



Blepharitis

Meibomian Glands Dysfunction

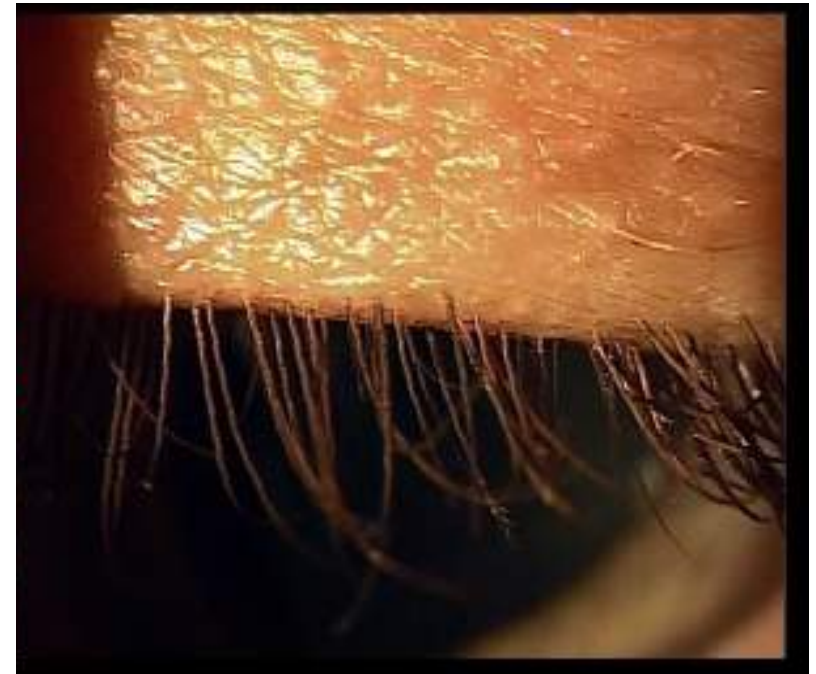


Blepharitis

Meibomian Glands Dysfunction (MGD)



Eyelid with blepharitis

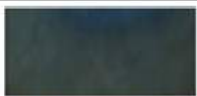
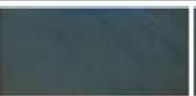
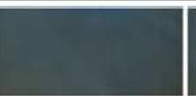
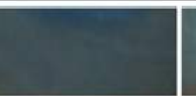
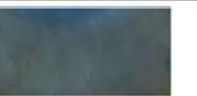
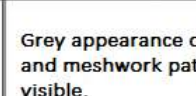
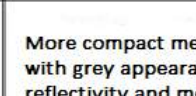
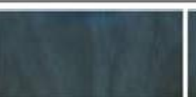
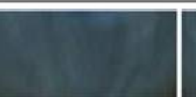
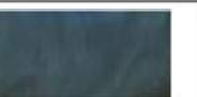
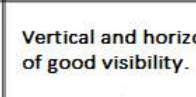
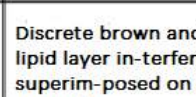


Healthy eyelid



Blepharitis

Scale of lipid layer

Sample image	Regions of interest (ROIs) from 10 different						Appearance	Thickness
							Grey appearance of low reflectivity and meshwork pattern faintly visible.	~13-15 nm
							More compact meshwork pattern with grey appearance of average reflectivity and more lipid than open meshwork.	~ 30-50 nm
							Vertical and horizontal grey waves of good visibility.	~ 50-80 nm
							Discrete brown and blue well-spread lipid layer in-terference fringes superim-posed on a whitish back-ground.	~ 90-140 nm



Blepharitis

Scale for secretion

Grade scale for meibomian gland dysfunction		
Grade Scale	Percentage of blocked glands	Quality of meibomian secretion
Grade 1	40% - 50%	Clear to mild milky secretion
Grade 2	50% - 70%	Milky to pasty secretion
Grade 3	70% - 85%	Thick, pasty to very little secretion
Grade 4	85% - 90%	Very little to no secretion

Source: J Lee



Blepharitis

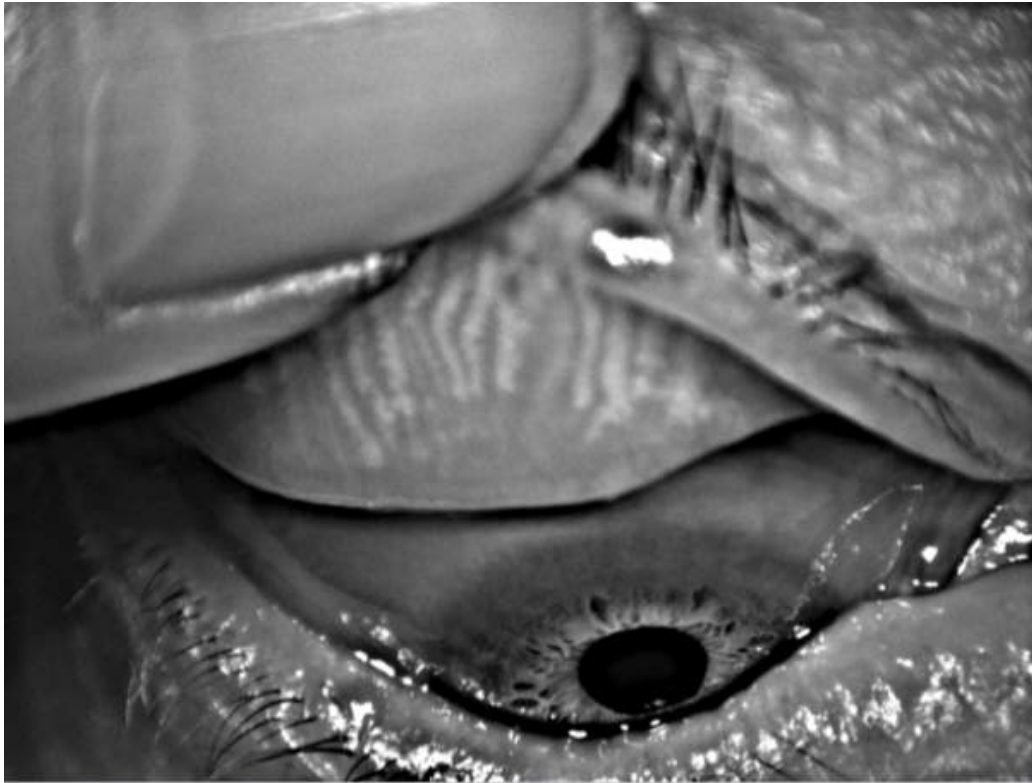
Case Report 01

- Men, age 73 years
- **Anamnesis:**
 - Blepharitis, Erysipel, Hypertension, Ectropium
- **Allergy:**
 - Mesocain, Novalgin, Sauerkraut
- **Treatment:**
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment
- **Objective opinion:**
 - The condition is much better
 - Doesn't close either eye, the right a little worse, but overall improved
 - Both the BUT and the lipid layer improved
- **Subjective opinion:**
 - Overall improvement
 - Doesn't close either eye
 - Improvement of BUT and lipid layer
 - Overall satisfaction



Blepharitis

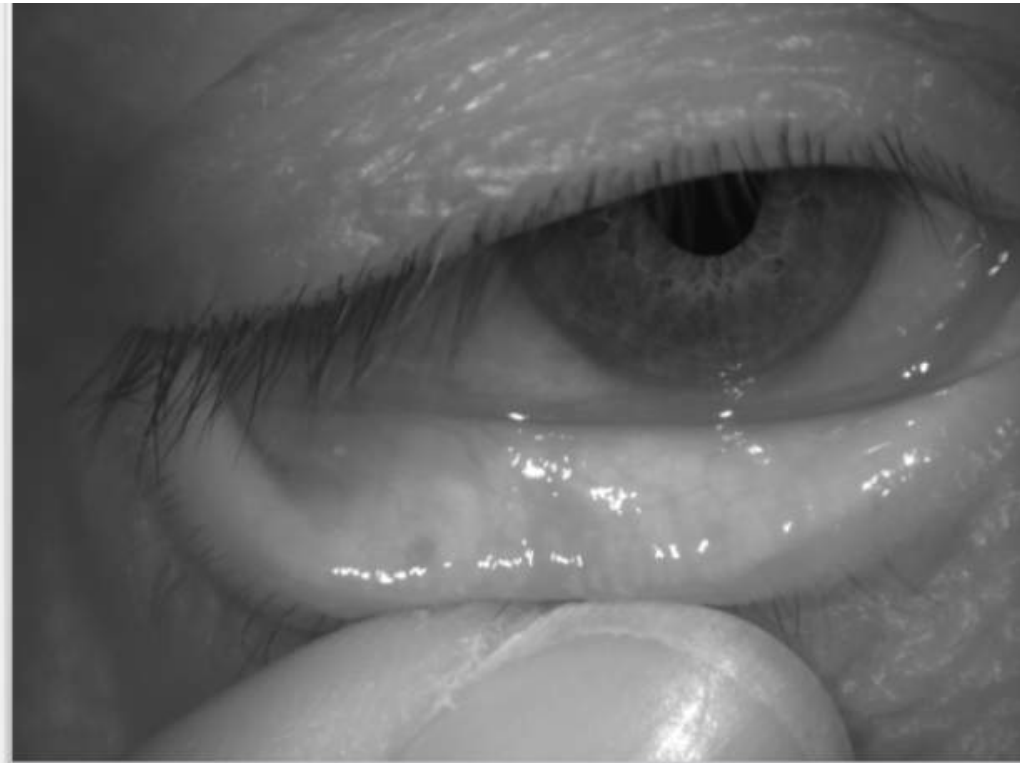
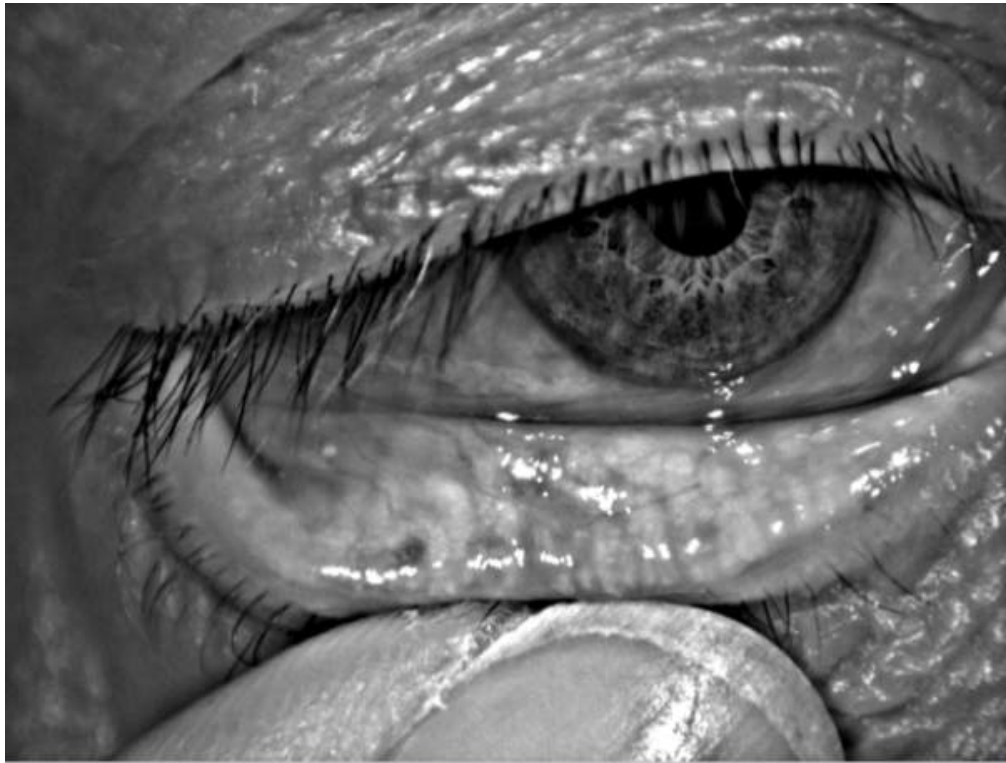
Case Report 01 (OD) – Meibomian Glands – upper eyelid





Blepharitis

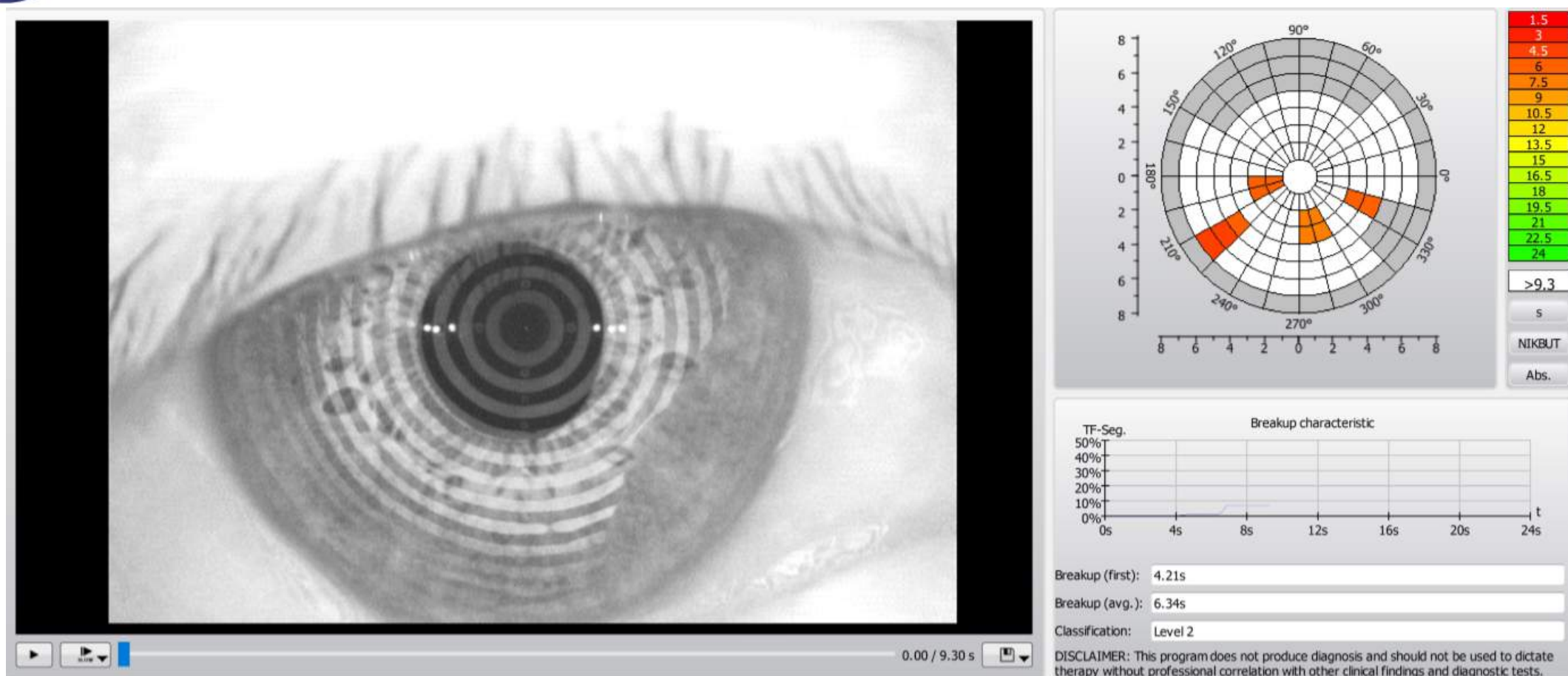
Case Report 01 (OD) – Meibomian Glands – lower eyelid





Blepharitis

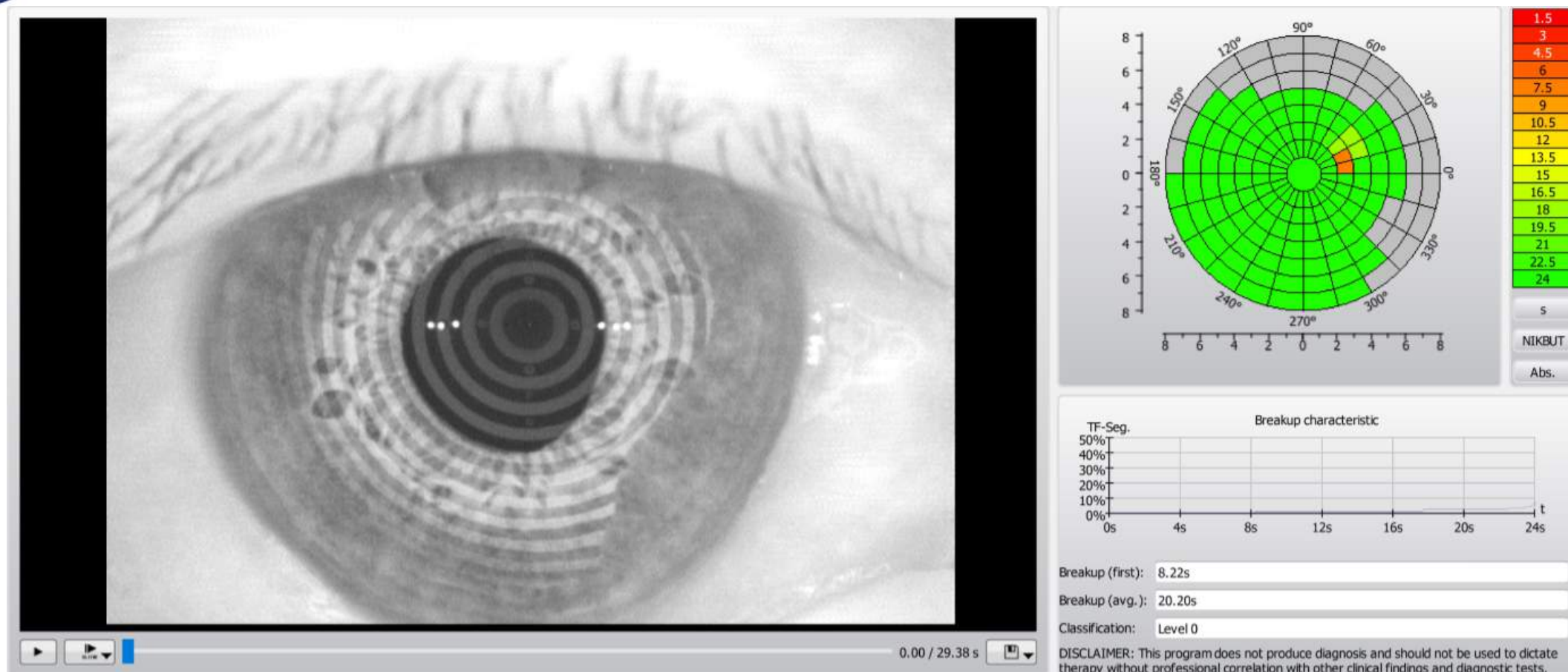
Case Report 01 (OS) – Keratograph – BUT- Before





Blepharitis

Case Report 01 (OS) – Keratograph – After





Blepharitis

Case Report 01 (OS) – Meibomian secretion before





Blepharitis

Case Report 01 (OS) – Meibomian secretion after 7 days





Blepharitis

Case Report 01 (OS) – Meibomian secretion after 1 month





Blepharitis

Case Report 01 (OS) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
R	0,44	0,42	0,41	0,32	0,31	0,4	0,29	0,32	0,31	0,35	0,38	0,34
L	0,49	0,55	0,43	0,25	0,34	0,26	0,4	0,49	0,36	0,31	0,31	0,41
BUT- tear film decay, total average												
R	12,55			17,96			14,79			18,11		
L	13,38			10,33			16,55			15,31		
BUT - tear film decay, average												
R	5,71			7,98			6,73			8,94		
L	5,27			2,84			8,76			8,41		
Lipid layer - thickness (the higher the better)												
R	13-15			30-50			30-50			50-80		
L	13-15			30-50			30-50			30-50		
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	2,3 2,0		1,4 1,2	1,3 2,1		0,8 1,0	1,3 2,9		0,8 1,6	1,3 2,5		0,8 1,3
L	1,8 1,8		1,0 0,8	1,9 1,3		1,0 0,6	2,7 1,7		2,2 0,8	2,3 1,2		1,1 0,7
Meimbom. Glands - degree (0. healthy - 4. significant decrease)												
R UPPER	2			2			2			2		
L UPPER	3			3			3			3		
R LOWER	3			3			3			3		
L LOWER	3			3			3			3		



Blepharitis

Case Report 01 (OS) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL OF EYELID AND SURROUNDING				
L	eyelids calm, fine	all right	all right	all right
R				
CLOSING THE EYELIDS				
R	does not close	does not close	does not close	does not close
L	does not close	does not close	does not close	does not close
CONTROL OF EYELASHES - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	eyelashes fine, without problem	fine	fine	fine
L				
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	no	no	no	no
L				
EXPRESIBILITY OF GLANDS - QUANTITY AND QUALITY				
R	2 upper, 4 lower	upper eyelid 1, lower 4	upper eyelid 1, lower 4	upper eyelid 1 but milky, lower 4
L				



Blepharitis

Case Report 02 (OD)

- Man, age 76 years
- **Anamnesis:**
 - Sicca syndrome, Hypertension, Hypercholesterolemia, Artefakia, age-related macular degeneration
- **Allergy:**
 - Metals
- **Treatment:**
 - Had had the treatment twice before it was controlled – satisfied
 - They were treated only upper eyelids
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment
- **Objective opinion:**
 - BUT objectively slightly increased, the rest remained the same
 - Secretion still the same yellow, still clogged glands
- **Subjective opinion:**
 - Does not perceive the condition as an improvement



Blepharitis

Case Report 01 (OD) – Meibomian Glands – upper eyelid





Blepharitis

Case Report 01 (OD) – Meibomian Glands – lower eyelid





Blepharitis

Case Report 02 (OD) – Before application





Blepharitis

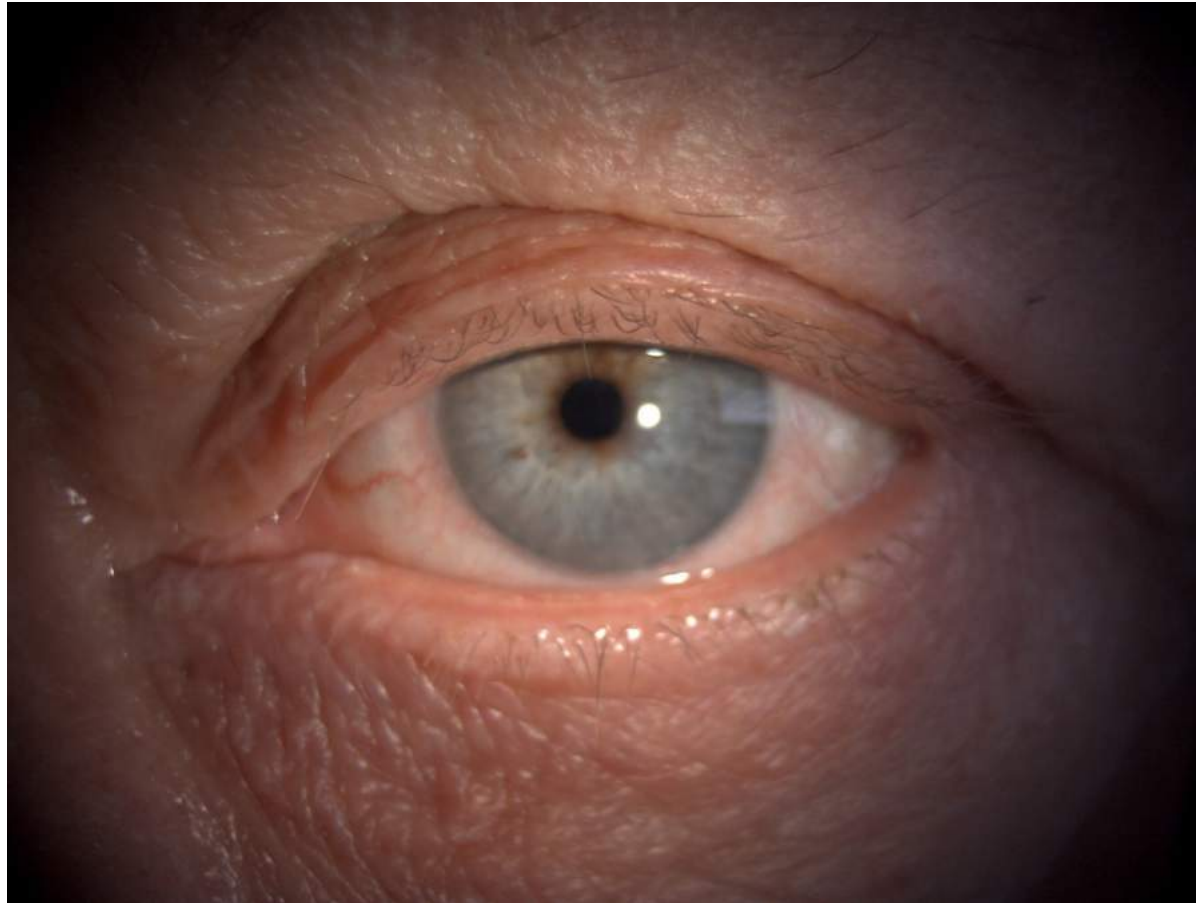
Case Report 02 (OD) – After 2nd applications, before 3rd application





Blepharitis

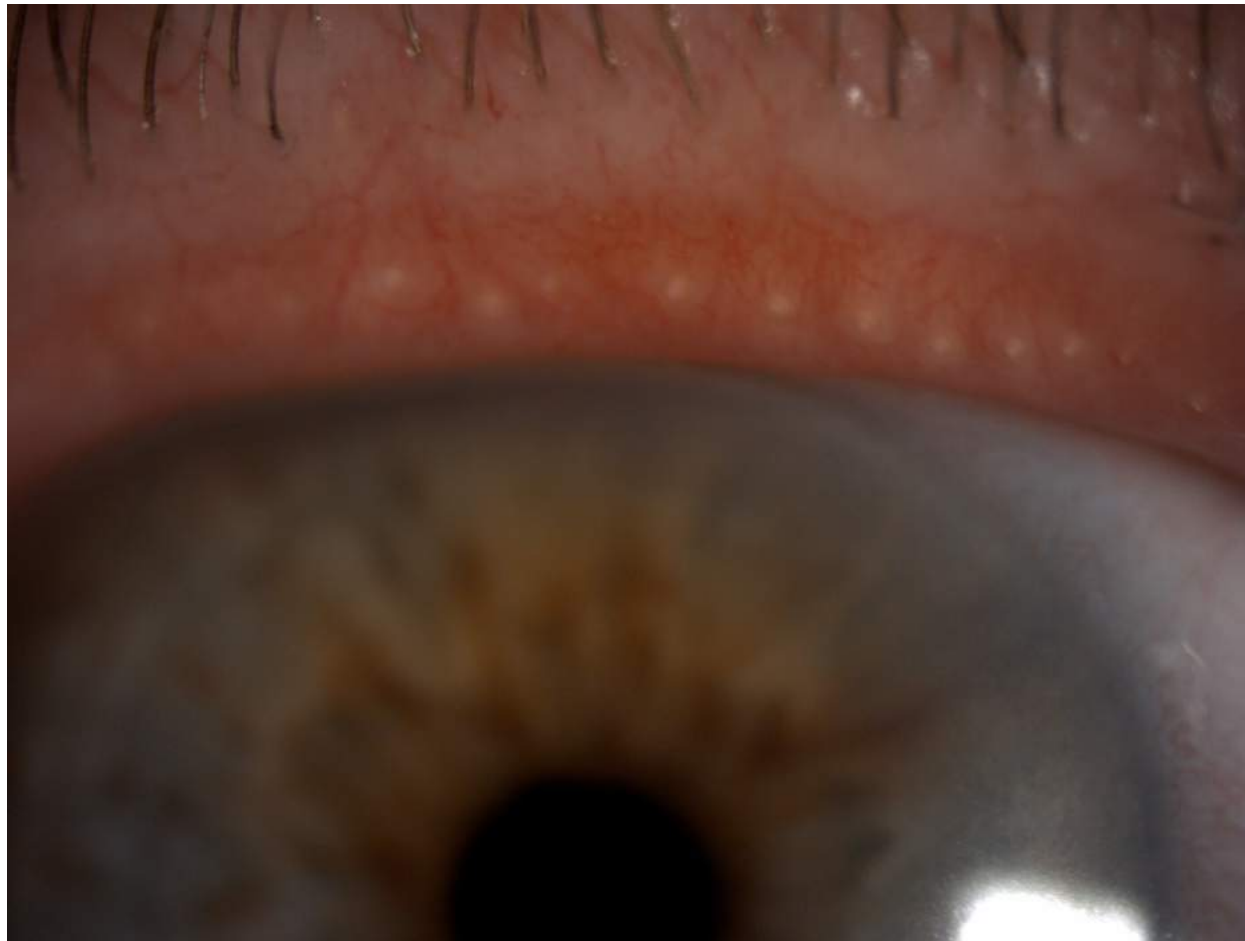
Case Report 02 (OD) – 1 month after 3rd application





Blepharitis

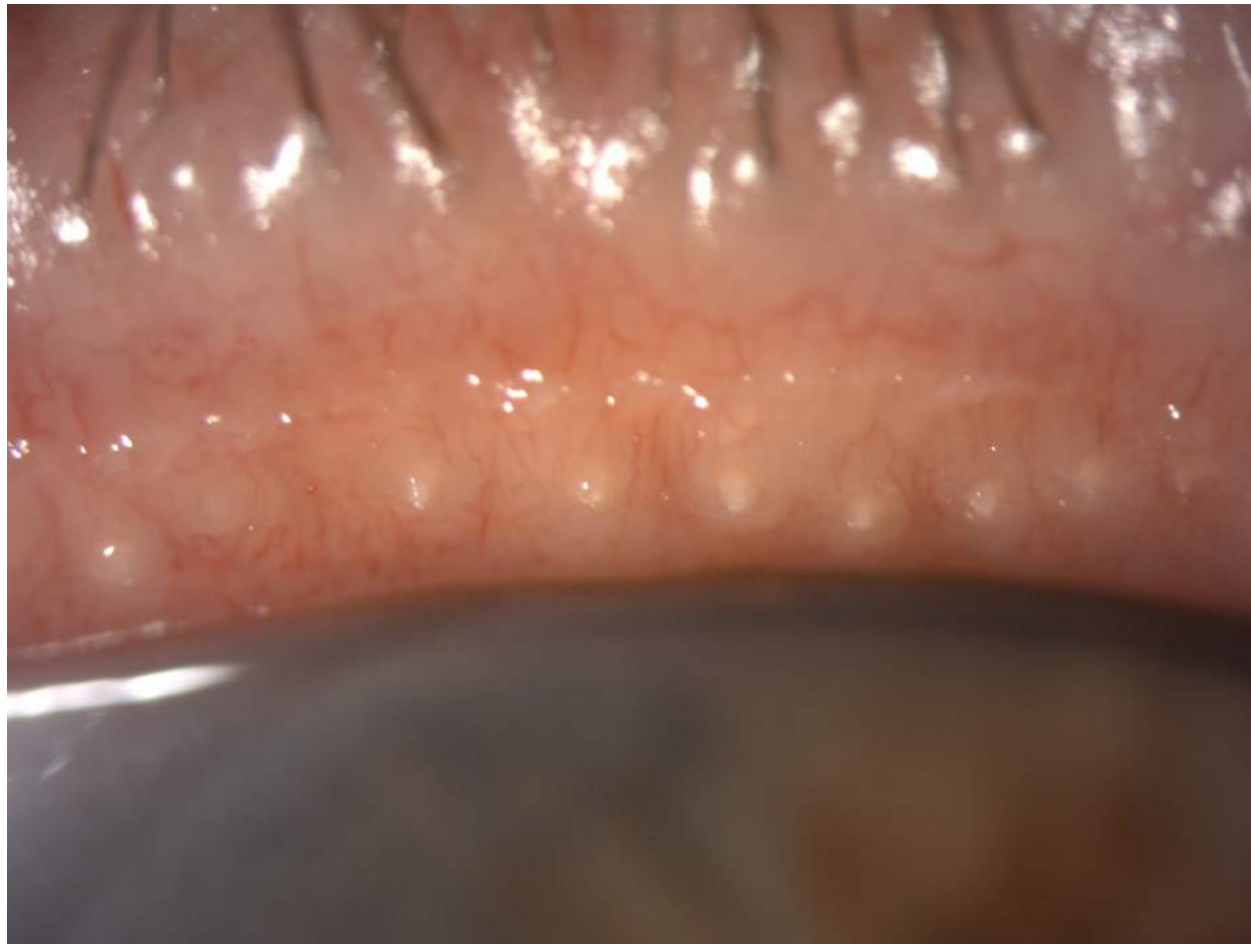
Case Report 02 (OD) – Meibomian secretion before the 3rd application





Blepharitis

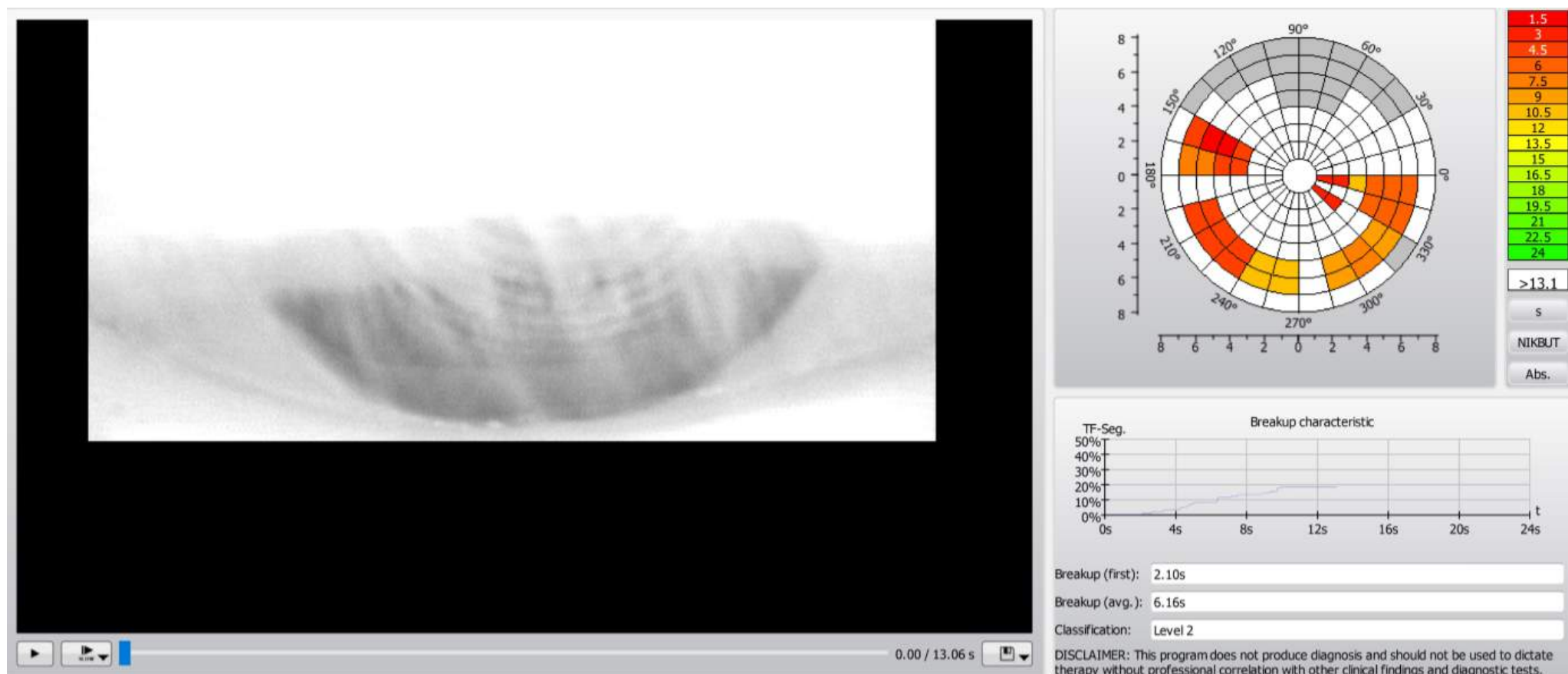
Case Report 02 (OD) – Meibomian secretion 1 month after 3rd application





Blepharitis

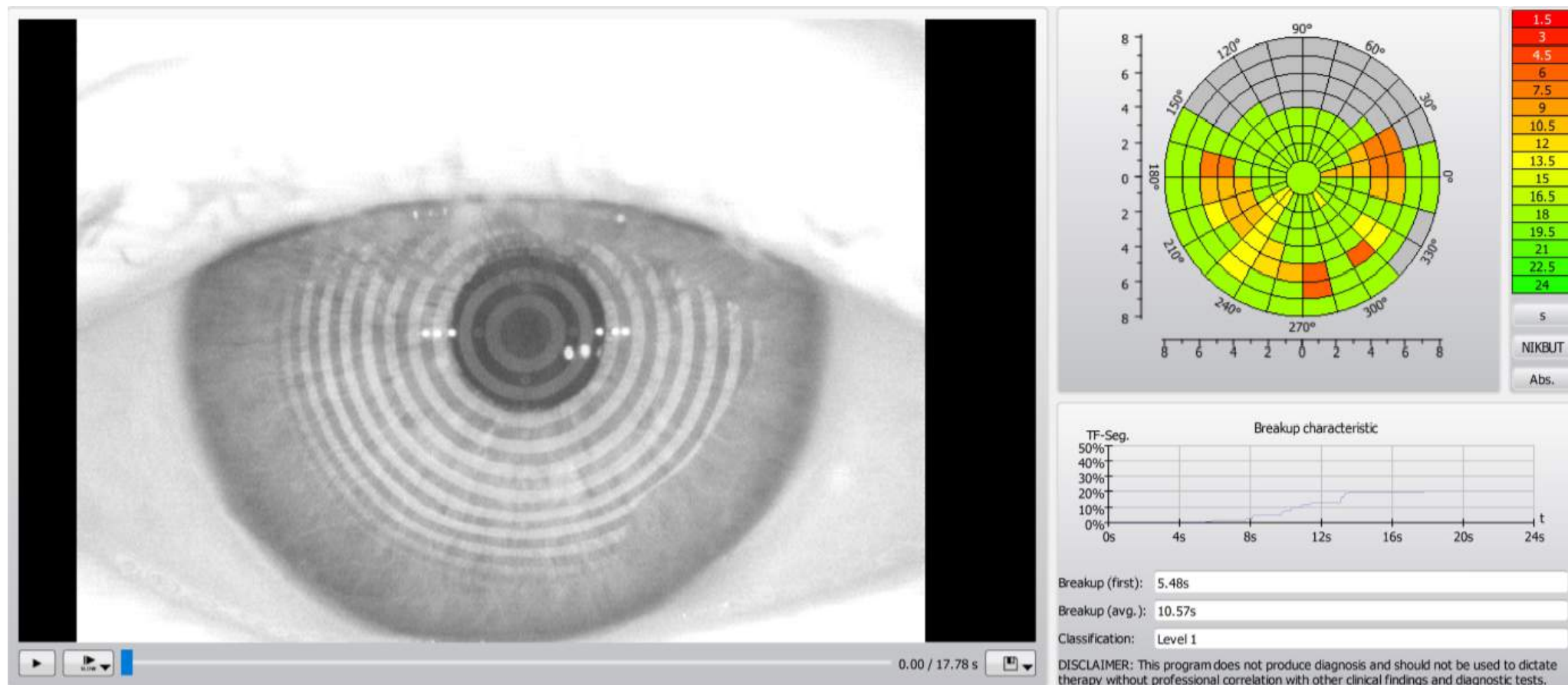
Case Report 02 (OD) – Keratograph BUT – Before





Blepharitis

Case Report 02 (OD) – Keratograph BUT – After 1 month





Blepharitis

Case Report 02 (OD) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
L	47	36	36	38	40	47	66	55	47	0,35	0,31	0,29
R	33	41	39	28	30	44	31	36	50	0,24	0,31	0,51
BUT- tear film decay, total average												
R	8,5			9,82			9,03			8,69		
L	5,8			7,83			7,8			4,72		
BUT - tear film decay, average												
R	2,55			4,43			4,95			4,37		
L	3,42			3,95			4,73			4,715		
Lipid layer - thickness (the higher the better)												
R	13-15			13-15			13-15			13-15		
L	13-15			13-15			13-15			13-15		
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	1,3 1,8		1,0 1,8	1,4 1,1		0,7 1,1	0,9 1,4		0,7 1,0	1,8 2,6		1,8 2,8
L	1,8 2,4		1,3 1,9	1,6 1,6		1,2 0,9	1,3 1,4		1,0 0,8	1,6 2,1		1,4 1,3
Meimbom. Glands - degree (0. healthy - 4. significant decrease)												
R UPPER	3			3			3			3		
L UPPER	3			3			3			3		
R LOWER	3			3			3			3		
L LOWER	3			3			3			3		



Blepharitis

Case Report 02 (OD) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL OF EYELIDS AND SURROUNDING				
L	Eyelids calm	Eyelids calm	Eyelids calm	Eyelids calm
R				
CLOSING OF EYELIDS				
R	yes	yes	yes	yes
L	yes	yes	yes	yes
CONTROL OF EYELIDS - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	no	no	no	no
L	no	no	no	no
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	no	no	no	no
L	no	no	no	no
EXPRESIBILITY OF GLANDS - QUANTITY AND QUALITY				
R	3 upper, 2 lower	3 upper, 2 lower	3 upper, 2 lower	3 upper and lower
L				



Blepharitis

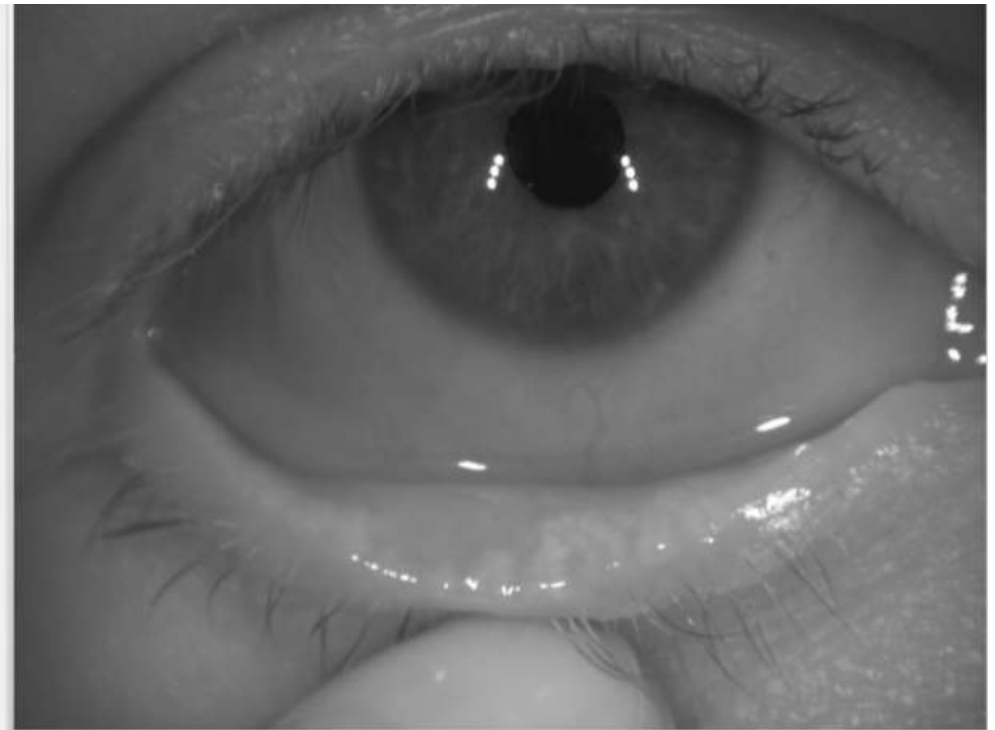
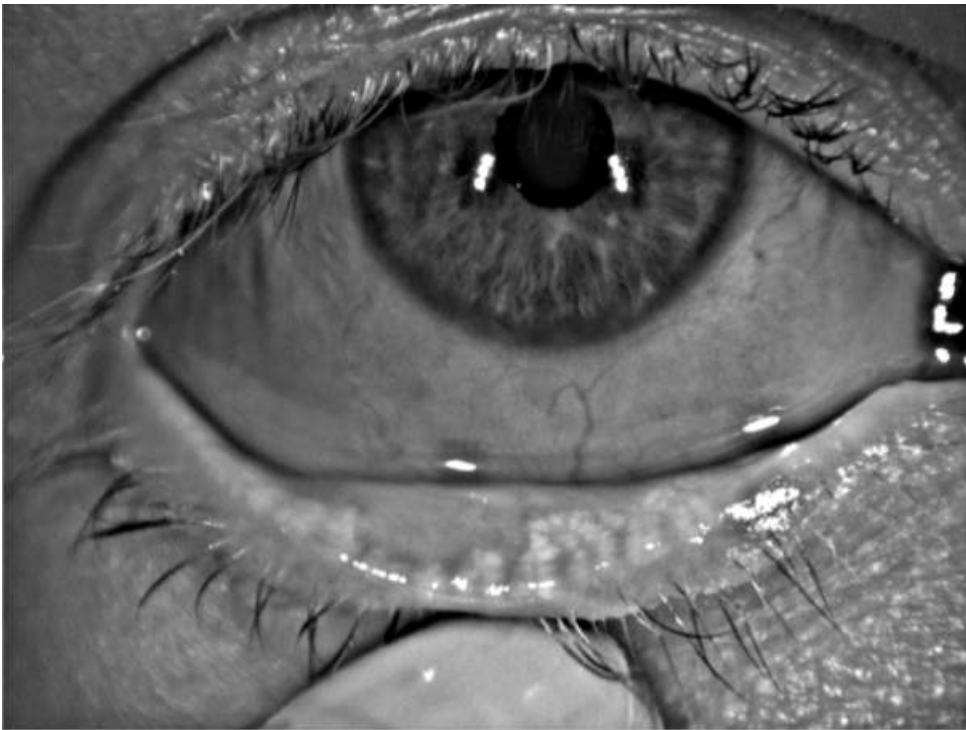
Case Report 03 (OD)

- Man, age 34 years
- **Anamnesis:**
 - Meibomitis, **Rosacea** (may affect the success of treatment), Demodex
- **Allergy:** none
- **Treatment:**
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment
- **Objective opinion:**
 - Right eye better than left
 - BUT still better than before treatment
 - Expression still nice
- **Subjective opinion:**
 - The gent perceives everything in order, subjectively getting better than before application
 - Still a little redness, but less than before



Blepharitis

Case Report 03 (OD) – Meibomian Glands – lower eyelid





Blepharitis

Case Report 03 (OD) – Meibomian Glands – upper eyelid





Blepharitis

Case Report 03 (OD) - Meibomian secretion before





Blepharitis

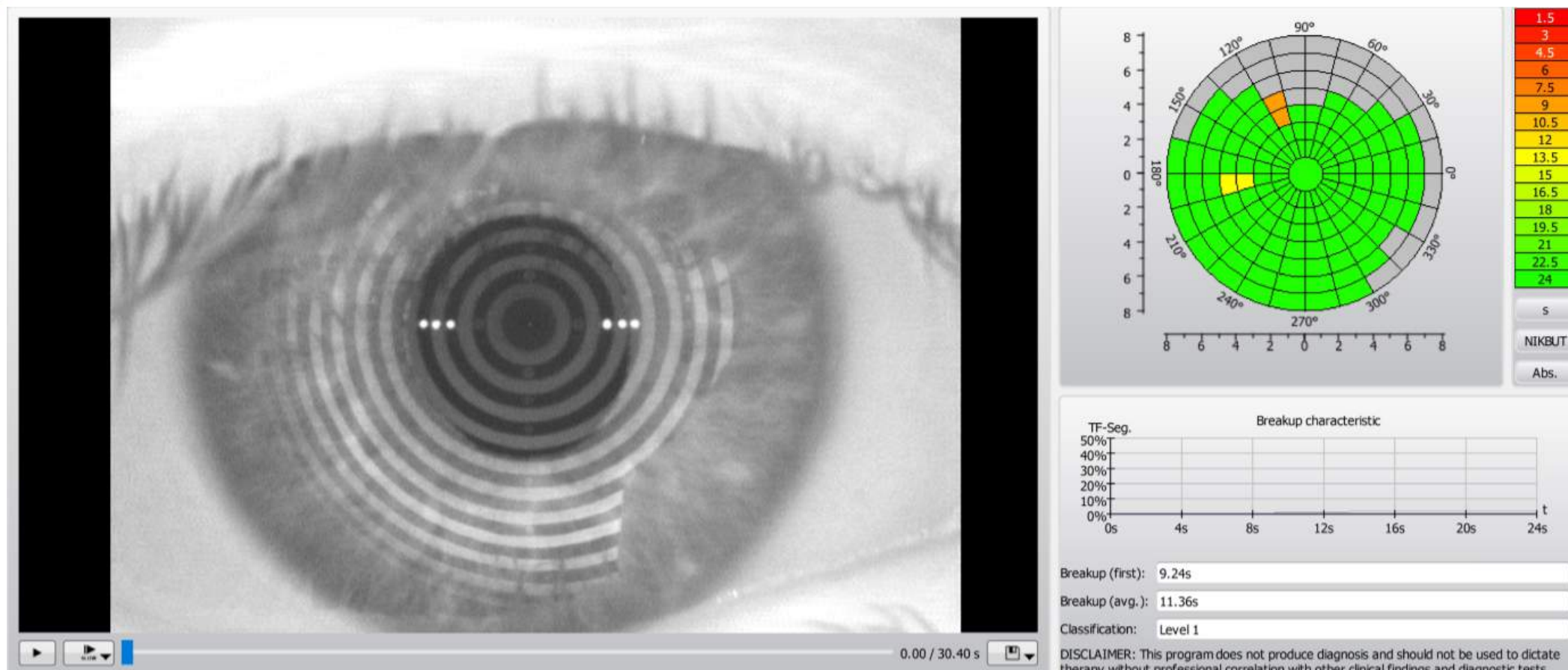
Case Report 03 (OD) – Meibomian secretion after 1 month





Blepharitis

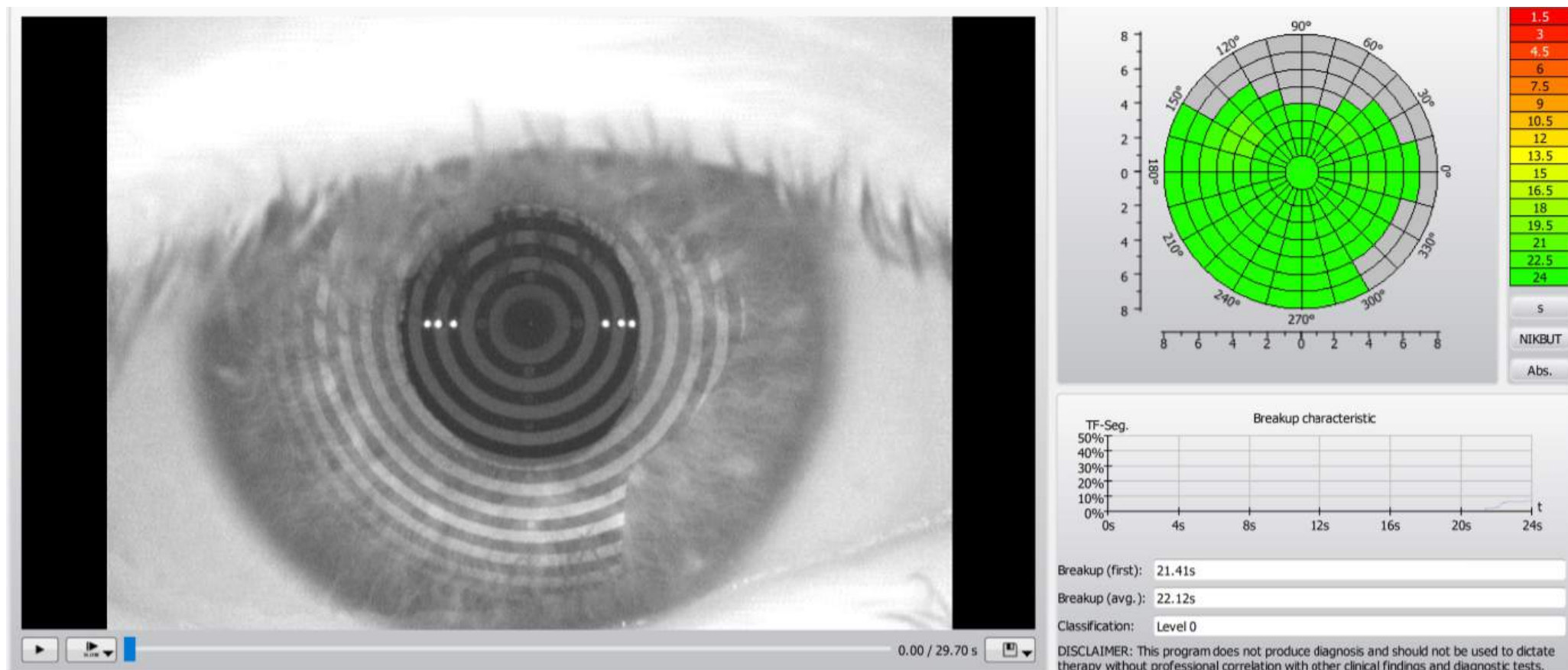
Case Report 03 (OD) – Keratograph BUT – Before





Blepharitis

Case Report 03 (OD) – Keratograph BUT – After 1 month





Blepharitis

Case Report 03 (OD) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
L	0,43	0,52	0,46	0,32	0,42	0,41	0,38	0,23	0,29	0,3	0,36	0,34
R	0,38	0,43	0,44	0,29	0,38	0,38	0,25	0,23	0,25	0,29	0,34	0,29
BUT- tear film decay total average												
R	19,78			20,78			22,03			20,78		
L	19,77			19,03			16,03			19,03		
BUT -tear film decay, average												
R	18,41			20,11			20,24			20,78		
L	8,24			11,85			10,2			11,85		
Lipid layer - thickness (the higher the better)												
R	30-50			50-80			90-140			30-50		
L	13-15			30-50			90-140			13-15		
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	0,5 0,5		0,4 0,3	0,6 1,1		0,5 0,8	0,5 1,4		0,4 0,8	0,6 1,1		0,5 0,8
L	1,5 1,6		1,0 1,4	1,8 0,7		0,8 0,5	1,6 0,6		1,0 0,9	1,8 0,7		0,8 0,5
Meimbom. Glands - degree (0. healthy - 4. significant decrease)												
R UPPER	4			4			4			4		
L UPPER	4			4			4			4		
R LOWER	3			3			3			3		
L LOWER	3			3			3			3		



Blepharitis

Case Report 03 (OD) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL OF EYELID AND SURROUNDING				
L	Eyelashes glued a lot, red eyes, both eyes affected similarly		significant improvement, eyelashes less glued, eyes less red	eyelashes glued in a few places, eyes less red
R				
CLOSING OF EYELID AND SURROUNDING				
R	yes	yes	yes	yes
L	yes	yes	yes	yes
CONTROL OF EYELASHES - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	no	no	no	no
L	no	no	no	no
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	yes, lightly		yes, less than before	yes, less than before
L	yes, lightly		yes, less than before	yes, less than before
EXPRESIBILITY OF GLANDS - QUANTITY AND QUALITY				
R	2 everywhere	1 everywhere	1, grain was formed on the left eye	1 everywhere, except the left upper eyelid- there 2
L				



Blepharitis

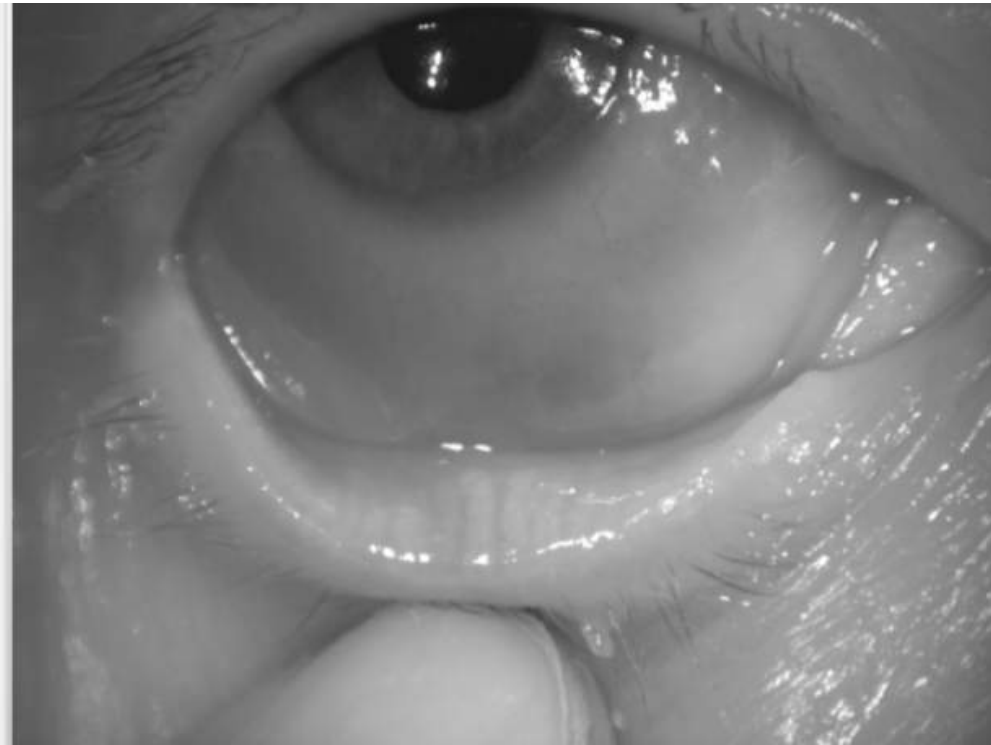
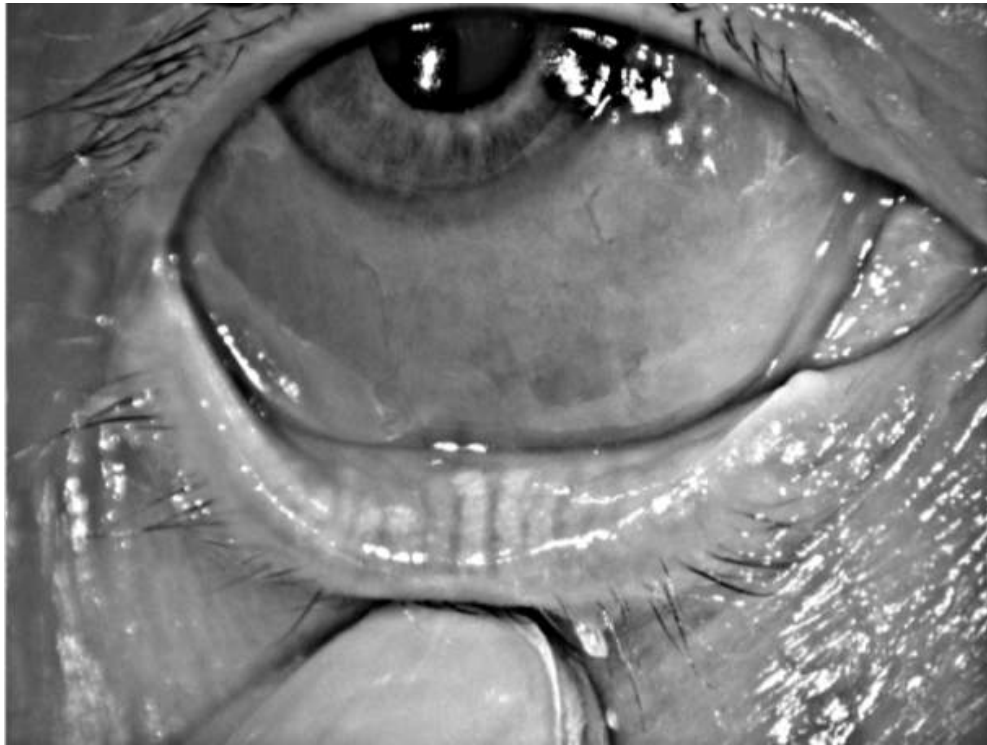
Case Report 04 (OD)

- Woman, age 80 years
- **Anamnesis:**
 - Sicca syndrom, Meibomiana, Epitelopatia cornea, **Keratitis punctata** (the left eye could not be measured), Stroke (2006)
- **Allergy:** none
- **Treatment:**
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment
- **Objective opinion:**
 - Secretion greater, nicely clear
 - The lipid layer is always the same
- **Subjective opinion:**
 - Subjective feelings better



Blepharitis

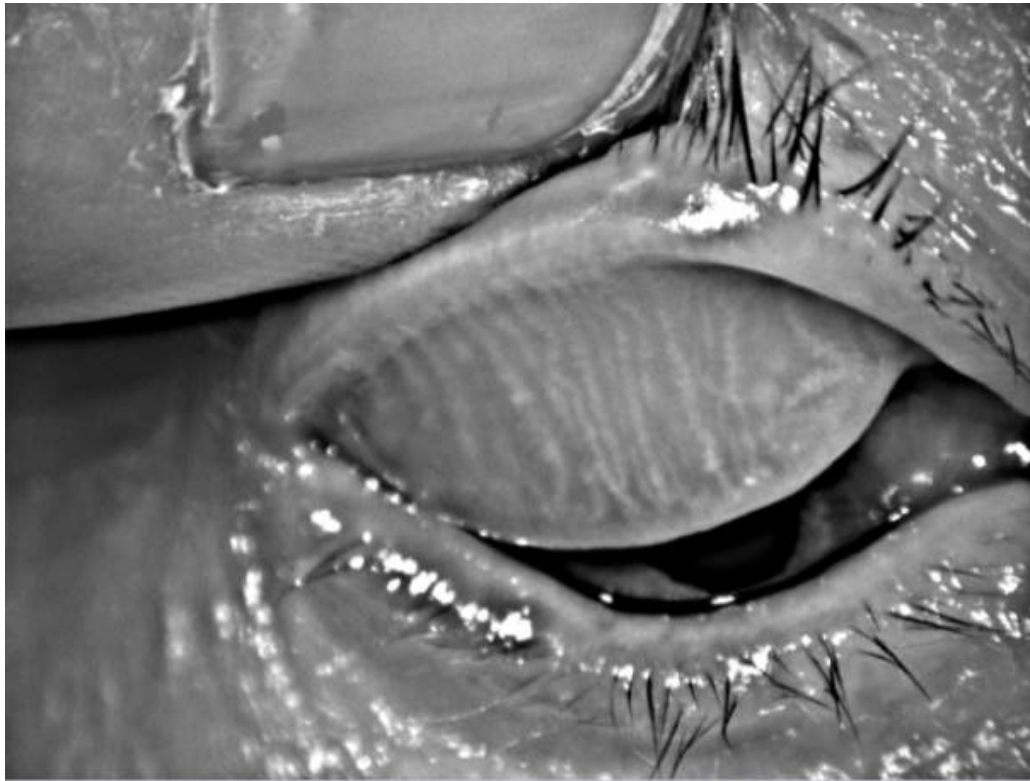
Case Report 04 (OD) – Meibomian Glands – lower eyelid





Blepharitis

Case Report 04 (OD) – Meibomian Glands – upper eyelid





Blepharitis

Case Report 04 (OD) – Meibomian secretion before





Blepharitis

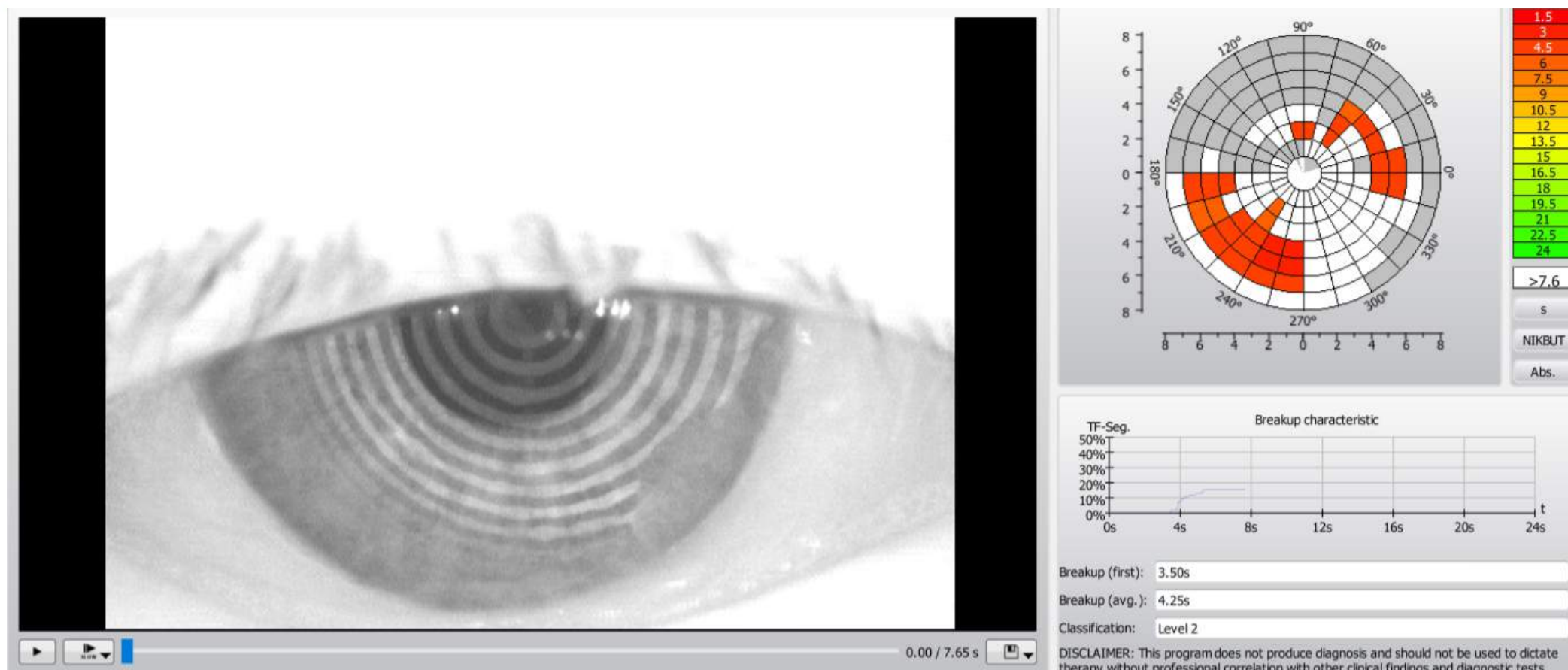
Case Report 04 (OD) – Meibomian secretion after 1 month





Blepharitis

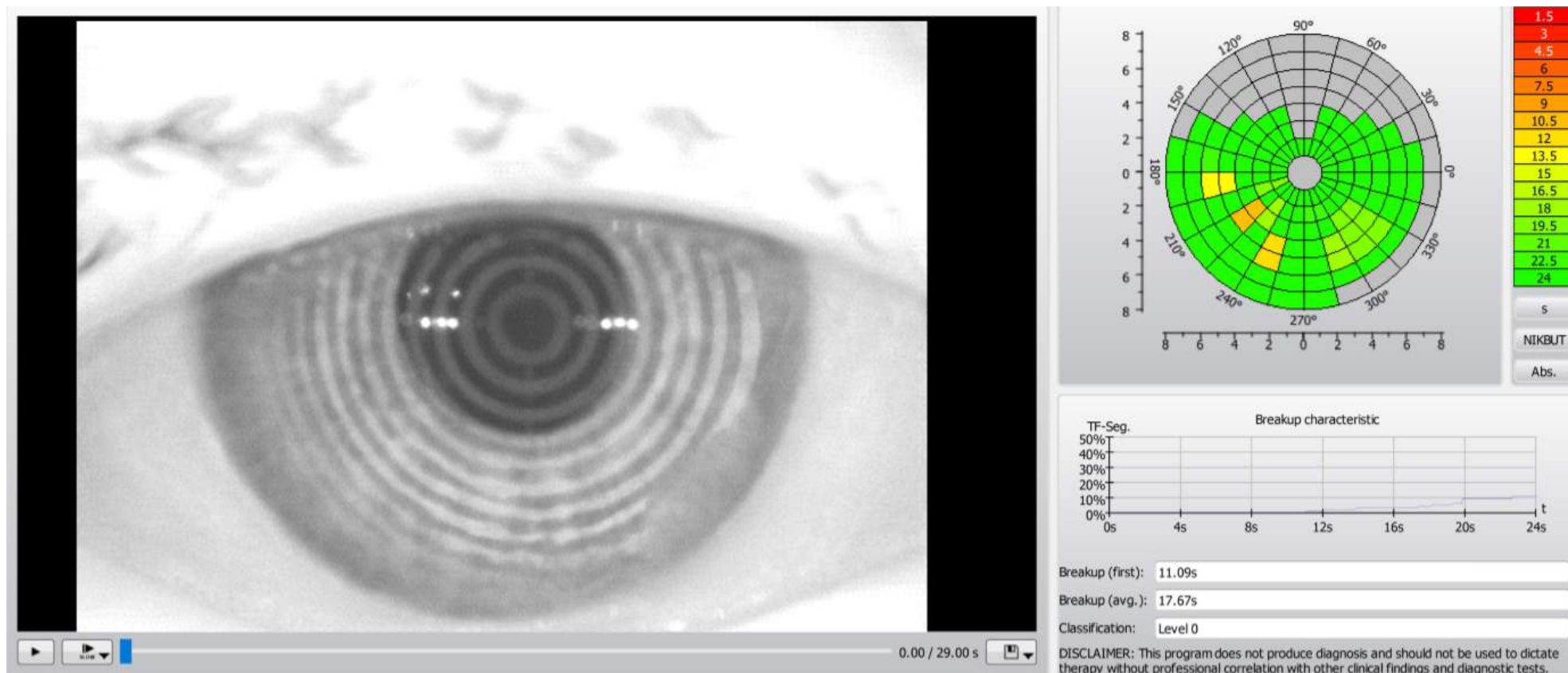
Case Report 04 (OD) – Keratograph BUT – Before





Blepharitis

Case Report 04 (OD) – Keratograph BUT – After 1 month





Blepharitis

Case Report 04 (OD) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
L	72	42	33	37	29	25	50	38	42	50	94	67
R	46	53	54	40	55	49	52	56	49	51	35	45
BUT - tear film decay, total average												
R	13,46			12,5			15,17			16,33		
L	15,96			cannot			cannot			11,135		
BUT - tear film decay, average												
R	4,27			6,41			7,35			7,37		
L	7,96			cannot			cannot			5,96		
Lipid layer - thickness (the higher the better)												
R	13-15			13-15			13-15			13-15		
L	13-15			13-15			13-15			13-15		
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	1,6 1,3		1,3 1,0	1,7 1,6		1,4 1,1	1,3 1,0		1,0 0,7	1,4 0,9		1,0 0,7
L	1,7 1,8		1,0 0,7	1,8 1,3		1,3 1,0	1,5 0,9		1,3 0,9	1,5 1,2		1,1 0,8
Meimbom. Glands - degree (0. healthy - 4. significant decrease)												
R UPPER	3			3			3			3		
L UPPER	2			2			2			2		
R LOWER	2			2			2			2		
L LOWER	3			3			3			3		



Blepharitis

Case Report 04 (OD) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL OF EYELID AND SURROUNDING				
L	eyes calm, uses eyeliner cream	eye calm, visible cream on eyelids and eyelashes	eyes calm	eyes calm, again cream on eyelashes
R				
CLOSING THE EYELIDS				
R	yes	yes	yes	yes
L	yes	yes	yes	yes
CONTROL OF EYELASHES - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	no	no	no	no
L	no	no	no	no
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	no	no	no	no
L	no	no	no	no
EXPRESIBILITY OF GLANDS - QUANTITY AND QUALITY				
R	1	1- more	1- more than befor	1
L				



Blepharitis

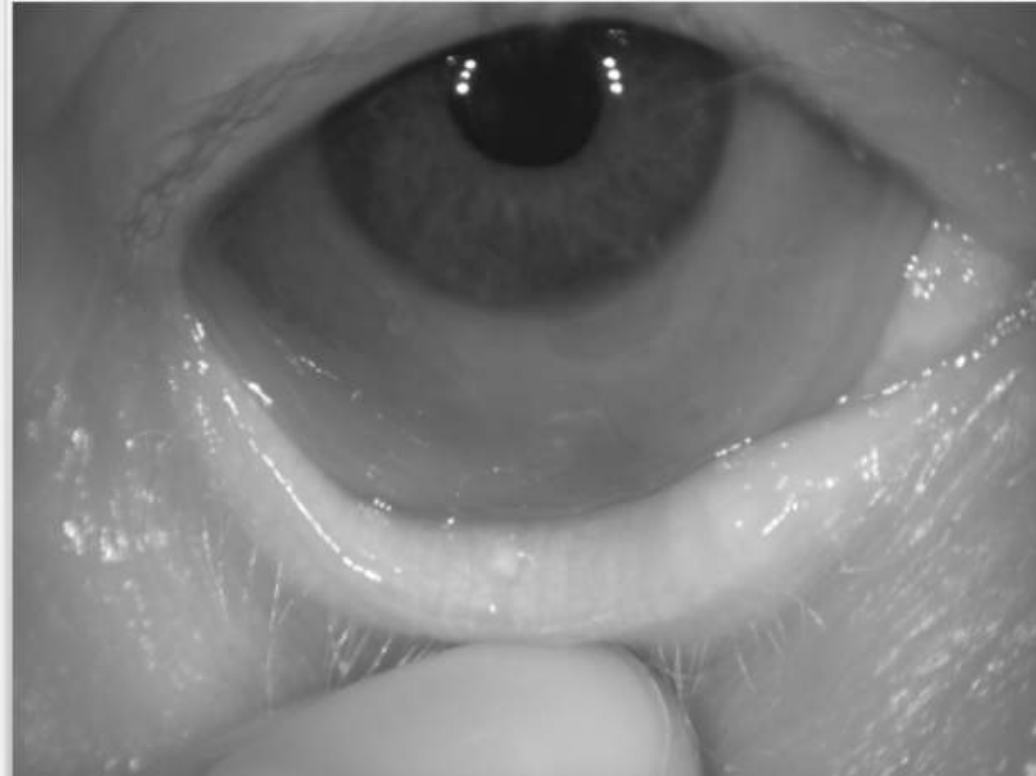
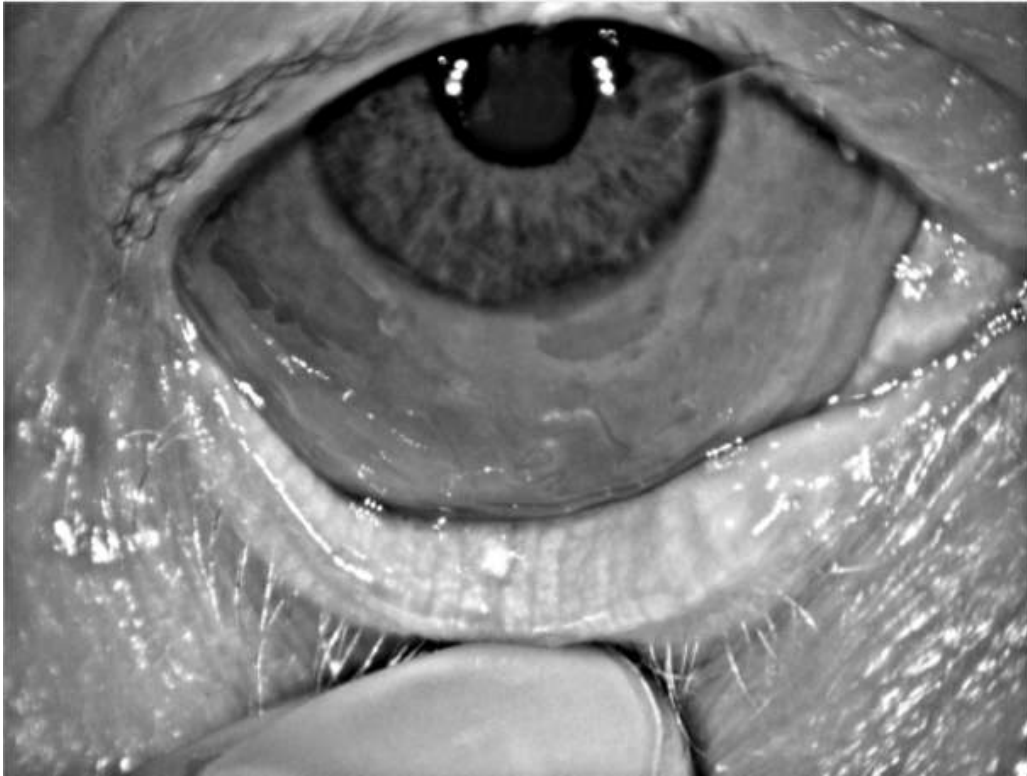
Case Report 05 (OS)

- Woman, age 74 years
- **Anamnesis:**
 - Hypertension, hypercholesterolemia, thyroid disease, after neck surgery for cancer
- **Allergy:** none
- **Treatment:**
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment
- **Objective opinion:**
 - Secretion better, clear and sufficient quantity
 - BUT left worse, right BUT better
 - Yet very dry eye
- **Subjective opinion:**
 - Nevertheless, the patient is satisfied



Blepharitis

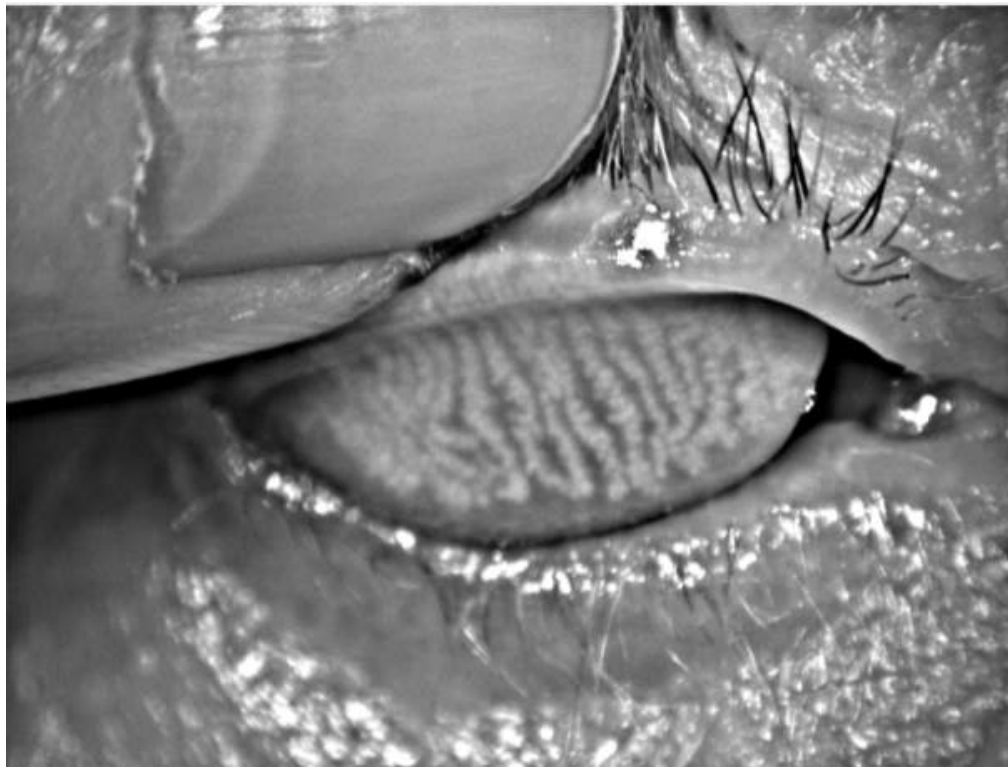
Case Report 05 (OD) – Meibomian Glands – lower eyelid





Blepharitis

Case Report 05 (OD) – Meibomian Glands – upper eyelid





Blepharitis

Case Report 05 (OS) – Meibomian secretion before





Blepharitis

Case Report 05 (OS) – Meibomian secretion after 14 days





Blepharitis

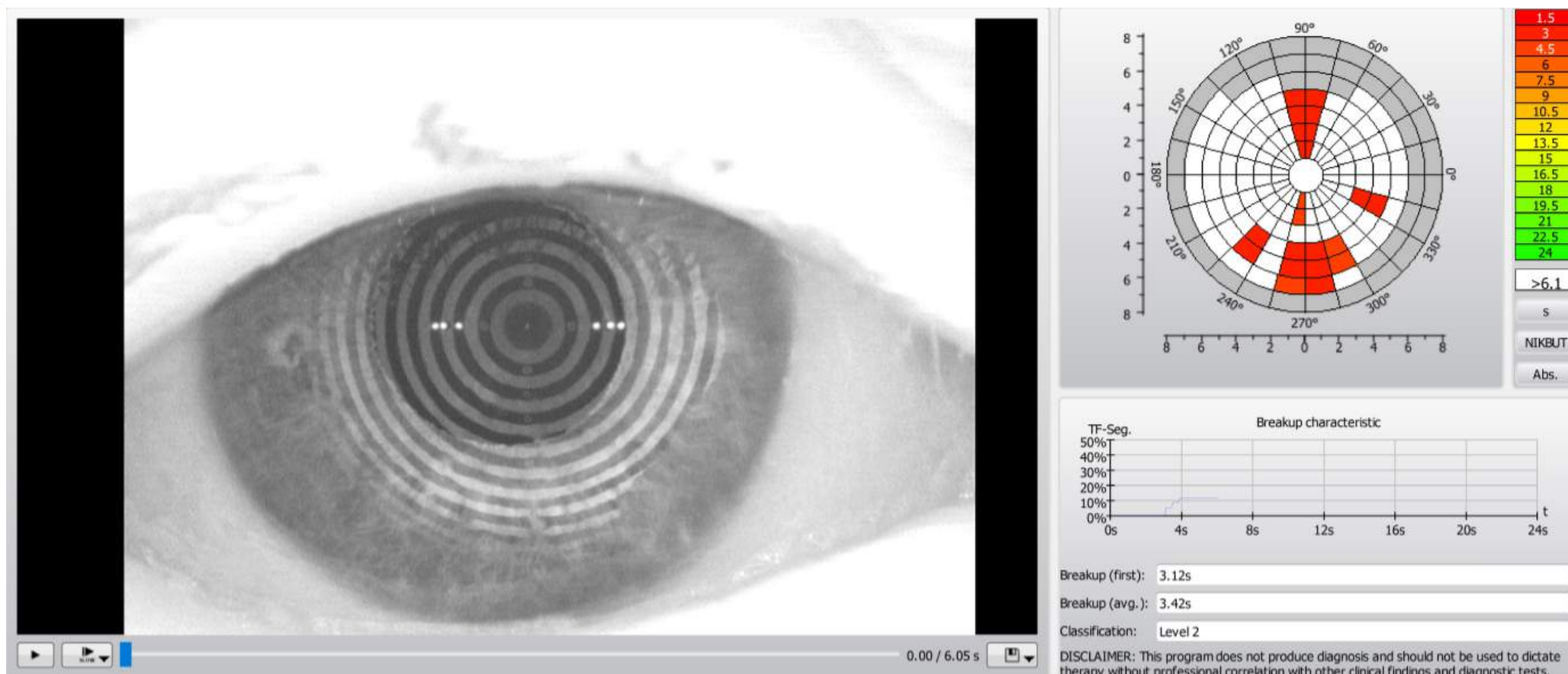
Case Report 05 (OS) – Meibomian secretion after 1 month





Blepharitis

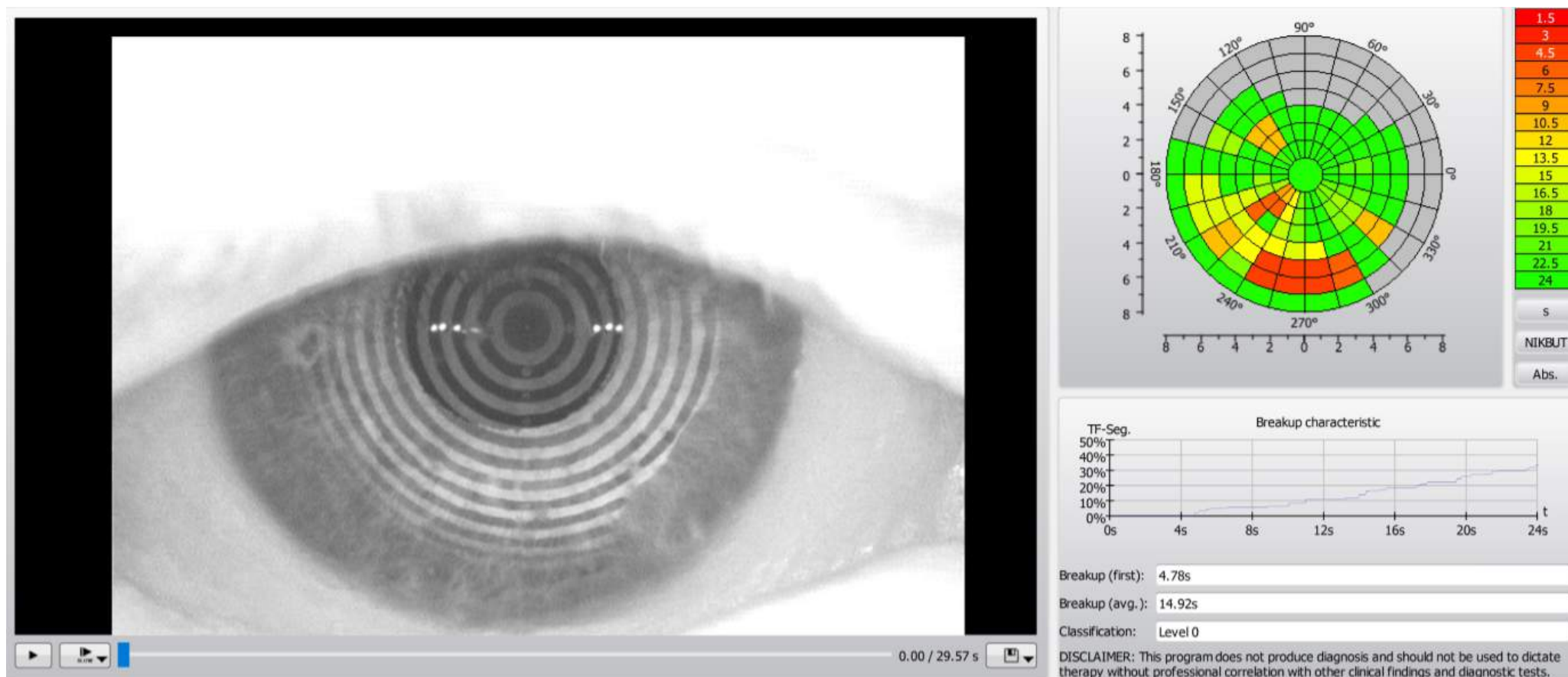
Case Report 05 (OD) – Keratograph BUT – Before





Blepharitis

Case Report 05 (OD) – Keratograph BUT – After 1 month





Blepharitis

Case Report 05 (OS) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
L	35	28	32	35	43	44	48	43	34	45	44	29
R	33	38	33	33	50	54	34	40	0,43	36	38	47
BUT - tear film decay, total average												
R	11,18			9,87			10,24			15,3		
L	10,16			13,23			2,94			5,03		
BUT - tear film decay, average												
R	6,94			4,14			2,65			3,05		
L	4,4			3,42			2,1			2,84		
Lipid layer - thickness (the higher the better)												
R	13-15			13-15			30-50			13-15		
L	13-15			30-50			13-15			13-15		
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	1,8 2,0		1,5 2,0	1,7 2,0		1,2 1,8	1,6 1,1		1,0 0,6	1,4 1,0		1,1 0,6
L	1,2 1,0		1,0 0,8	1,5 1,4		1,3 1,0	1,0 1,0		0,7 0,5	1,4 1,3		1,1 0,9
Meimbom. Glands - degree (0. healthy - 4. significant decrease)												
R UPPER	2			2			2			2		
L UPPER	2			2			2			2		
R LOWER	1			1			1			1		
L LOWER	2			2			2			2		



Blepharitis

Case Report 05 (OS) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL EYELID AND SURROUNDING				
L	eyes calm, without problem	eyes calm, without problem	eyes calm, without problem	on the lower L foaming - eyes calm, without problem
R				
CLOSING THE EYELIDS				
R	yes	yes	yes	yes
L	yes	yes	yes	yes
CONTROL OF EYELASHES - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	no	no	no	no
L	no	no	no	no
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	yes - a little	yes - a little	yes - a little	yes - a little
L	yes - a little	yes - a little	yes - a little	yes - a little
EXPRESIBILITY OF GLANDS - QUNTITY AND QUALITY				
R	1	1, improvement - clearer	1, clear, big	1, clear, big
L				



Blepharitis

Case Report 06 (OD)

- Woman, age 62 years
- **Anamnesis:**
 - Meibomitis, Demodex (trial of new demodex therapy with colloidal silver)
- Allergy:
 - Pollen, Sticking-plaster
- **Treatment:**
 - 1st control after 7 days
 - 2nd control after 14 days
 - 3rd control after 1 month after treatment (not yet)
- **Objective opinion:**
 - The lipid layer was thinned
 - BUT also got worse
 - Possible effect of colloidal silver therapies on demodex???
- **Subjective opinion:**
 - the patient is satisfied



Blepharitis

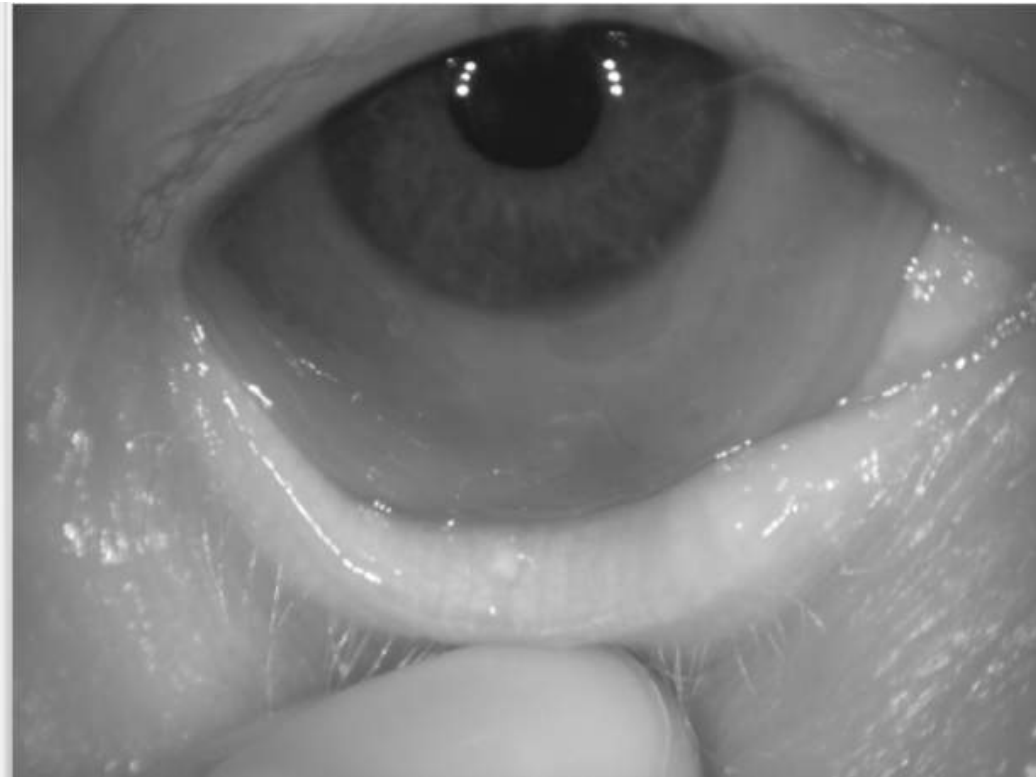
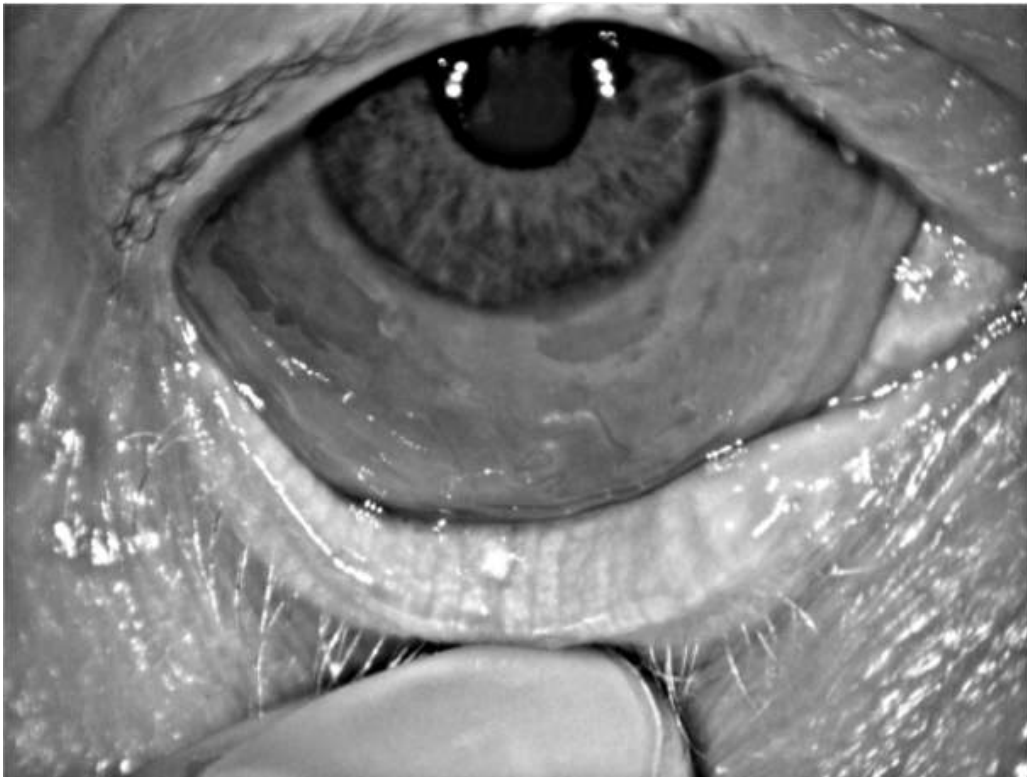
Case Report 06 (OD) – Meibomian Glands – upper eyelid





Blepharitis

Case Report 06 (OD) – Meibomian Glands – lower eyelid





Blepharitis

Case Report 07 (OD) – Meibomian secretion before





Blepharitis

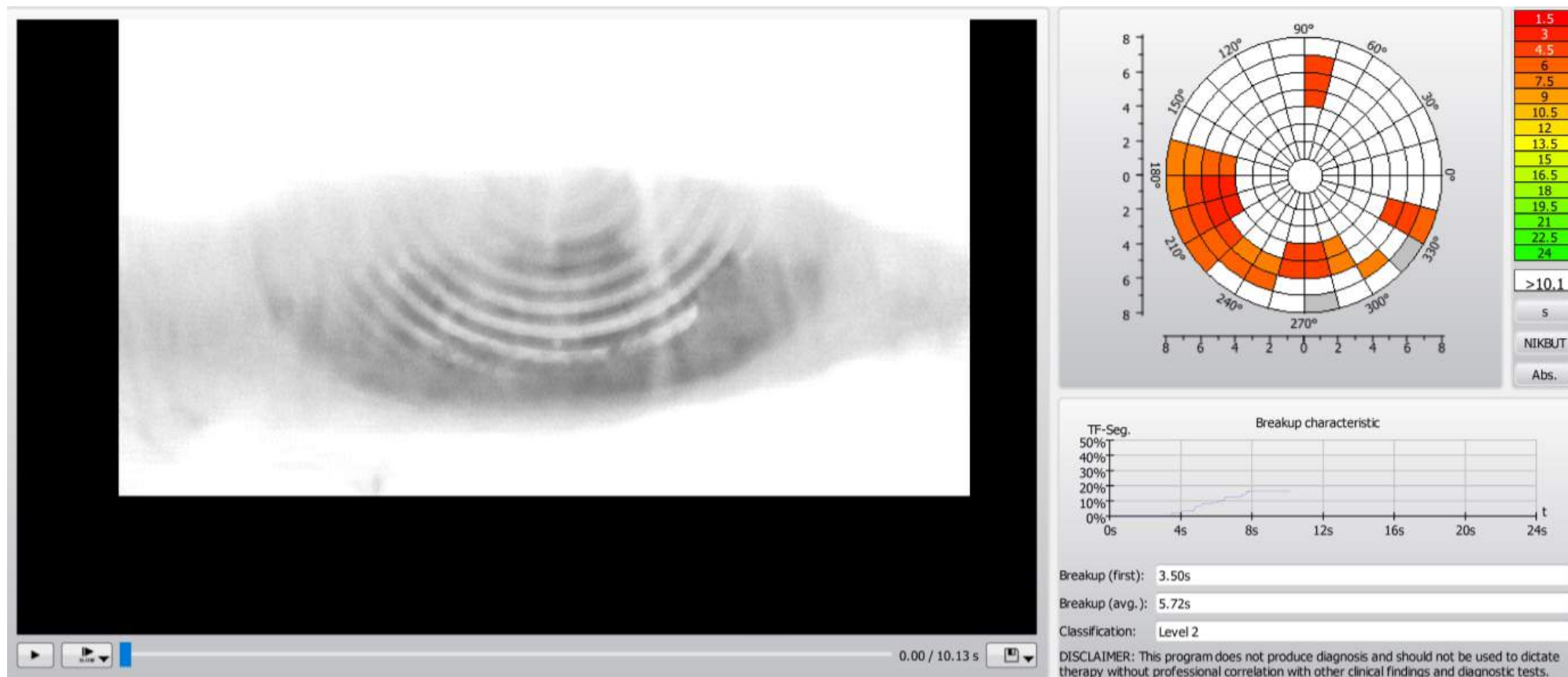
Case Report 07 (OD) – Meibomian secretion after 7 days





Blepharitis

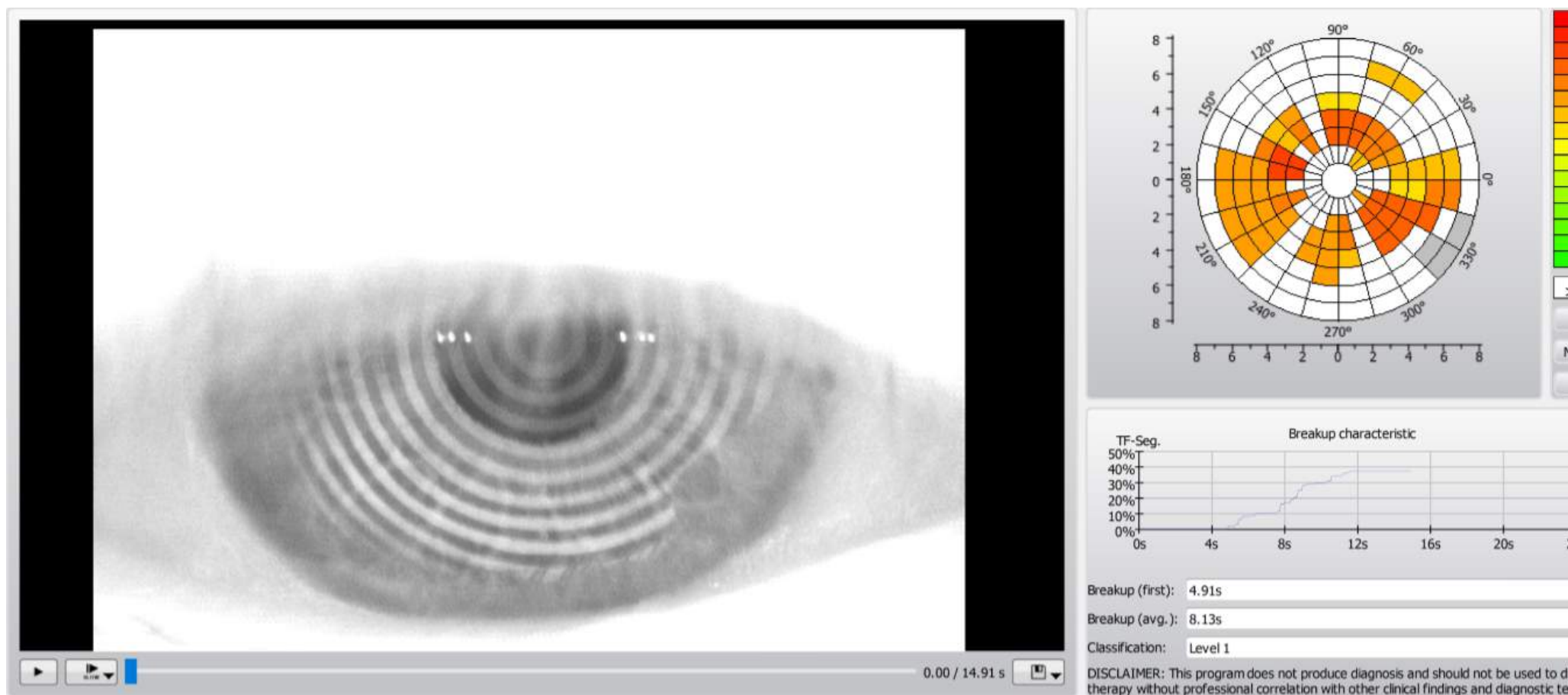
Case Report 07 (OD) – Keratograph – Before





Blepharitis

Case Report 07 (OD) – Keratograph – After 14 days





Blepharitis

Case Report 07 (OD) – Keratograph – Evaluation of treatment

	PRE-EXAMINATION			7 DAYS AFTER			14 DAYS AFTER			MONTH AFTER		
Teardrop height in 3 positions (tempor, middle, nasal)												
L	42	29	36	26	25	35	0,36	0,34	0,66			
R	31	19	34	23	15	23	0,2	0,21	0,36			
BUT - tear film decay, total average												
R	5,71			7,02			6,52					
L	5,1			6,86			5,44					
BUT - tear film decay, average												
R	4,56			6,27			4,31					
L	3,44			2,8			2,72					
Lipid layer - thickne (the higher the better)												
R	50-80			90-140			50-80					
L	50-80			90-140			50-80					
Redness of eyes - bulbal (temporal, nasal), limbal (temporal, nasal)												
R	1,3 2,7		1,1 1,7	2,2 2,0		1,9 1,5	1,7 3,1		1,5 2,5			
L	1,1 1,4		0,9 0,8	1,1 1,3		1,0 0,8	1,4 2,3		1 1,1			
Meimbom. Glands - degree (0. helthy - 4. significant decrease)												
R UPPER	1			1			1			1		
L UPPER	1			1			1			1		
R LOWER	1			1			1			1		
L LOWER	2			2			2			2		



Blepharitis

Case Report 07 (OD) – Keratograph – Evaluation of treatment

SLIT LAMP				
	PRE-EXAMINATION	7 DAYS AFTER	14 DAYS AFTER	MONTH AFTER
CONTROL OF EYELID AND SURROUNDING				
L	eyes calm, visible demodex	eyes calm, demodex	eyes calm, demodex. Therapy- coloidal silver	
R				
CLOTHING THE EYELIDS				
R	yes	yes	yes	
L	yes	yes	yes	
CONTROL OF LASHES - SEARCH, DISCOLORATION, ENTROPION, ECTROPION				
R	no	no	no	
L	no	no	no	
PRESENCE OF DEMODEX - INTERVENTION SIZE				
R	yes - visible	yes - visible	yes	
L	yes - visible	yes - visible	yes	
EXPRESIBILITA OF GLANDS - QUANTITY AND QUALITY				
R	1- milky	yes - clerer than before	1 clear	
L				



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