Early Ultrasonographic Diagnosis of Retinal Detachment: Multidisciplinary Approach and Benefit

Emir Cabric¹, Nizama Sallhefendic¹, Muharem Zildzic¹, Zoran Licanin², Fahrudin Smajlovic²
¹Polyclinic and Primary Health Care Center, Doboj Jug, Bosnia and Herzegovina
²University Clinical Center of University of Sarajevo, Bosnia and Herzegovina

1. INTRODUCTION

High frequency ultrasonography of the eye is an ideal method for display of the eye structures. Although it is still 1950 discovered the importance of ultrasound in ophthalmology, it was the 1972 when it is introduced in clinical practice (Hewick) (1, 2). Since then, rapid technological development of ultrasound equipment with improved resolution expanded scope of indications, and led this method to a very important place in the diagnosis of eye diseases. It is very cheap, appliances are easy to handle, portable, the procedure itself is painless and the skill of interpretation of findings can learn the physicians of other specialties (3). Common pathological conditions such as retinal ablation, intraocular bleeding and tumors by this method can save sight and lives of patients. Sonography of the eye in 667 patients over two years revealed 27 retinal ablation and hemophthalmos in 36 patients. Every fifth patient with retinal ablation was referred by a doctor of family medicine. Knowing the possibilities of ultrasonography in ophthalmology, teamwork at the level of primary health care can open access to ultrasonography of the eye for other specialty physicians which can improve population health and provide a new quality in the prevention of vision loss.

Keywords: retinal ablation, ultrasound, emergency medicine, family medicine.

1.1. Retinal ablation and ultrasound

Retinal ablation is representing partial or complete separation of the sensory part from pigment part of the retina. In the space created by stratification accumulates fluid that prevents re-establishment of restitution and function of vision (3, 5).

Retinal ablation is often in practice, not only of ophthalmologists but also a doctor of family medicine, urgent and internal medicine. Completely separation of the retina leads to irreversible loss of vision, which is why this clinical entity is considered urgent situation that requires urgent diagnostic procedures and treatment. Delay in diagnosis leads to irreversible vision loss.

The pathogenesis of retinal ablation can be divided into three types:
- Rupture, or split of the retina: regenerative retinal ablation (Greek rhegma: cracking, fracture)
- Retinal traction or withdrawal: tractional retinal ablation
- Exudation and accumulation of fluid between the first and second layers of the retina – exudative retinal ablation.

The most common is regmatogenic retinal ablation, and it occurs by rupture of the first layer of the retina and entrance of liquid in the crack, and further separation of the sensory part from pigment retinal layers.

Retinal ablation is associated with many pathological processes of the eye such as congenital malformations, metabolic and degenerative disorders, injury of the eye and systemic disease of blood vessels (1, 3, 6). According to the above causes the retinal ablation can be divided into primary and secondary. Primary retinal ablation occurs due to the pathological process of the retina and vitreous body, mainly of degenerative nature, and the entry of liquid between the first and second layer, and further stratification. This type of retinal ablation often occurs in patients with myopia. Secondary ablation occurs due to pathological process caused by systemic diseases and injuries.

Risk factors for the occurrence of retinal ablation are myopia, aphacia or pseudofacia, injury, older age, diabetes mellitus with retinopathy, tumors, leukemia, angiomatose and other systemic diseases of blood vessels.

1.2. Symptoms of illness:

Symptoms are related to loss of retinal function, so the leading symptom is the weakening or loss of vision. Vision may be in the form of appearance dusty blur in front of the eye, photopsy, defects in the visual field, such as curtains, wry look items in sight and appearance of lights.

1.3. Diagnosis

It is important to raise doubt to the disease at an early stage, so about ba-
sic facts of the disease should be aware the doctors of primary health care and especially urgent medicine anamnestic problems and basic indicators of vision loss should alert physicians to the possibility to retinal ablation. In addition to the classic ophthalmological examination and control of the visual field a simple ultrasound examination should be the method of choice for final diagnosis. Quick access to ultrasound examination should exist in all ophthalmology centers (7, 8, 9, 10).

In some of the radiological emergency centers and institutions this simple overview is done also by radiologists and emergency medicine specialists. Of course that the final recommendation for the diagnosis and the treatment is given ophthalmologists. Such a multidisciplinary approach and the introduction of ultrasound in routine practice of eye overview could significantly reduce the permanent loss of vision in people with early acute retinal ablation (6, 11).

1.4. Treatment of retinal ablation

The goal of treatment of retinal ablation is an early closing of cracks and sticking together separated layers. These procedures may be in the form of surgery, cryotherapy, photocoagulation, using silicone glue and pneumatic retinopexy. Procedures done at an early stage can lead to a complete return of vision function.

2. PATIENTS AND METHODOLOGY

In the period from May 2007 to May 2009 recorded are patients ultrasound examinations made at the eye clinics Polyclinic Doboj–Jug Matuzici. On ultrasound examination of the eye are admitted all patients regardless of the way of referral. During this period in the eye clinic of polyclinic Doboj–Jug Matuzici we examined 7916 patients. The ultrasound review results were obtained by statistical analysis of relevant indicators that are tracked by each individual patient taken on the basis of anamnesis data verified and physical examination, including ultrasound examination as required. In 667 cases ultrasound of the eye was done. Ultrasound examinations of the eye were examined in serial sagittal and transverse direction. The patient received instructions about eye movements in different directions.

Figure 1 shows the equipment for ultrasound review of the eye.

By ultrasound in normal eye retina is not shown as a separate structure, but in case of ablation with liquid that separates the layers of the retina allows the ultrasonic beam to detect the thin hypoechoicogenic membrane which is separated from the back eye bulb wall.

Given that primary care physicians...
eye patients directly addressed by these doctors.

Ultrasound findings were analyzed in all patients examined. Access to ultrasound was open all working hours and in emergencies and after hours (per call). All patients in the preparative preparation for cataract were also subjected to ultrasound examination of the eyes. Eye surgery in Matuzici (Doboj – Jug) is geographically located on the border between the two entities and two large cantons of the Federation. Regardless of administrative borders and different insurance patients were equally admitted from all parts of Bosnia and Herzegovina.

3. RESULTS

The results are presented in form of tables and graphically. Within baseline retinal ablation was determined in 27 patients, and Hemophthalmos at 36 cases.

Table 3 shows that primary care physicians relatively frequently sent their patients to ultrasound of the eye, and that is addressed to the patients revealed retinal ablation and Hemophthalmos in relatively high percentage. Referred number of patients to eye ultrasound both from level of primary health care and other specialists is constantly increasing.

Patients with pathological findings of Hemophthalmos and retinal ablation were subjected, if necessary, to other ophthalmic procedures fundoscopy, bio-microscopy, CT and MRI.

Figures 2, 3 and 4 show ultrasound findings which verified retinal ablation in patients urgently addressed by the emergency medicine specialist and family doctor.

4. DISCUSSION

In traditional routine medicine, retinal ablation is diagnosed by ophthalmoscopy review. In many states such a view has been disabled due to changes in the lens, hiphema, bleeding in the vitreous body or because of contraindications (6, 9, 10). During the last few years ultrasound of the eye as a simple affordable and safe method is applicable in all circumstances, an important and unavoidable diagnostic procedure (1, 3).

The results of our study suggest that open access to ultrasonography of the eye in patients with risk factors and clinical signs of retinal ablation can detect retinal ablation disease at an early stage when intervention may be appropriate to save vision of the patient. Retinal ablation as the emergency situation in ophthalmology requires urgent or early ultrasonography of the eye.

5. CONCLUSION

Ultrasoundography of the eye provides an ideal image of different pathological conditions of the eye. The method is simple, painless and easily applicable in out-patient conditions. Application of this method in practice as emergency procedures in a multidisciplinary approach reveals retinal ablation in an early stage when the prognosis for preserving vision is very favorable.

REFERENCES


Corresponding author: Ass prof Nizama Salihifendic, MD, PhD. MedicusA ordinacija, Gracanica, BiH. E-mail: medicus.ord@bih.net.ba