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Rhegmatogenous retinal detachment coexisting with a full-thickness macular hole

Przedarciowe odwarstwienie siatkówki z towarzyszącym pełnościennym otworem plamki

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Summary:

To present an uncommon case of coexistent rhegmatogenous retinal detachment and full-thickness macular hole, documented with Spectral Domain Optical Coherence Tomography, which closed after scleral buckling surgery. A 76-year-old woman presented with rhegmatogenous retinal detachment, with a primary peripheral tear. The coexistence of full-thickness macular hole was confirmed with Spectral Domain Optical Coherence Tomography. The best corrected visual acuity was counting fingers. Scleral buckling surgery with gas injection was performed. This single procedure not only resulted in retinal attachment but also enabled closure of the macular hole. After 14 weeks, the retina remained reattached and the Spectral Domain Optical Coherence Tomography scans revealed closure of the macular hole. The final best corrected visual acuity improved to 0.5.

Rhegmatogenous retinal detachment coexisting with a full-thickness macular hole is uncommon. This case demonstrates that in such rare situations it is worth beginning the treatment process with scleral buckling in order to close all peripheral tears. We may hypothesize that gliosis – the result of healing processes after retinal detachment – might have been the primary mechanism responsible for the idiopathic full-thickness macular hole closure in this particular case. Nevertheless, the actual mechanism still remains unknown.

Key words:

retinal detachment, macular hole, scleral buckling.

Streszczenie:

Udokumentowany za pomocą spektralnej optycznej koherentnej tomografii rzadki przypadek współistnienia przedarciowego odwarstwienia siatkówki z pełnościennym otworem w plamce, który uległ zamknięciu w wyniku zabiegu opasania gałki ocznej.

Pacjentkę, 76-letnią, przyjęto na oddział z powodu odwarstwienia siatkówki z towarzyszącym obwodowym przedarciem. Wykonano badanie spektralnej optycznej koherentnej tomografii, które potwierdziło współistnienie pełnościennego otworu plamki. Najlepsza skorygowana ostrość wzroku wynosiła – liczy palce przed okiem. Wykonano zabieg opasania gałki ocznej z podaniem gazu do komory ciała szklistego. Kontrolne badanie przeprowadzone po 14 tygodniach od zabiegu potwierdziło nie tylko przyłożenie siatkówki, lecz także zamknięcie pełnościennego otworu plamki uwidocznione w badaniu spektralnej optycznej koherentnej tomografii. Najlepsza skorygowana ostrość wzroku wyniosła 0,5.

Współistnienie przedarciowego odwarstwienia siatkówki z pełnościennym otworem w plamce należy do rzadkości. W naszej publikacji dowodzimy, że w tych rzadkich przypadkach proces terapeutyczny warto zapoczątkować zamknięciem wszystkich obwodowych przedarć poprzez opasanie gałki ocznej. Możemy też postawić hipotezę, że w tym konkretnym przypadku to glioz – efekt procesu naprawczego uruchomionego po odwarstwieniu siatkówki – odegrała główną rolę w procesie zamknięcia się otworu w plamce.

Słowa kluczowe:

odwarstwienie siatkówki, otwór plamki, opasanie gałki ocznej.

Background

The idiopathic full-thickness macular hole (FTMH) affects mostly women after the 6th decade of life. Oblique, anteroposterior and tangential vitreoretinal tractions are etiopathogenetic factors of this disease (1). FTMH may induce retinal detachment in high myopia, but this has not been reported in emmetropic eyes. It is also very uncommon to observe a coexistence of full-thickness macular hole and rhegmatogenous retinal detachment with a primary peripheral tear. Vitrectomy has been the golden standard for FTMH treatment since its introduction by Kelly and Wendel (2). In retinal detachment with a single

peripheral tear in a phakic eye, scleral buckling seems to be the method of choice (3, 4). There are no treatment standards in coexistence of the two diseases. We decided to begin with scleral buckling surgery to treat retinal detachment in the first course.

Case

A 76-year-old phakic woman presented with a sudden decrease of best corrected visual acuity (BCVA) to counting fingers. Fundus evaluation revealed retinal detachment with a peripheral tear, involving three quadrants of the retina, extending

from 2 o'clock to 11 o'clock positions. The macula was detached. The horseshoe retinal tear could be seen at 10.30 position, posteriorly to the vascular arcades. There also appeared to be an idiopathic full-thickness macular hole (FTMH) on slit-lamp examination (Fig. 1a., b.). Spectral domain optical coherence tomography (SD-OCT) confirmed this finding (Fig. 1c.). The right eye was irrelevant.

A 360 degree encircling circumferential scleral buckling surgery with a 3.5 mm silicone strip was performed. In addition, intravitreal gas injection (sulfur hexafluoride – SF₆) was administered as a tamponade, achieving retinal reattachment (Fig. 2a.). After 14 weeks, the visual acuity in the left eye improved to 0.05, the retina remained reattached and, surprisingly, the SD-OCT examination also revealed closure of the full-thickness macular hole. The closure began in the inner retinal layers and at this time a hyporeflective cystoid space, corresponding to the remaining subretinal fluid was still visible (Fig. 2b.). The macular hole remained closed 13 months after surgery and the fovea contour improved with time (Fig. 2c.). The final visual acuity improved to 0.5.

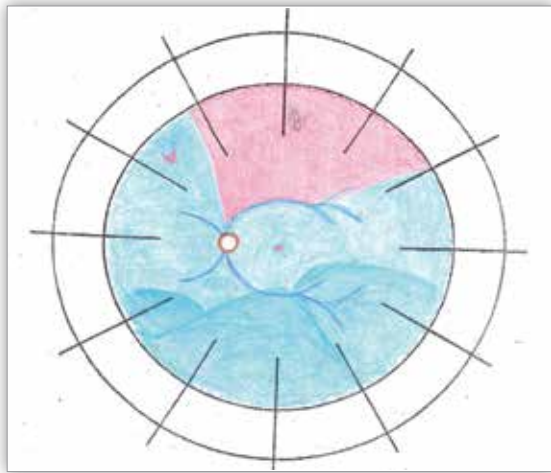


Fig. 1a. Diagram of the fundus of the left eye showing retinal detachment with peripheral tear, involving three quadrants of the retina and the macula. The macular hole is visible.

Ryc. 1a. Rysunek dna oka przedstawiający odwarstwienie siatkówki obejmujące 3 kwadranty oraz plamkę z widocznym obwodowo przedciem. Widoczny jest otwór w plamce.

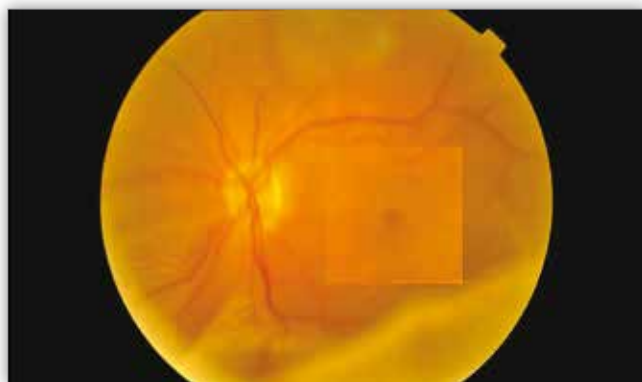


Fig. 1b. Color fundus photography revealing retinal detachment coexisting with a full-thickness macular hole, preoperatively.

Ryc. 1b. Kolorowe zdjęcie dna oka – odwarstwienie siatkówki z towarzyszącym pełnościennym otworem w plamce, przedoperacyjnie.

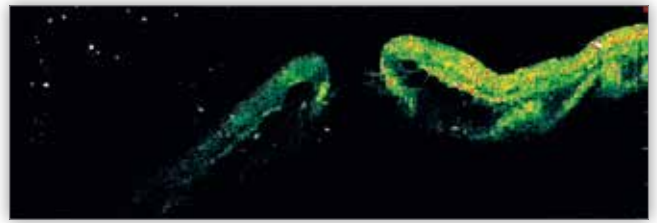


Fig. 1c. SD-OCT scan showing a full-thickness macular hole in the detached retina.

Ryc. 1c. Badanie SD-OCT – pełnościenny otwór plamki, siatkówka odwarstwiona.

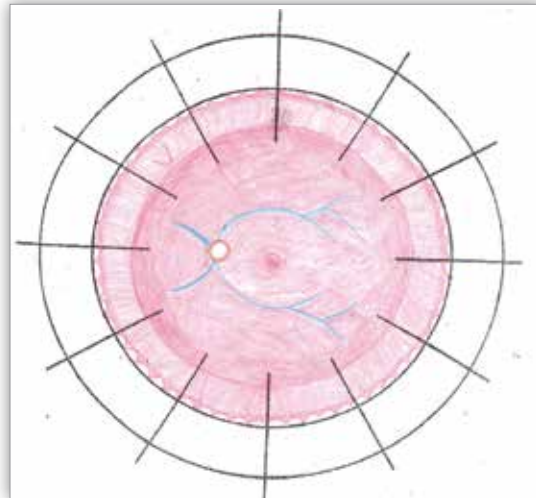


Fig. 2a. Diagram of the fundus of the left eye, postoperatively. Retinal break is closed on the buckle and the retina is reattached.

Ryc. 2a. Rysunek dna oka, pooperacyjnie. Widoczny wał wgłębienia odpowiadający opasaniu z zamkniętym obwodowym przedciem. Siatkówka jest przyłożona.

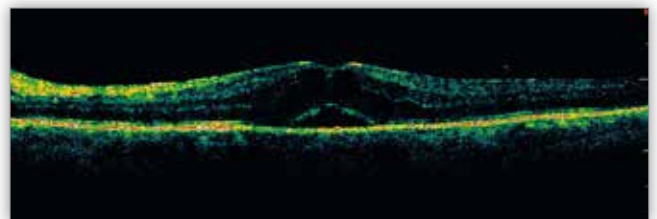


Fig. 2b. SD-OCT scan at fourteen weeks after scleral buckling surgery presenting the closure of a full-thickness macular hole from the outer retinal layers. Subretinal translucency and intraretinal cystoid spaces are visible.

Ryc. 2b. Czternaście tygodni po zabiegu opasania gałki ocznej. Badanie SD-OCT – zamykający się otwór plamki, proces przebiega od zewnętrznych warstw siatkówki. Widoczne torbielowate przestrzenie śródsiatkówek i oddzielenie siatkówki sensorycznej od nabłonka barwnikowego siatkówki w okolicy doteczka.

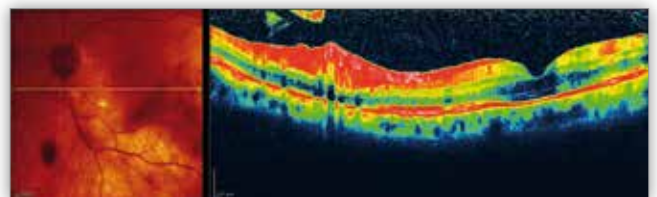


Fig. 2c. SD-OCT scan at thirteen months postoperatively showing an U-type closure of a full-thickness macular hole. The retina is reattached.

Ryc. 2c. Trzynaście miesięcy po zabiegu. W badaniu SD-OCT widoczne U-kształtne zamknięcie otworu plamki. Siatkówka pozostaje przyłożona.

Discussion

Our report demonstrates a rare case of rhegmatogenous retinal detachment with a primary peripheral tear coexisting with FTMH. To the best of our knowledge, there are no other SD-OCT-documented reports on closure of a macular hole associated with rhegmatogenous retinal detachment.

Vitrectomy enables FMTH closure due to relieving anteroposterior and oblique traction during vitreous removal and additionally due to relieving tangential traction when internal limiting membrane is peeled (5). Histological studies suggest that another mechanism responsible for FMTH closure is the replacement of a macular hole with glial tissue, resulting in a bridging effect of retinal tissue across the macular hole (6). Both astrocytes and Müller cells are suspected to be mobilized and involved in glial scar formation (7). Peeling of the internal limiting membrane may induce gliosis, which is another factor enabling closure (8).

We did not perform any vitrectomy in this patient; however, rhegmatogenous retinal detachment itself also induces gliosis. Tissue injury leading to retinal detachment induces a wound healing response, which is divided into three phases – inflammation, proliferation and scar formation (9). Thus, when the retina reattached, gliosis induced by retinal detachment might have been the primary mechanism responsible for FTMH closure. On the other hand, previous studies indicate that FTMH can develop after successful scleral buckle surgery in rhegmatogenous retinal detachment. Its etiopathogenesis is not known, although retinal ischemia due to separation of the choroidal vascular supply and vitreoretinal tractions are considered to play the major role. FTMH was most commonly found after macula-off detachment and effectively treated using conventional pars plana vitrectomy (10–13).

FTMH coexisting with rhegmatogenous retinal detachment in emmetropia is uncommon. In such rare cases, a surgeon needs to decide which treatment approach should come first – primary vitrectomy or scleral buckling. According to recent large studies in retinal detachment with a single peripheral tear in a phakic eye, scleral buckling seems to be the method of choice (3, 4). Our report demonstrates that also in this specific case of retinal detachment coexistent with FTMH, scleral buckling may enable spontaneous closure of FTMH without additional surgery.

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