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Spontaneous unilateral exudative retinal detachment as the first manifestation of lung cancer

Samoistne jednostronne wysiękowe odwarstwienie siatkówki jako pierwszy objaw raka płuca

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Abstract:

The authors presented a case of a 50-year-old woman with vision deterioration in the right eye lasting for 3 weeks, without concomitant organ symptoms. Eye fundus examination showed two large bullae of the detached retina, without a visible tear. Fluorescein angiography revealed fluorescein leakage around retinal vessels and dye release in detachment borders in the venous phase. Laboratory tests ruled out parasite, inflammatory and infectious diseases. Chest X-ray with central nervous system and abdominal cavity imaging (Computed Tomography, Magnetic Resonance Imaging) showed disseminated lung tumour with metastases to the brain. Histological evaluation confirmed disseminated lung adenocarcinoma T2N3M1. Spontaneous unilateral exudative retinal detachment, without any chorioretinal metastases may be the first ocular sign of disseminated malignancy.

Key words:

exudative retinal detachment, lung cancer, adenocarcinoma, eye, retina.

Abstrakt:

Autorzy przedstawili przypadek 50-letniej kobiety, u której doszło do pogorszenia widzenia w oku prawym, trwającego od 3 tygodni, bez współistnienia objawów ze strony innych narządów. W badaniu dna oka uwidoczono dwa rozległe pęcherze odwarstwionej siatkówki, bez widocznego przedarcia. W badaniu angiografii fluoresceinowej uwidoczono przeciekanie fluoresceiny w fazie tętnicznej oraz uwalnianie barwnika w granicach odwarstwienia w fazie żylniej. W badaniach laboratoryjnych wykluczono choroby pasożytnicze, zapalne oraz o etiologii zakaźnej. Diagnostyka radiologiczna płuc, ośrodkowego układu nerwowego i jamy brzusznej (tomografia komputerowa i rezonans magnetyczny) wykazała obecność rozlanego procesu nowotworowego – przerzutów z płuc do mózgu. W badaniu histopatologicznym postawiono rozpoznanie gruczolakoraka płuc w stadium rozsiewu T2N3M1. Samoistne jednostronne wysiękowe odwarstwienie siatkówki bez ognisk przerzutowych do naczyniówki może być pierwszym okulistycznym objawem rozlanego procesu nowotworowego.

Słowa kluczowe: wysiękowe odwarstwienie siatkówki, rak płuca, gruczolakorak, oko, siatkówka.

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Introduction

The authors presented a rare case of a 50-year-old woman with monocular exudative retinal detachment which was the first sign of disseminated lung adenocarcinoma. To date, only two such cases have been reported (1–2).

Case History

A 50-year-old woman presented to hospital department of ophthalmology due to worsening of vision in her right eye (RE) lasting for 3 weeks. Her only other complaint was dry cough lasting for 3 weeks. The best corrected visual acuity (BCVA) for distance in RE was 1/50 (Snellen chart), intraocular pressure (IOP) was 12.2 mmHg. Indirect ophthalmoscopy of RE revealed retinal detachment sized 8 disc diameters (dd) presenting as two large bullae with opaque fluid. The bullae were located between temporal and superior vascular arches. No retinal holes, degeneration, tear or metastases were obser-

ved (Fig. 1–2). A routine ophthalmic examination of the left eye did not reveal any abnormality.

B-mode ultrasound and Color Doppler Imaging (CDI) confirmed retinal detachment in RE with uveal thickening up to 0.21 cm (Fig. 3). Optical coherence tomography (OCT) of the detached retina (Heidelberg HRA, OCT Spectralis and Zeiss Cirrus HD-OCT 4000), showed elevation and detachment of the neurosensory retina from retinal pigment epithelium (RPE) (Fig. 4–6). Pigment leakage in the early arterial phase of fluorescein angiography (FA) within the temporal arches of retinal vessels and inside the detachment was noted. Additionally, arterial and venous phase of FA confirmed a massive pigment release within the borders of the detachment (Fig. 7–12).

Laboratory tests ruled out active cytomegalovirus infection, toxoplasmosis, Lyme disease, syphilis, tuberculosis, lambliosis, cysticercosis and other parasitic infections. They also confirmed abnormal levels of erythrocyte sedimentation rate (ESR 69 mm),

C-reactive protein (CRP 16.8 mg/L), D-dimers (1238 ug/L), fibrinogen (7.5 g/L), lactate dehydrogenase (311 U/L), as well as tumour markers: cancer antigen 125 (CA 97.53 U/ml) and carcinoembryonic antigen (CEA 6.4 U/ml).

Abdominal ultrasound revealed three hyperechogenic lesions in the liver (10 and 8 mm in the right lobe and 8 mm in the left

lobe) (Fig. 13), which were verified in the CT to be hepatic angiomas. Chest X-ray revealed uniform shading of the superior lobe of the left lung with air bronchogram suggesting lobular pneumonia (Fig. 14). Furthermore, 1.5 mm thick atelectasis of the entire superior lobe and the lower part of the inferior lobe of the left lung was found. Enlarged lymph nodes were seen on CT within



Fig. 1. Detached retinal layers filled with opaque fluid within the posterior pole of the eye.

Ryc. 1. Warstwy odwarstwionej siatkówki z mętnym płynem w tylnym biegunie gałki ocznej.



Fig. 2. Retinal detachment in the temporal quadrant.

Ryc. 2. Odwarstwienie siatkówki w kwadrancie skroniowym.



Fig. 3. B-scan showing retinal detachment.

Ryc. 3. Badanie ultrasonograficzne ukazujące odwarstwienie siatkówki.

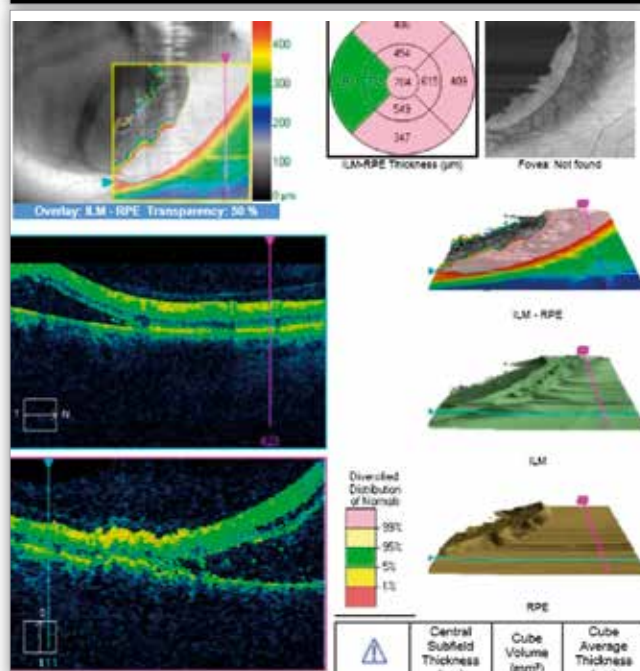
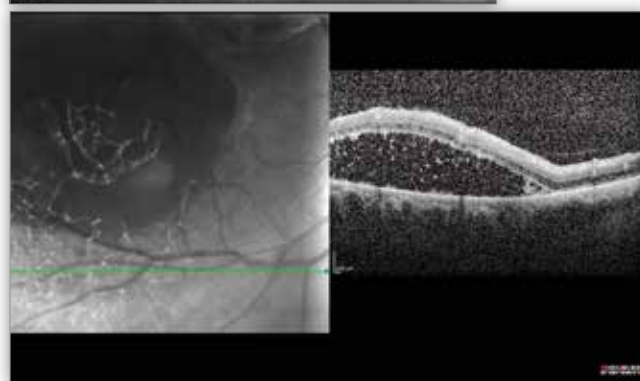
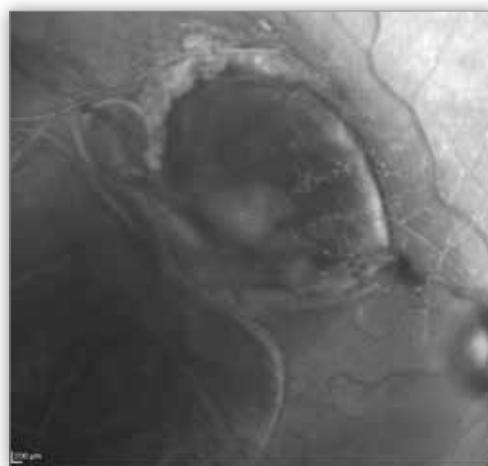


Fig. 4–6. OCT of the posterior pole – detachment of the neurosensory retina from retinal pigment epithelium.

Ryc. 4.–6. OCT tylnego bieguna – odwarstwienie warstwy neurosenso-rycznej od nabłonka barwnikowego.

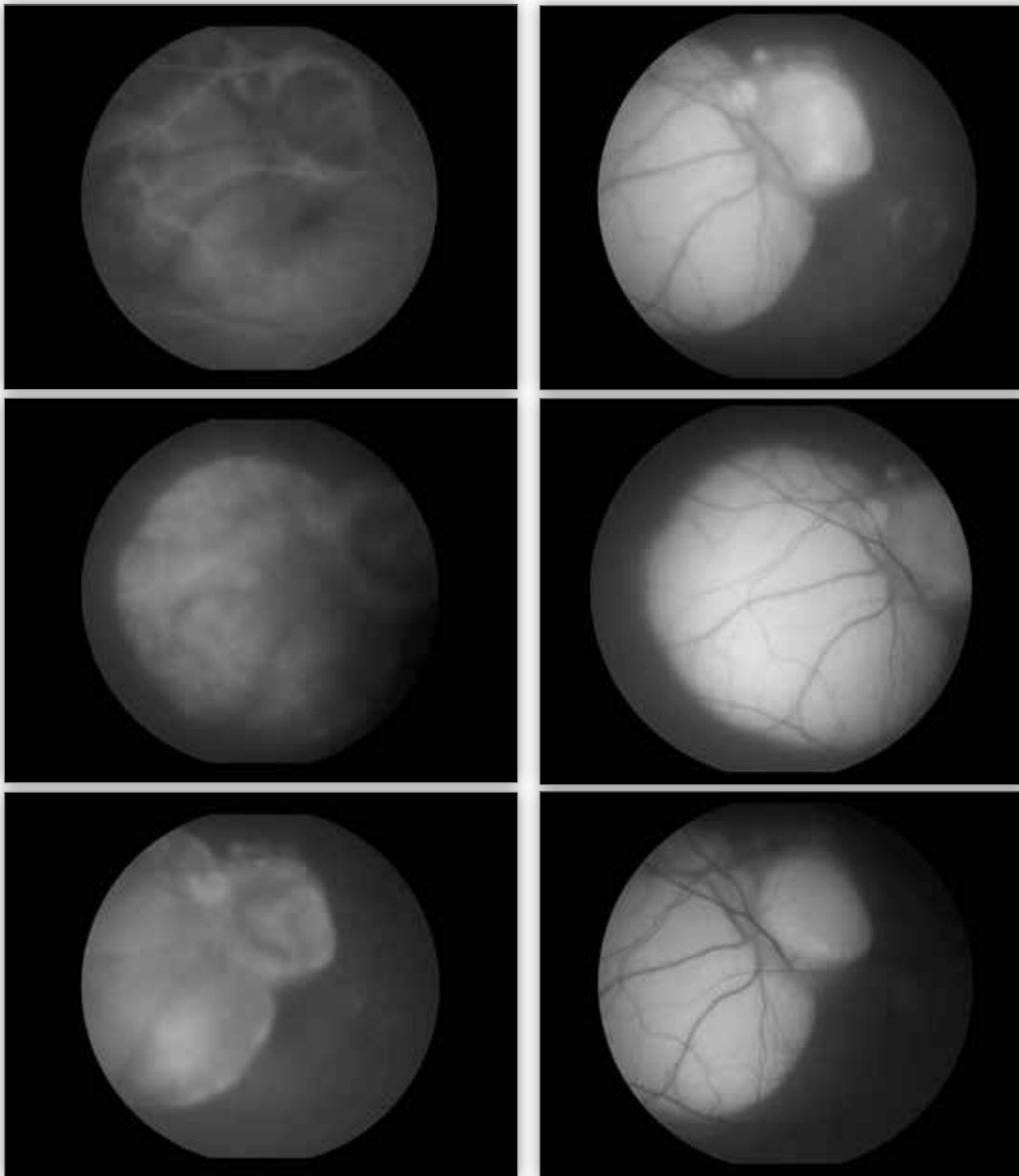


Fig. 7–12. Fluorescein angiography – dye leakage in the early arterial phase within the superior temporal vascular arcade and within the detached area; extensive dye leakage within the borders of detachment in the late arterial and venous phase.

Ryc. 7.–12. Wynik badania angiografii fluoresceinowej – przeciekanie barwnika we wczesnej fazie tętniczej z naczyń łuku skroniowego górnego oraz w obrębie odwarstwienia, a także masywne uwalnianie barwnika w granicach odwarstwienia w fazach późnej tętniczej i żylniej.



Fig. 13. Ultrasonography of the liver – hyperechogenic lesions in both liver lobes (hepatic angiomas).

Ryc. 13. Badanie ultrasonograficzne wątroby – hiperechogeniczne zmiany w płatach wątroby (naczyniaki wątroby).



Fig. 14. Chest X-ray – uniform shading of the superior lobe of the left lung with air bronchogram.

Ryc. 14. RTG klatki piersiowej – jednolite zaciemnienie górnego płata płuca lewego z powietrznym bronchogramem.

the pericarinal area and the right pulmonary cavity. Additionally, head CT followed by MRI showed numerous focal cerebellar lesions, surrounded by an edematous zone, which showed significant contrast enhancement. The above findings indicated a disseminated malignancy. Biopsy of the supraclavicular lymph node and the left lung was performed and, based on histologic evaluation and imaging, the ultimate diagnosis of extensive lung adenocarcinoma (T2N3M1) of the left lung was made. The patient was referred for palliative CNS and left lung radiotherapy and was qualified for 4 cycles of paclitaxel-carboplatin chemotherapy (ChTx). Following the completion of the third ChTx cycle the patient's status deteriorated which resulted in her death 4 months after the onset of the first ocular symptoms.

Discussion

Exudative retinal detachment (ERD), as defined by Ghazi et. al., is a detachment of the neurosensory retina from retinal pigment epithelium located superiorly, caused by leakage from retinal and choroidal vessels and accumulation of subretinal fluid with no tears or retinal traction (3). To date, only single reports are available in the literature suggesting that ERD may be the first symptom of acute leukemia and lung cancer in adults (1, 2, 4). So far, the cases have only been reported, where ERD was concomitant with ocular metastases of lung cancer in men and breast cancer in women or primary intraocular tumours, e.g. melanoma or retinoblastoma (5, 6). According to the literature, 7.1–9% of patients with lung cancer develop choroidal metastases (7, 8). In 2010, Burgess et. al. postulated that ERD is a paraneoplastic syndrome which develops secondary to uveitis (2). At present, it is believed that spontaneous ERD present in patients with malignancies yet not metastasis-related, can be explained by retinal vessel occlusion by tumour cells, which leads to retinal ischemia, increased permeability of vascular endothelium and subretinal fluid leakage. Rheological blood changes, including hypercoagulation (elevated levels of D-dimers and fibrinogen, which were present in the patient in question) and hypoalbuminemia, are frequently seen in patients with disseminated malignancies and may result in thrombus formation within small retinal vessels (4). This phenomenon is the likely cause of ERD in the discussed case.

The treatment of ERD depends on the underlying disease. In primary intraocular tumors or other malignancies, the treatment depends on the location and size of lesions, the number of satellite lesions and the extent of a generalized neoplasm. The treatment of multiple, bilateral retinal metastases utilizes chemotherapy, immunotherapy, hormonal therapy and radiotherapy. Local treatment options involve brachytherapy, proton beam therapy and targeted delivery of chemotherapy to the tumour feeder vessel (9). Good response of ocular metastases of lung adenocarcinoma to radiotherapy has been reported (10). Other methods include surgical treatment, photodynamic therapy (PDT) and enucleation (11). At present, anti-VEGF agents

e.g. bevacizumab and ranibizumab, which inhibit pathological blood vessel formation and reduce their permeability, are being studied for the treatment of ERD. The patients with paraneoplastic syndrome are treated with systemic steroid therapy and immunosuppression (9).

ERD may be the first manifestation of a disseminated lung malignancy, without any chorioretinal metastases. A thorough medical history and an in-depth assessment of general health including diagnostic imaging of other organ systems along with detailed laboratory tests may be useful in differential diagnosing of non-ophthalmic causes of exudative retinal detachment.

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