

Preoperative OCT evaluation of the lens in cases of posterior subcapsular cataract as a factor of the prevention of intraoperative complications in phacoemulsification

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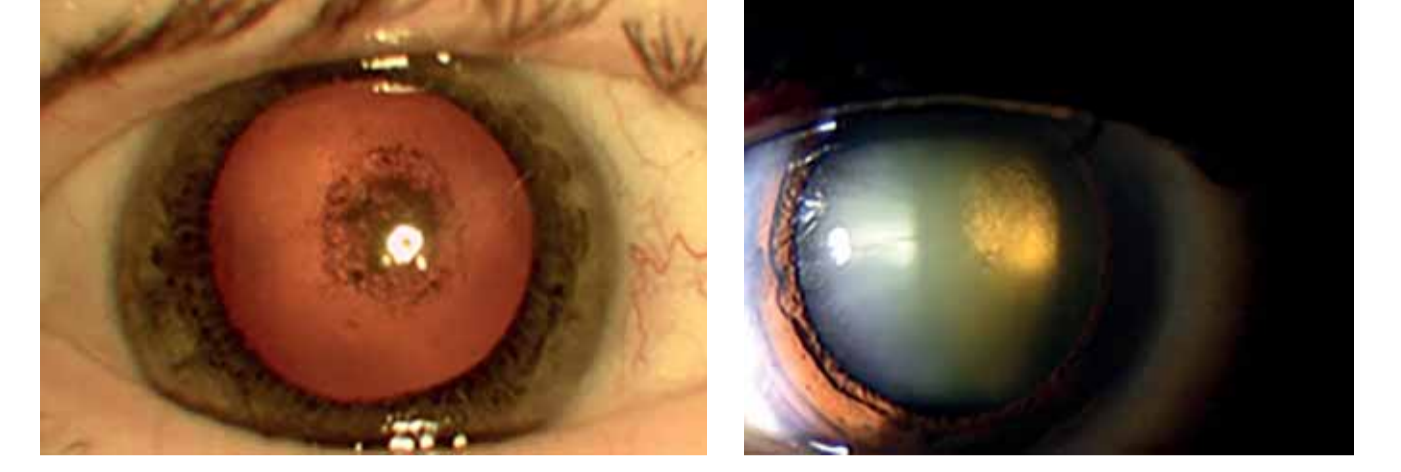
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INTRODUCTION. Posterior subcapsular cataract (PSC) is one of the common cases of cataract that can lead to the increasing rate of intraoperative complications up to 26%. The quantity of complications depends on the integrity and morphological state of posterior capsule, which assessment during biomicroscopy can be difficult due to the intense opacity.

Purpose: to assess the possibility of preoperative evaluation of the lens in cases of PSC in order to prevent intraoperative complications during cataract surgery.

- METHODS.** Prospective study included 512 eyes with PSC which was diagnosed during general eye examination (BCVA, perimetry, tonometry, biomicroscopy, ophthalmoscopy, and ocular biometry).
- Optical coherence tomography (OCT) was conducted in all eyes with PSC with a Optovue RTVue 100 XR Avanti (Optovue Inc, Fremont, CA) using Line and CrossLine scans (high-definition B scans), and 3D Cornea scans.
- Images of OCT were evaluated by two experts independently of each other, and surgical interventions were performed by one experienced surgeon, that excluded possible iatrogenic complications during the operation.

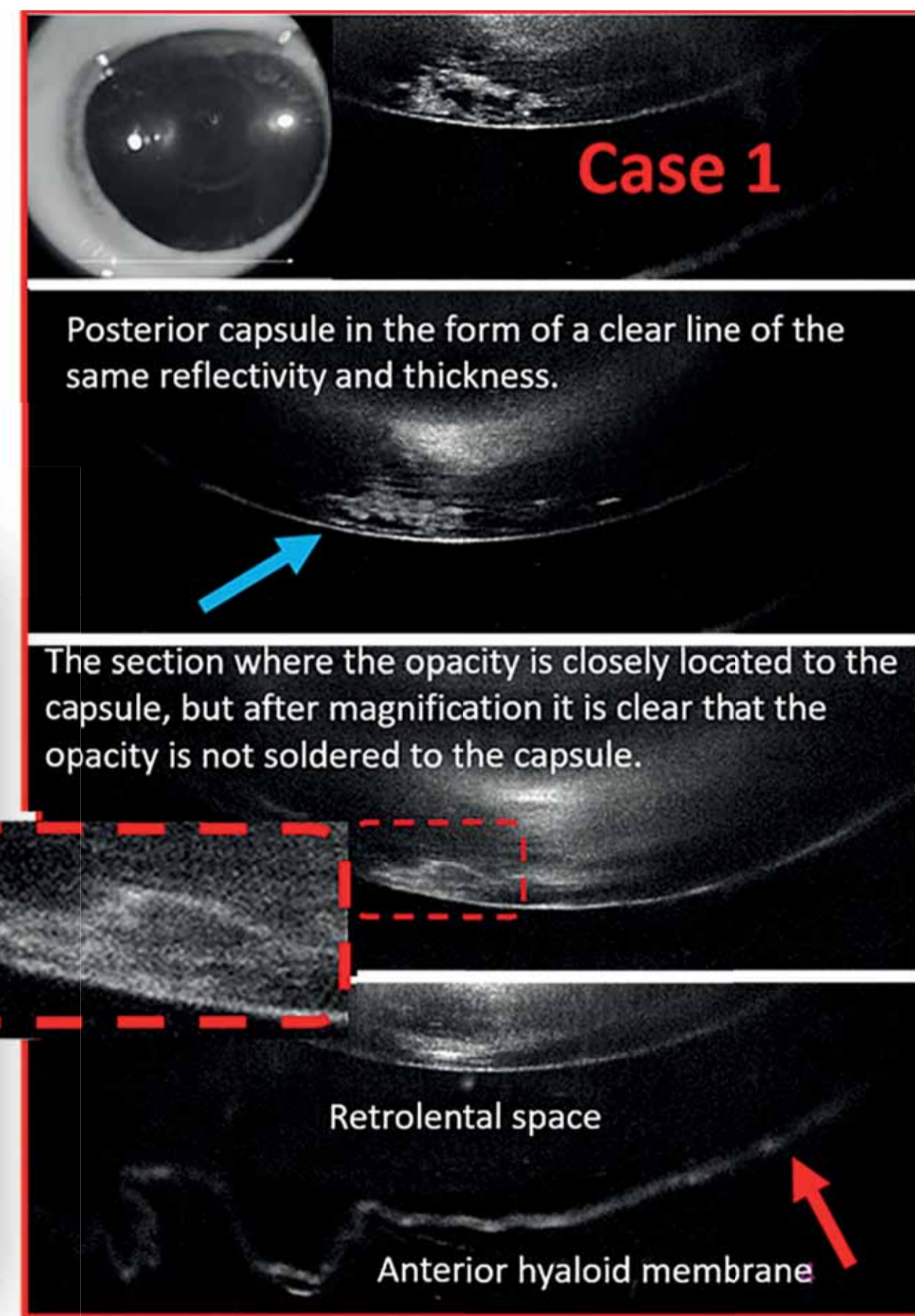


RESULTS. Group 1

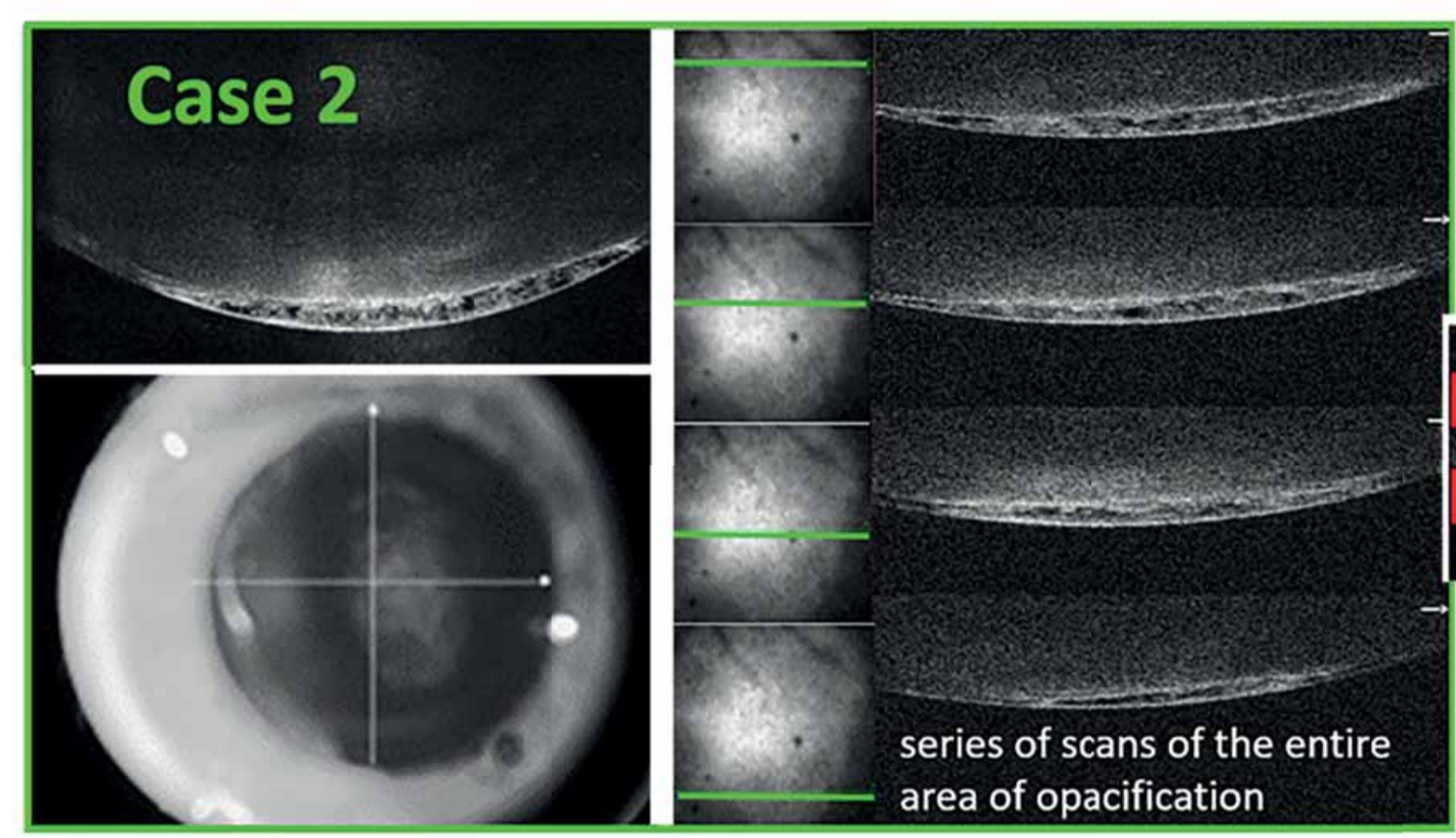
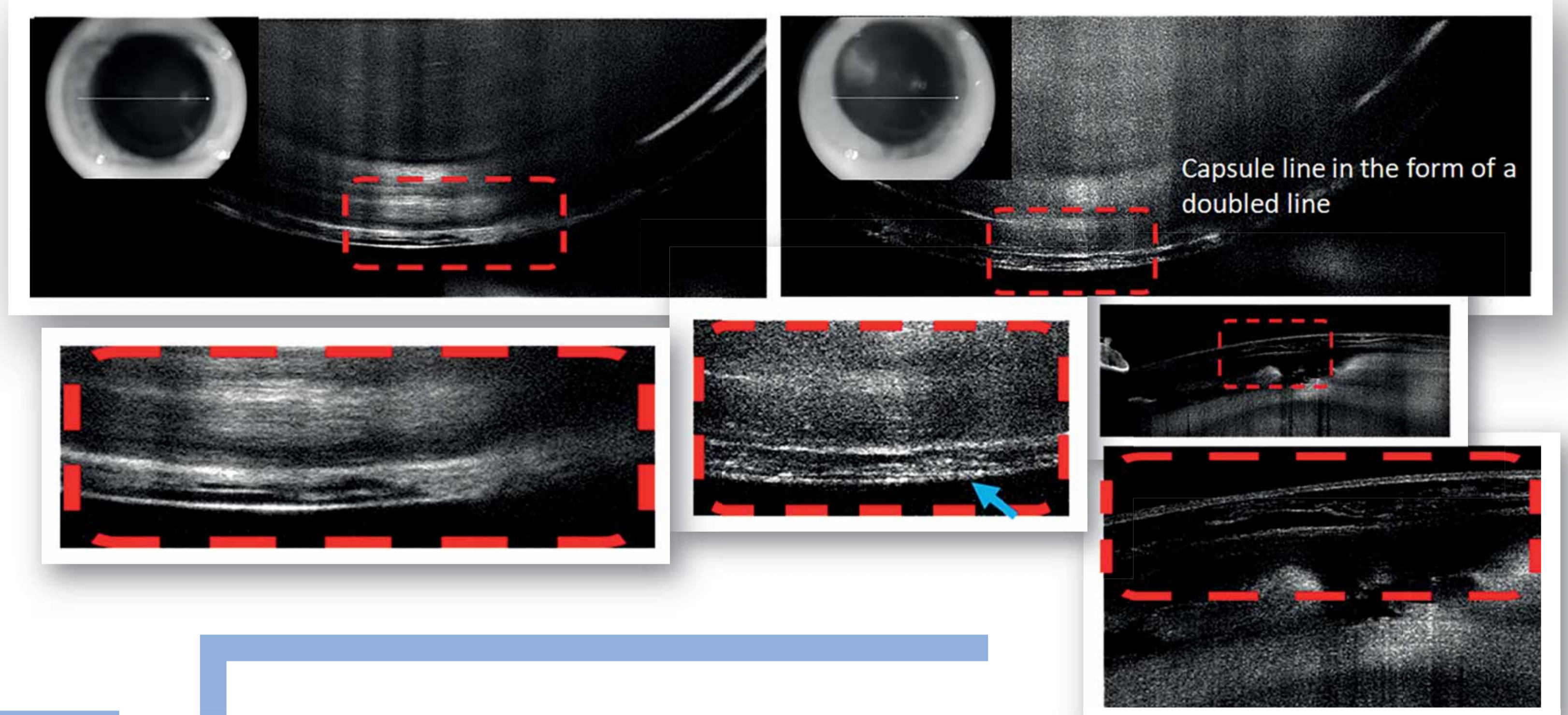


Group 2 – consisted of 185 eyes (36%)

consisted of 312 eyes (61%). Posterior capsule was seen as a clear line of equal thickness and reflectiveness throughout the image. Hydrodissection, hydrodelineation and standart phaco was performed in all cases with type 1 morphological AS-OCT changes. Additional polishing of the posterior capsule was used only in 12 eyes (3.8%) of the group.

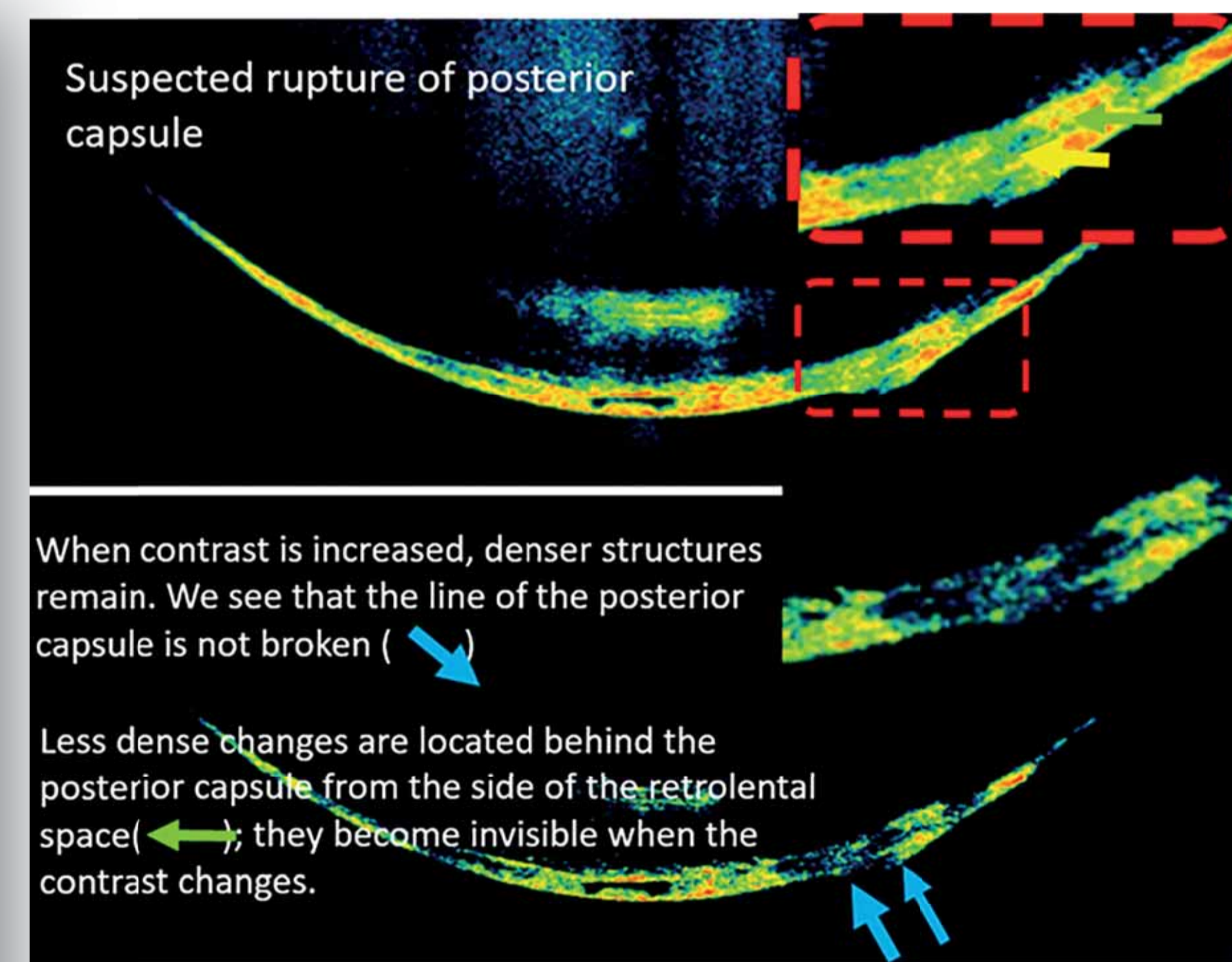
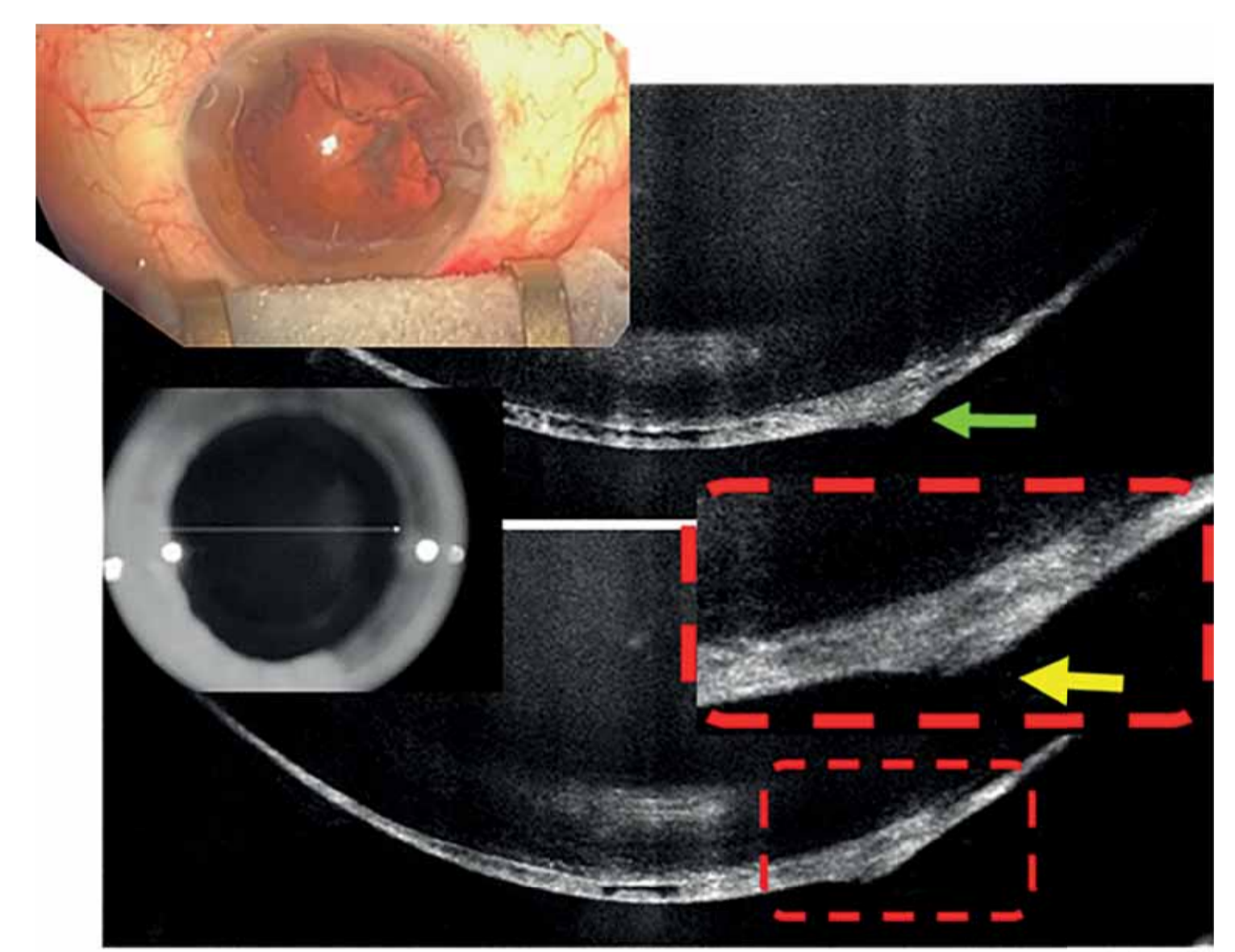


The posterior capsule was not uniform in reflectivity and thickness, sometime appeared as a double line but always clear at the retrolental space. There were dense adherence of hyperreflective foci in posterior cortical layers to the posterior capsule. Peculiarities of cataract surgery- refuse from hydrodissection, hydrodelineation, low irrigation and aspiration flow, posterior capsule polishing in all cases, frequent posterior capsule opacification.



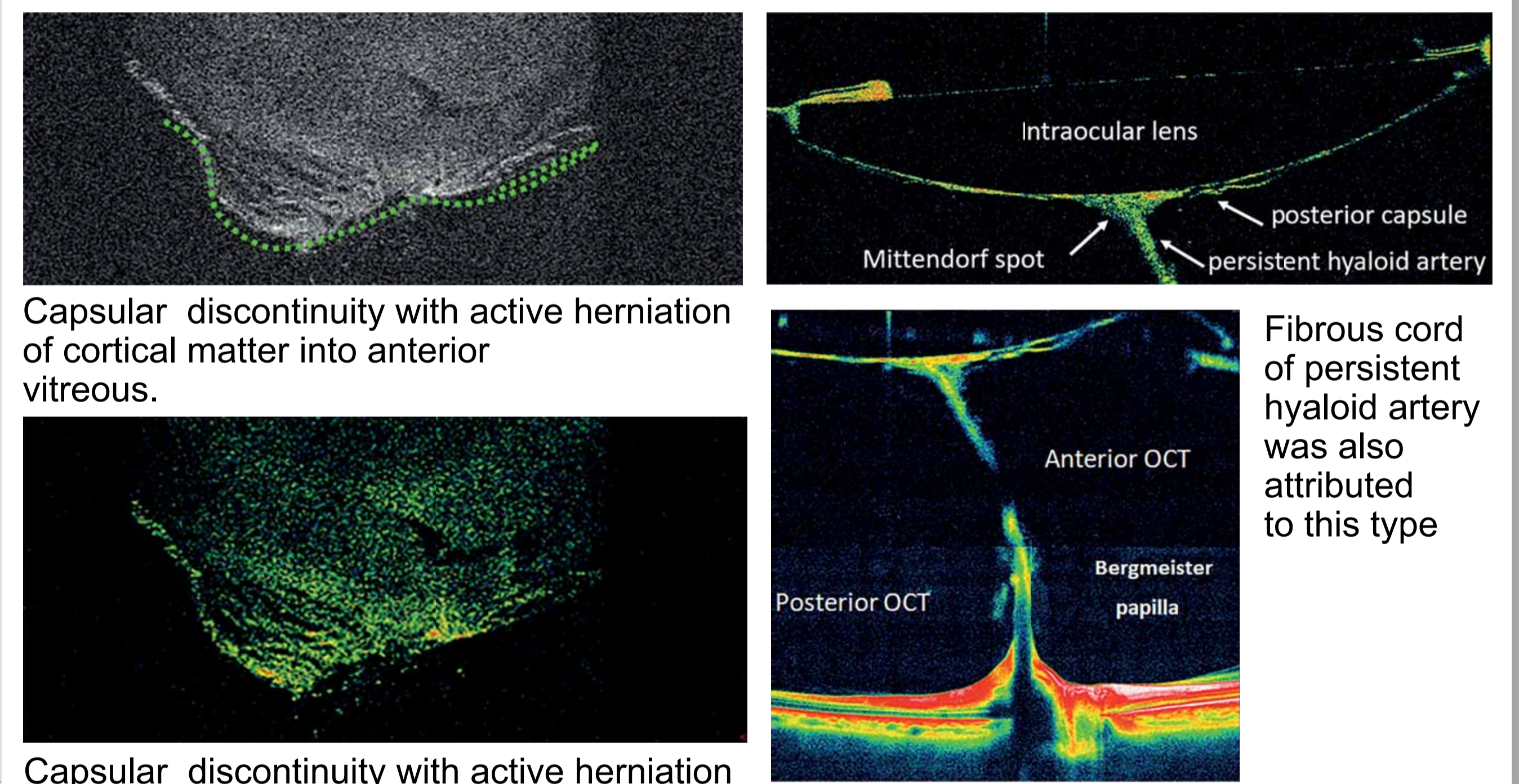
Group 3 (15 eyes, 4%)

Absence of a clear visualization of the posterior capsule, protruding the line of the posterior capsule towards the retrolental space (←), the presence of a possible defect of the capsule (←), violation of its integrity. During surgery capsule rupture occurs in 8 eyes (53%) after nucleus removal, in rest eyes were observed posterior capsule opacification.



In order to improve visualization of the main opacity we changed the contrast that made possible to receive better image of dense structures and evaluate the capsule line in more details.

Examples of the third type posterior capsule cataracts



Clinical features of phaco technique and the presence of intraoperative complications in different types of posterior cataracts

Characteristics	First type N=312	Second type N=185	Third type N=15
Hydrodissection	312/100%	10/5,4%	No
Hydrodelineation	312/100%	185/100%	15/100%
Low parameters	91/29%	161/87%	15/100%
Posterior capsule polish	12/3,8%	185/100%	No
Posterior capsular rupture	No	No	8/53%
Posterior capsular opacification	No	185/100%	6/7%

In 2 type phaco were made almost without hydrodissection, only hydrodelineation was performed in all cases. Posterior capsular opacity was observed in all cases despite the attempts of capsule polish.

In 3 type posterior capsular rupture was evaluated in 8 eyes (53%) after nucleus removal, in other cases we observed posterior capsular opacification.

CONCLUSION:

- Anterior OCT in cases of posterior subcapsular cataract allow to assess structure of posterior lens opacity, changes of posterior capsule and to perform surgical planning in order to avoid intraoperative complications

