A RARE TYPE OF USHER'S SYNDROME

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SUMMARY – A case is presented of a very rare type of Usher's syndrome detected in a 30-year-old woman in her 28th week of pregnancy. She reported left eye visual impairment with a one-month history. She underwent standard ophthalmologic examination with additional procedures scheduled after childbirth, including fluorescein angiography, visual field (Goldman and Octopus) and electroretinography. Fundus examination revealed pallor of the optic disk, diffuse retinal blood vessel narrowing, no retinal pigmentation, left macular edema, vitreous liquefaction, and posterior vitreous detachment. Goldman perimetry showed narrowing of all isopters to 10°, and Octopus perimetry showed peripheral decrease of retinal sensitivity. Electroretinography confirmed the diagnosis of retinitis pigmentosa sine pigmento. Upon collecting case history records, hearing disorders originating from childhood were discovered. To our knowledge, this type of retinitis in Usher's syndrome has been reported only once in the available literature.

Key words: *Usher syndromes; Retinitis pigmentosa; Deafness; Blindness; Case report*

Introduction

Usher's syndrome is an autosomal recessively inherited disease characterized by retinitis pigmentosa, sensorineural hearing loss, and in some cases vestibular problems. It is the most common of syndromes associated with retinitis pigmentosa and it is known to accompany 18% of cases[1-6]. Although the syndrome was first described by Albrecht von Graefe in 1858, it was named after Charles Usher, who established the heritability of this condition[7]. Usher's syndrome is an uncommon disease, with a prevalence of 2-6 cases *per* 100 000. It accounts for about 6% of congenitally deaf population and 50% of both deaf and blind individuals[2,5,8].

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Usher's syndrome can be clinically divided into three groups on the basis of the severity and progression of hearing loss and the age at onset of retinitis pigmentosa[9]. Type I is most frequent and is characterized by profound congenital sensorineural deafness, vestibular symptoms, and childhood-onset retinopathy[1,4]. Type II is the most common subtype and is characterized by congenital non-progressive deafness, absence of vestibular symptoms, and milder, later onset retinopathy[2,3]. Type III Usher's syndrome is the least common except for the populations of Finland and among Ashkenazi Jews; it manifests with progressive deafness usually activating in the second decade of life, adult-onset retinopathy, and hypermetropia[10,11].

Usher's syndrome demonstrates significant genetic heterogeneity with gene localization studies showing that each type of this syndrome is related to several different genes on distinct chromosomes. It is an inherited condition and is not caused by only one

gene. Although some of the genes that cause Usher's syndrome have been identified, the diagnosis is still essentially based on ocular and clinical testing[1]. The most important clinical distinctions are based on the difference in hearing and balance impairment. To date, genetic testing is still not a widespread routine procedure for the detection of this syndrome[12].

Clinical tests for Usher's syndrome include retinal examination, visual function tests (visual field and electroretinogram), hearing and balance tests[13,14]. Further, Usher's patients present progressive photoreceptor degeneration in the retina, i.e. retinitis pigmentosa, which leads to the loss of peripheral vision[15]. The classic ophthalmoscopic triad is waxy disk pallor, arteriolar narrowing and retinal bone-spicule pigmentation. Night blindness or nyctalopia is usually the first ocular symptom. Central visual function can either remain unaffected for a long period, or conversely, have earlier onset if cystoid macular edema, diffuse retinal vascular leakage, or retinal pigment defect in the macula occurs[14].

Differential diagnosis of Usher's syndrome includes Bardet-Biedl syndrome, rubella retinopathy, traumatic retinopathy, Refsum's disease, adult Refsum's disease, Cockayne's syndrome, Friedreich's ataxia, and Kearns-Sayre syndrome[6].

To date, there is still no known treatment for Usher's syndrome available. The hearing loss problem can be solved by the use of hearing aids and cochlear implantation, but the retinal problems remain unsolved[16]. Thus, the primary strategy remains early identification of affected patients, so that timely education programs can be administered.

Case Report

A 30-year-old woman in her 28th week of pregnancy was examined because of the left eye visual impairment. She reported a one-month history of unilateral sudden reduction of the central vision that she related to her pregnancy. However, deterioration of her condition prompted her to consult an ophthalmologist for additional testing.

The patient's medical history revealed that she had worn glasses from childhood and reported no other illnesses. Her parents were normal sighted and not closely blood related. All close relatives including her younger sister reported normal vision.

Standard ophthalmologic examination showed reduced visual acuity on the left eye measuring 0.6 (cc -2.0 dsph), whilst the right eye visual acuity was normal, 1.0 (cc -2.0 dsph). Color vision, stereopsis, ocular motility and biomicroscopy were normal. Fundus examination revealed pallor of the optic disk, diffuse retinal blood narrowing, no retinal pigmentation, vitreous liquefaction, posterior vitreous detachment, and left eye macular edema (Fig. 1).

Additional tests including fluorescein angiography, visual field testing and electroretinography were performed after childbirth. Fluorescein angiography

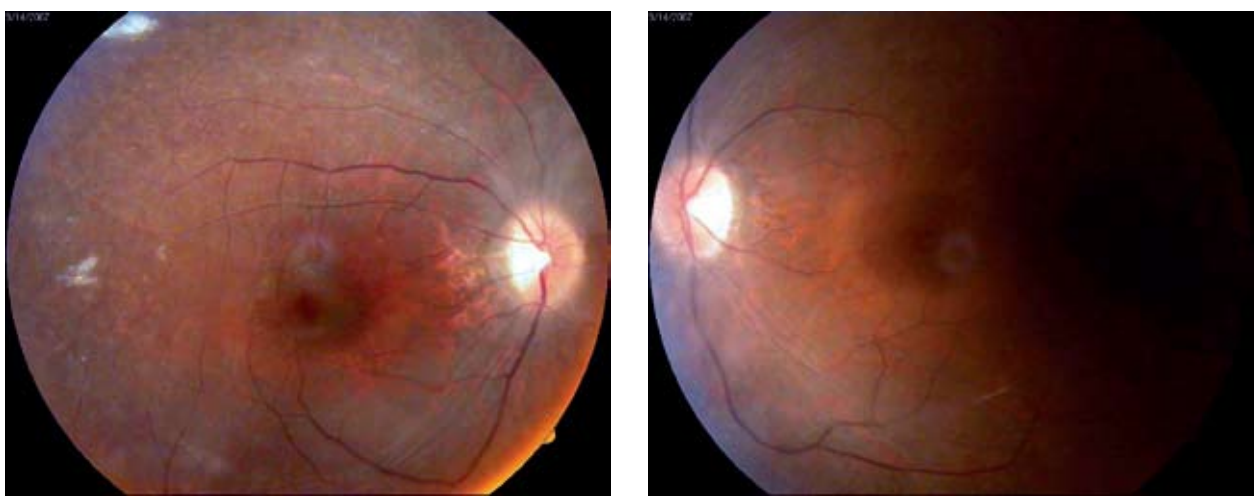

Fig. 1. Funduscopy revealed waxy pallor, diffuse retinal blood vessel narrowing, left macular edema, and no retinal pigmentation (a = right eye; b = left eye).

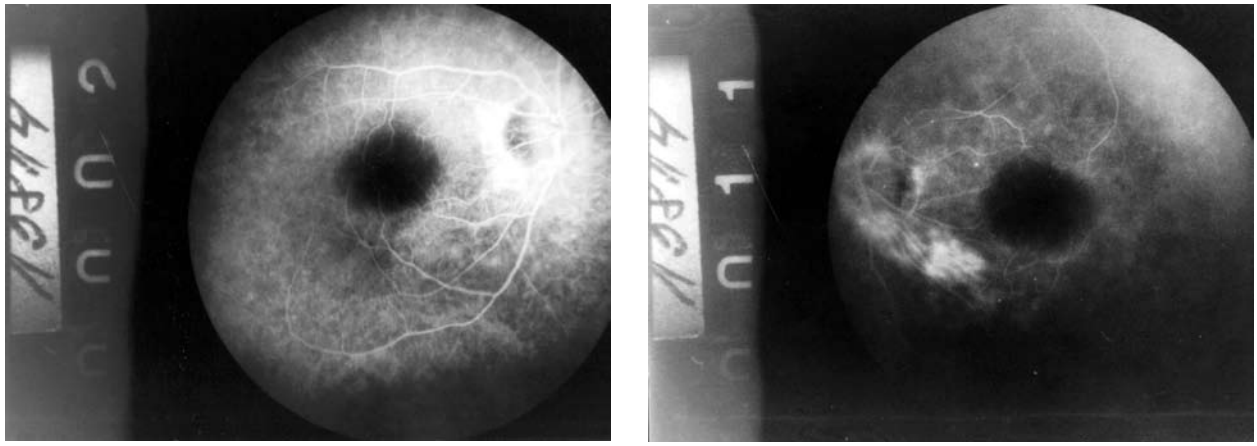

Fig. 2. Fluorescein angiography showed diffuse retinal blood vessel narrowing and fluorescein leakage in the left lower macular quadrant (a = right eye; b = left eye).

confirmed the presence of macular edema and diffused retinal blood narrowing (Fig. 2). Goldmann kinetic perimetry showed narrowing of all isopters to 10 degrees (Fig. 3). Octopus static perimetry demonstrated loss of retinal sensitivity in the mid- and far fundus periphery (Fig. 4). The suspected diagnosis of pigmentary retinopathy without pigment, based on ophthalmoscopic examination and visual field was confirmed by electroretinography (Fig. 5).

Collecting the case history records, hearing disorders originating from childhood were discovered (Fig. 6), making us suspicious of the existence of Usher's syndrome. Our patient had worn glasses and a hearing device from her childhood and had regularly undergone medical ophthalmology and otorhinolaryngology examinations. Since her visual acuity was normal, and no characteristic pigmentation was found on the fundus, and her night blindness was associated with myopia, retinitis pigmentosa sine pigmento as part of Usher's syndrome had not been previously suspected.

In our case, we believed that the diagnosis of Usher's syndrome could be made with certainty on the basis of medical examination, functional tests and electrodiagnostics, and therefore we did not request gene analysis. According to medical symptomatology of a non-progressive hearing loss and absence of vestibular symptomatology, we came to a conclusion that our patient was a case of Usher's syndrome type II.

Discussion

To our knowledge, only one scientific report has been published addressing this type of retinitis in

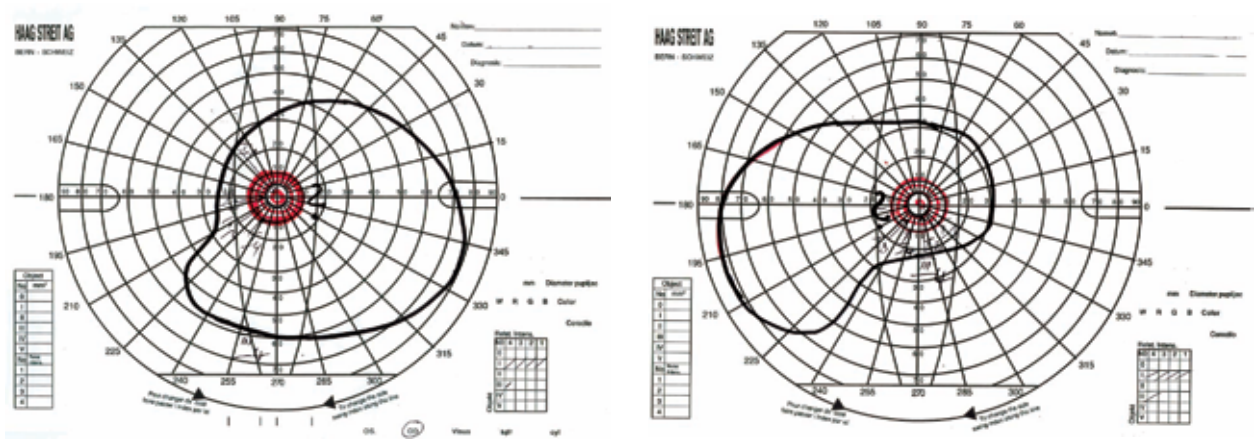

Fig. 3. Visual field examination revealed bilateral tubular vision (a = right eye; b = left eye).

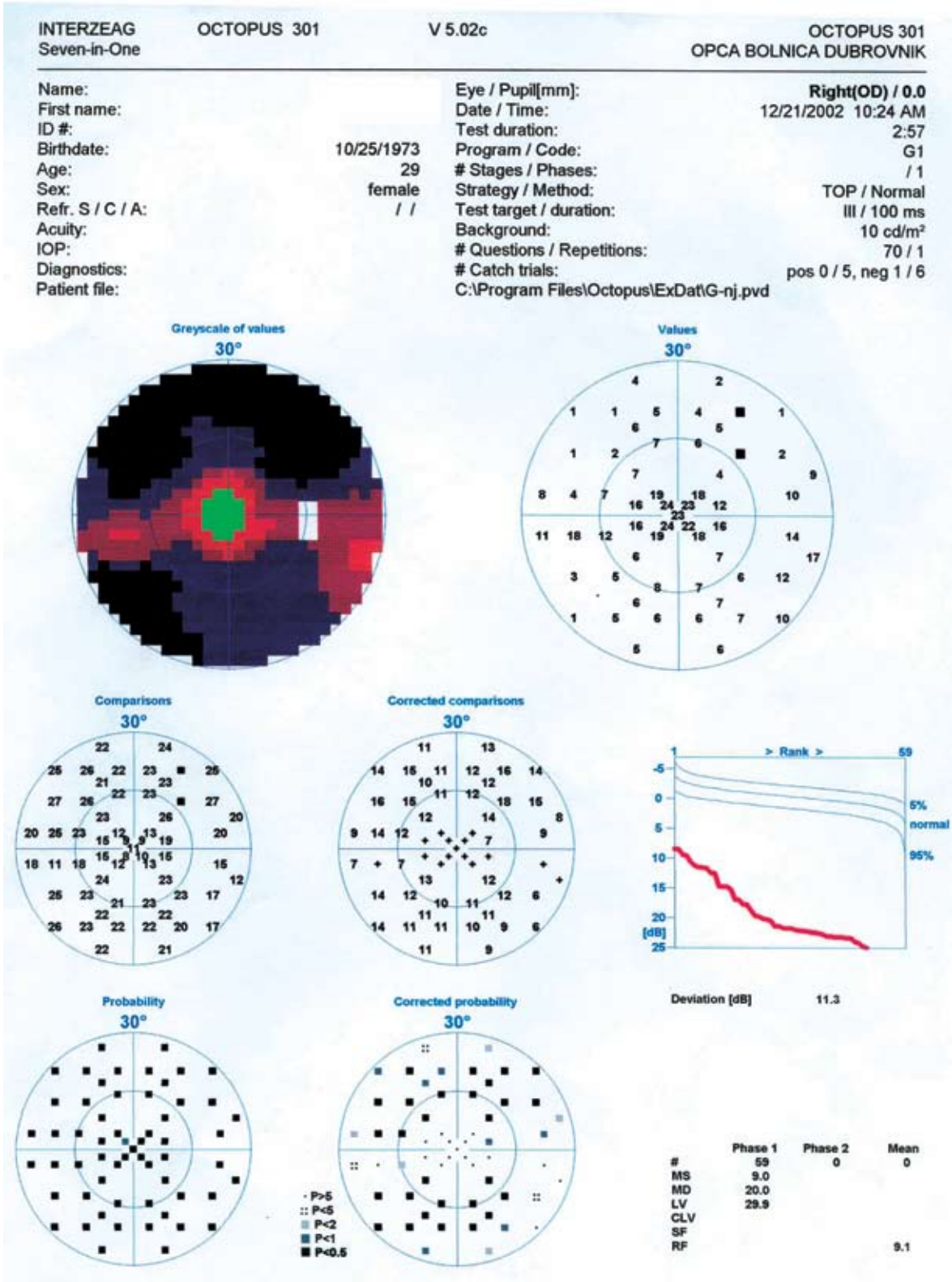

Fig. 4. Octopus static perimetry showed great loss of retinal sensitivity (a = right eye).

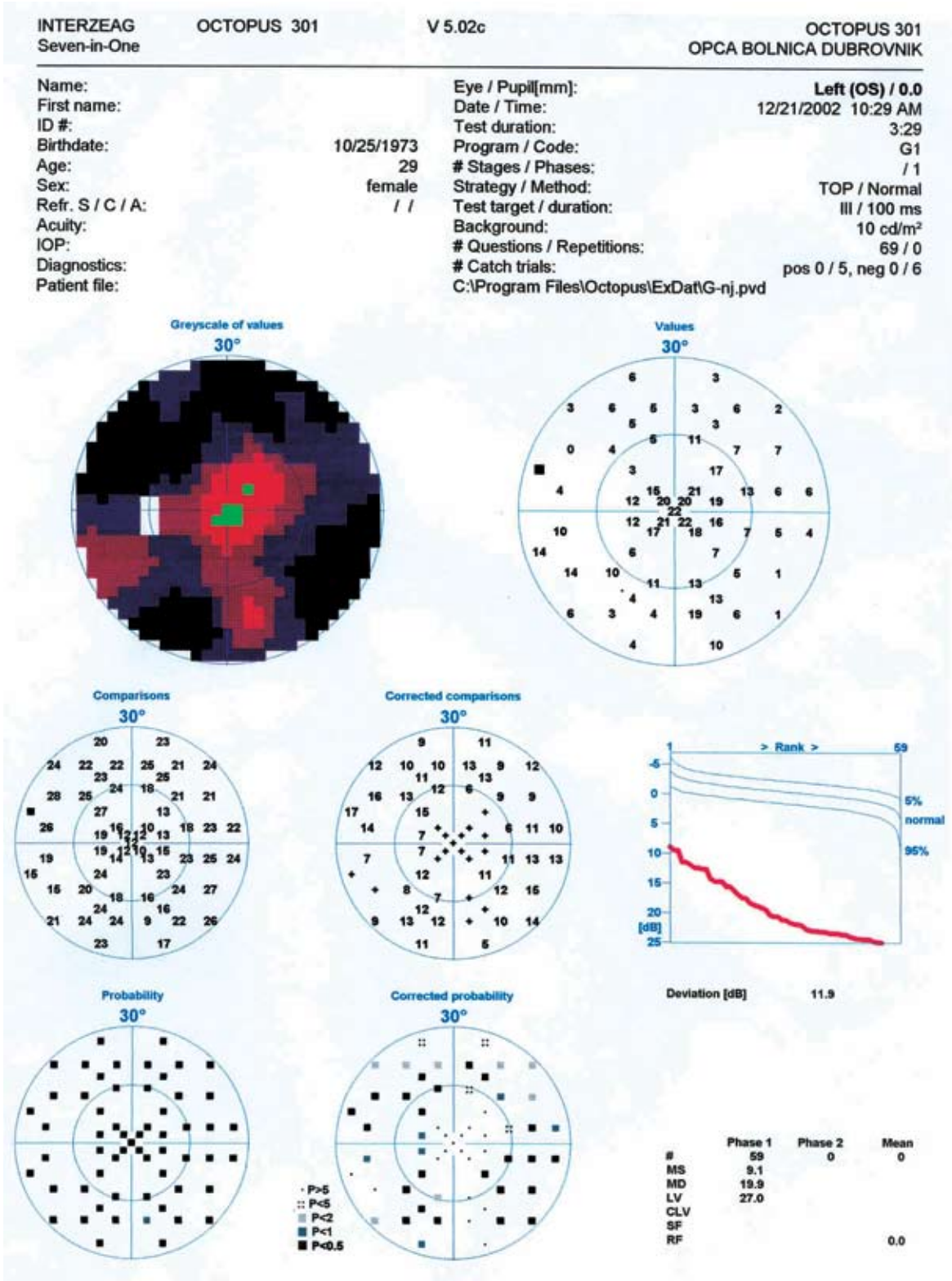

Fig. 4. Octopus static perimetry showed great loss of retinal sensitivity (b = left eye).

TOMEY – PRIMUS

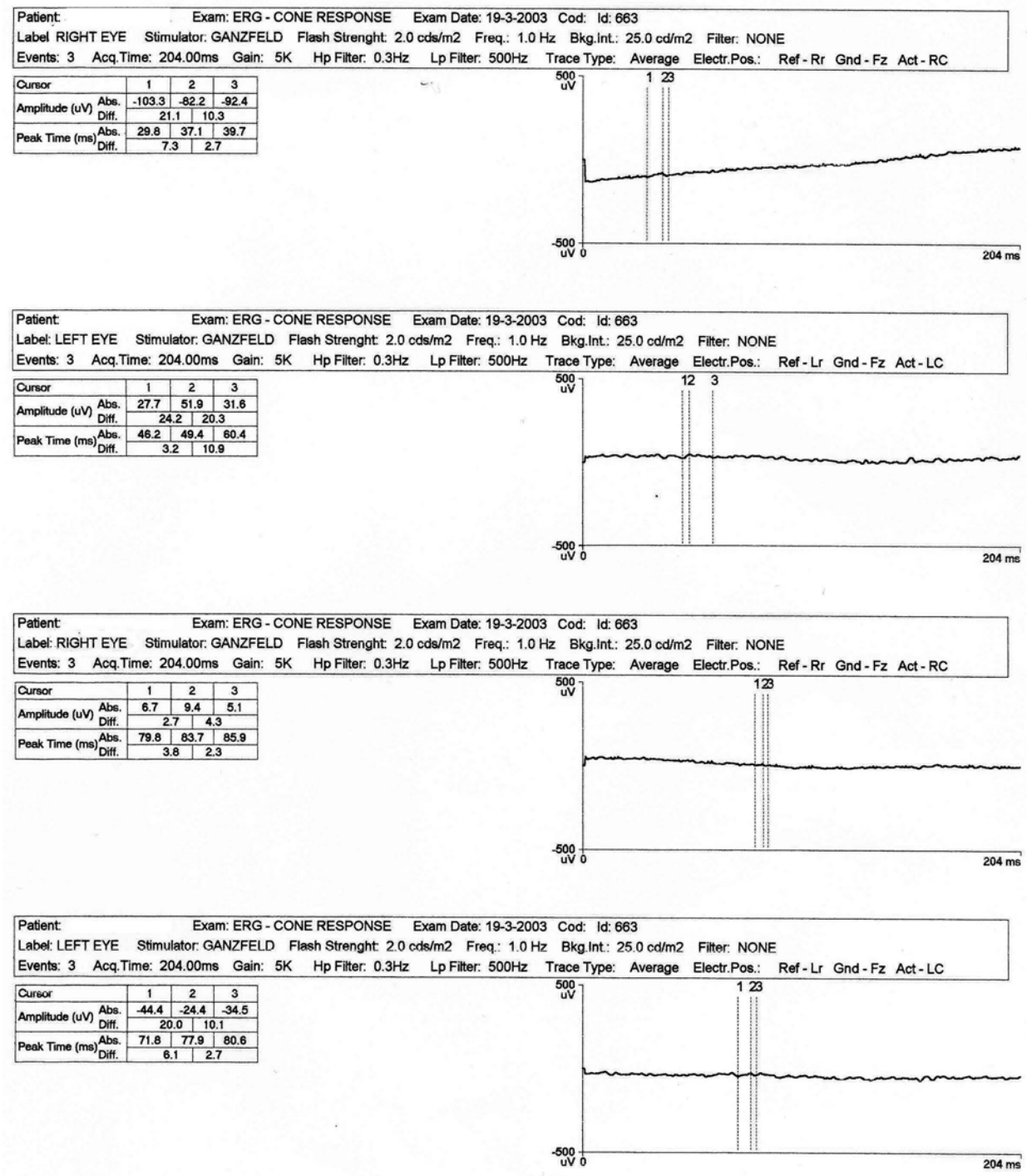

Fig. 5. On electroretinography, photopic and scotopic responses were greatly reduced, almost absent bilaterally (a = right eye).

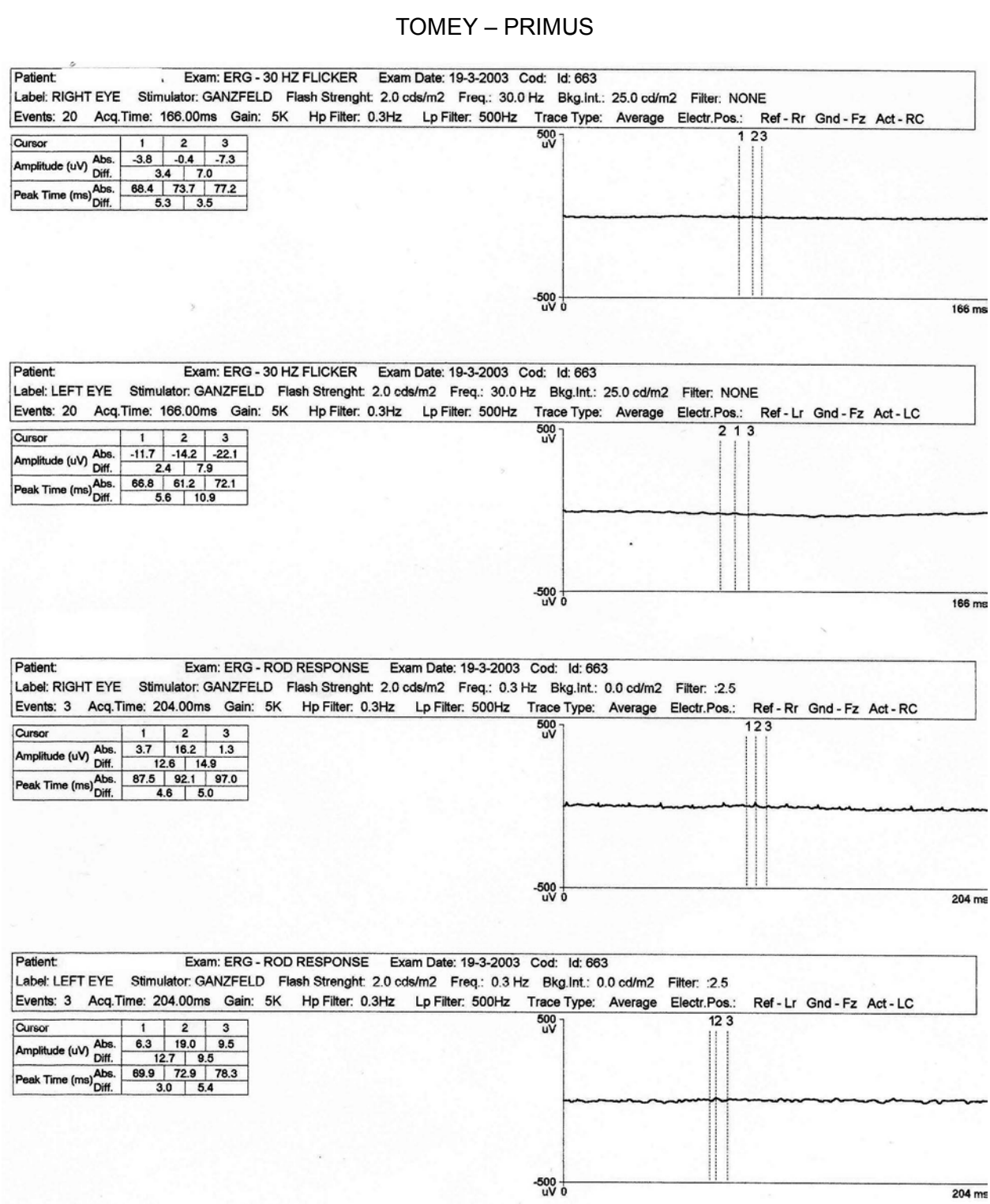

Fig. 5. On electroretinography, photopic and scotopic responses were greatly reduced, almost absent bilaterally (b = left eye).

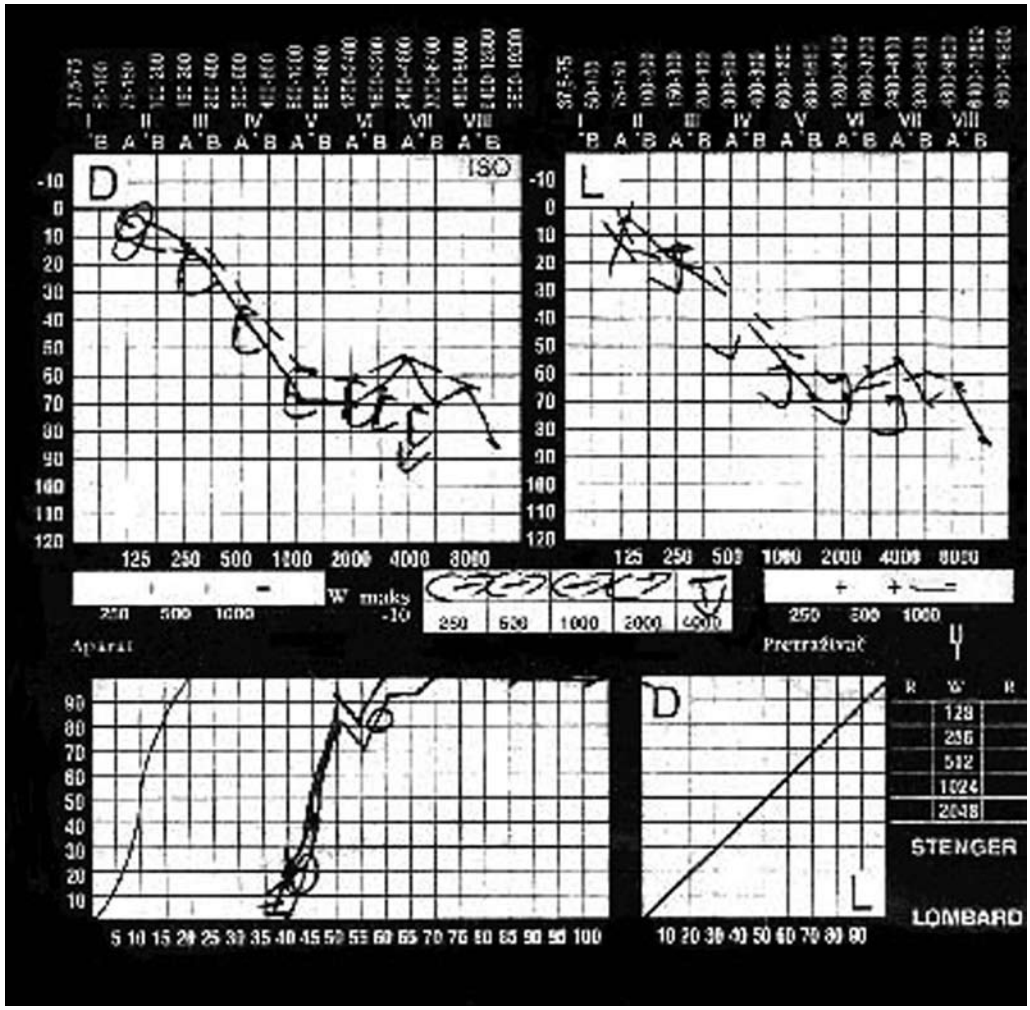

Fig. 6. Audiogram showed sensorineural hearing loss.

Usher's syndrome[17]. We diagnosed Usher's syndrome in a 30-year-old female patient. Although her hearing disorder had started in childhood and she had been wearing a hearing device from the age of five, unfortunately, a connection between her visual impairment and poor hearing had never been established.

Even though Usher's syndrome is rare, we must be aware of its existence when setting a final diagnosis in patients with severe sight and hearing impairments. Our patient is a clear example that the diagnosis of Usher's syndrome can be very difficult, particularly when atypical symptoms are prevalent. This case also shows that the patient's history is of utmost importance when establishing the diagnosis. Thus, it is an imperative to also maintain good communication with the patient and not rely only on our specific medical examination.

To date, considerable knowledge of Usher's syndrome has been attained. We have got an insight into the modalities of inheritance, clinical picture and diagnostic procedures[1-6]. Whilst rare, it is a serious disorder and therefore should be considered when examining persons with sight and hearing impairment, since Usher's syndrome is the most common type of deaf-blindness. Furthermore, we must also keep in mind its existence when examining hearing disabled patients with no pigmentation on the fundus, since they may have a rare type of retinitis pigmentosa sine pigmento, as in our patient.

Conclusively, since there is no successful treatment for Usher's syndrome to date, the best results in these patients can be achieved by early identification and thus timely initiation of rehabilitation, education, and

support programs, which in turn allow them to be incorporated in the society.

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Sažetak

RIJEDAK TIP USHEROVA SINDROMA

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Prikazan je vrlo rijedak oblik Usherova sindroma u tridesetogodišnje, 28 tjedana trudne bolesnice. Žalila se na gubitak vidne oštrine na lijevom oku, koja je trajala mjesec dana. Proveden je kompletan oftalmološki pregled, a nakon porođaja fluoresceinska angiografija, vidno polje (Goldmann i Octopus) i elektroretinograija. Na fundusu je nađen blijedi očni živac, difuzno suženje krvnih žila, dok pigmentacije na mrežnici nisu nađene, te edem lijeve žute pjege, likvefakcija staklovine i ablacija stražnje staklovine. Perimetrija po Goldmannu je pokazala suženje svih izoptera na 10°, a Octopus perimetrija smanjenje osjetljivosti perifernih dijelova mrežnice. Elektroretinografija je potvrdila dijagnozu pigmentoznog retinitisa bez pigmenta. Anamnestički se naknadno saznalo da je oštećenje sluha prisutno od djetinjstva. Prema našim spoznajama u literaturi je dosad opisan samo jedan slučaj ovakvog oblika retinitisa u Usherovu sindromu.

Ključne riječi: *Usherovi sindromi; Retinitis, pigmentozni; Gluhoća; Sljepoća; Prikaz slučaja*