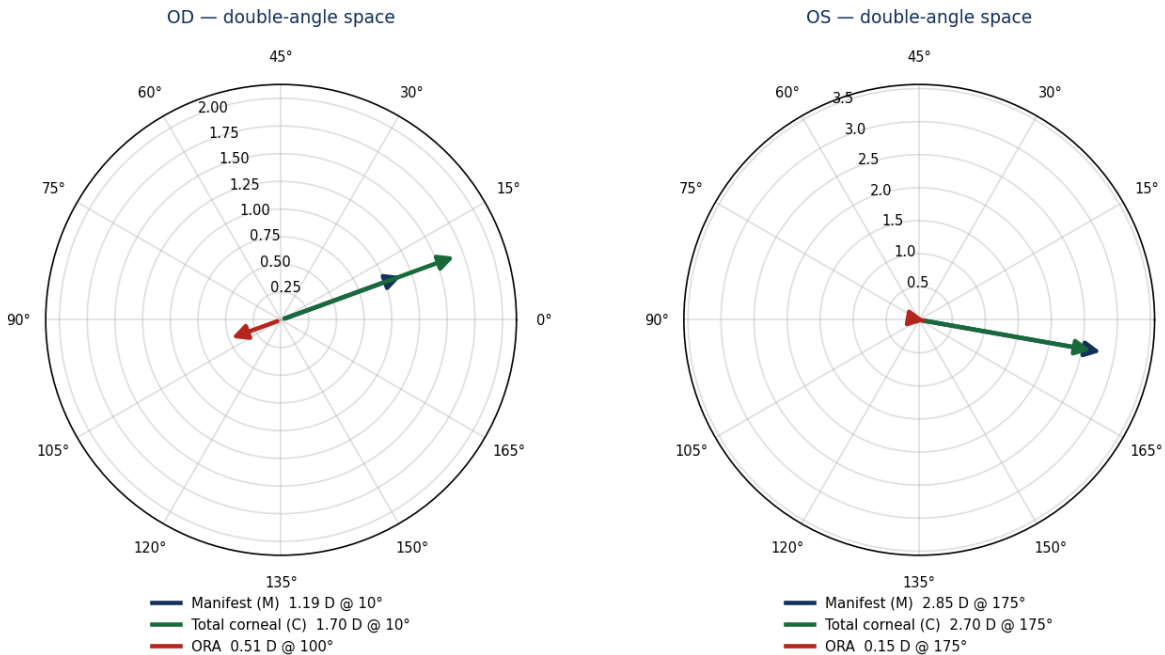


Figure 2 — Rule 16 Alpins diagrams, both eyes: in each eye M and C align and ORA is short $\rightarrow$ the cylinder is corneal; the manifest plan is vector-verified. Source analysis/apportionment NOT needed — the full counter-example lives in the WFG/TG demo.



8 · RULE 17 — THE ABLATION-PROFILE DECISION TREE

Step	Finding	Decision
1 · Rule 13	CLEAR	profile choice not deferred
2 · ORA / axis gap	both eyes green	TG + source analysis NOT required
3 · Ocular HOA RMS	0.22 / 0.26 μ m	< 0.35 → WFG not required
4 · Conclusion	regular cornea + low HOA	WFO (wavefront-optimised) SUFFICIENT — with rationale

9 · TEAR FILM · DRY EYE · MEDICATION · SYSTEMIC HISTORY

Screen	Values	Result
Tear-film 6 signatures	mires regular · consecutive Sim-K Δ 0.1 · SAI/SRI normal · no pseudo-KC · no data loss · NIBUT screen normal	0/6 ✓
Dry-eye preop set	OSDI 8 · TBUT 11 sn · Schirmer 12 mm · meiboskor 0 · no staining	normal — OSMOLARITY NOT ENTERED: missing, requested by name (Rule 5.3)
Medication history	isotretinoin · amiodarone · topiramate · steroids · OCP queried	clear ✓
Systemic disease	autoimmune · DM · pregnancy/lactation · HSV · atopy queried	clear ✓

10 · THE GLAUCOMA INTERSECTION

ACA 34°/35° — green (the narrow-angle rule: printed in every report). No glaucoma drops (G13 not triggered) · no glaucoma surgery history (G12 not triggered) · disc haemorrhage actively asked: none. Since no G rule fired, the GLAUCOMA REFERRAL SUMMARY is deliberately ABSENT — absence means 'no findings'. Note: after ablation GAT under-reads for life; preop IOP 15/15 + pachymetry were written into the Refractive Passport.

11 · THE ML7 NOMOGRAM — ALL EIGHT ITEMS APPLIED

Item	Application (OD → OS)
M1-M2	steepest K 44.9→K45 · 46.1→K46 (XX.50 rounds up; row selection only)
M3	W2W 11.9 $\geq$ 11.6 → treated as 12.00 → one ring size up (unconditional)
Ring-vacuum	both eyes 9.0 mm · 560 mmHg (K42-46 row) — fallback ready: if seal fails, 8.5 + zone 8.0-8.1
M4	AZ 9.0 (EX500) — ring 9.0 = gap 0.00 → SHIELD THE HINGE from pulses (amber)
M5	pachy 500 < 530 but ring is 9.0 (not 8.5) → no vacuum increase; limbus must be visible inside the ring
M7-M8	K>41 → +blade rule not in play; pachy $\leq$ 500 → -10 blade ADVISED, coinciding with the RSB decision

12 · THE HINGE PLAN — ALL THREE DIRECTIONS COMPUTED (M6)

Direction (OD)	Δ K	Ramp	Hinge thickness	Status
TEMPORAL — chosen	2.6 D	26 μ m	64 μ m	OPEN ✓ (preference 1: trauma+nerves)



Direction (OD)	ΔK	Ramp	Hinge thickness	Status
Superior	3.4 D	34 μm	56 μm	open (≥ 55) — preference 2
Nasal	4.1 D	41 μm	49 μm	CLOSED (< 55) — free-flap risk

Physics: 1 K $\approx$ 10 μm . Hinge = 90 μm flap — ramp. The three escape routes on record: steep-axis hinge · +blade · vacuum +10/+20 (never past 580) — none needed here. T/N labels mirror between OD/OS; the reading respected that.

13 · PROCEDURE COMPARISON — SIX PROCEDURES × BOTH EYES

Procedure	OD	OS
Q-LASIK / LASIK / iLASIK	ELIGIBLE — the chosen plan	ELIGIBLE (flap 90 · OZ 6.0)
SMILE / SILK	CCT ✓ · feasible; PTA informational (threshold validated in LASIK)	feasible
PRK / T-PRK (OD)	tiered RCT floor: CBI/TBI unmeasured → 380–400 band; RCT 413 in the amber upper band	—
PRK / T-PRK (OS)	—	EXCLUDED — cylinder 3.00 D: haze/crescental haze (Rule 12, prudently ≥ 3.0)
Phakic ICL	not needed — the laser window is open; endothelial ACD 3.35 on record (the Rule 10 route can open any time)	not needed

14 · SURGICAL PLAN — READY FOR APPROVAL (BOTH EYES)

Parameter	OD	OS
Procedure	Q-LASIK (ML7 + EX500)	Q-LASIK (ML7 + EX500)
Flap · blade	90 μm · CLB –10	90 μm · CLB –10
Ring · vacuum	9.0 mm · 560 mmHg	9.0 mm · 560 mmHg
Hinge	TEMPORAL · 64 μm · shielded	TEMPORAL · 61 μm · shielded
OZ · AZ	6.0 · 9.0 mm	6.0 · 9.0 mm
Ablation (profile: WFO)	87 μm	81 μm
Expected postop K	38.4 / 39.1 D	40.4 / 40.7 D
Intraop notes	anaesthetic $\leq 1-2$ drops · confirm limbus inside ring	same + Corvis confirmation first for OS

15 · SUPPLEMENTARY ASSESSMENT · GAPS · CONCLUSION

Supplementary assessment (4d): with OS's borderline IVA, Corvis ST carries asymmetric value — an abnormal result closes the corneal route, a normal one supports a morphological variant without guaranteeing surgical provocation. GAPS (none assumed normal): tear osmolarity · CBI/TBI · serial tomography. The report is NOT finalised until these three arrive; the same engine then re-issues it.

CONCLUSION — THESE EYES ARE OPERABLE

A thin cornea that standard parameters would reject passes every floor in both eyes once the window is right. Conditions: Corvis confirmation for OS + osmolarity. The final decision and approval belong to the surgeon (Rule 11) — this report never rules a case 'inoperable'.



SURGEON'S SIGNATURE & AI VERIFICATION

This report is clinical decision support; the plan is finalised by surgeon approval. Signature: _____ Date: _____

CONFIRMED