Ipsilateral Posterior Subcapsular Cataract in a Young Patient with Hourglass-Like Narrowing of the Inferior Temporal Retinal Artery

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Key Words

Posterior capsular cataract · Cataractogenesis · Artery narrowing · Lenticular metabolism

Abstract

We present an interesting and rare case of subcapsular cataract coexisting with ipsilateral narrowing of the inferior temporal retinal artery in a young woman. The possible role of retinal vessel malformation in cataract pathophysiology is discussed.

Introduction

Metabolic disorders (diabetes), ischemic conditions (carotid occlusive disease), and use of drugs (corticosteroids) are potential causes of cataract development in affected individuals [1, 2]. Numerous previous studies proposed retinal vessel abnormalities as a potential predisposing factor for cataract formation [3, 4]. These abnormalities may be caused by retinal atrophy (due to degeneration, inflammation, trauma, treatment with diathermy, light, or cryopexy) or any vascular retinopathy [5].

We report a case of focal narrowing of the inferior temporal retinal artery (ITRA) in the right eye (OD) in a young patient who presented with decreased visual acuity due to ipsilateral subcapsular cataract, and discuss the possible role of retinal vessel irregularities in the pathophysiology of cataracts.

Case Report

A 42-year-old woman was referred to our department with visual decline in the OD that had been initially observed 6 months before. The patient had a clear medical record and received no medication except for hormone replacement therapy. Best-corrected visual acuity of her OD and left eye (OS) was 20/50 and 20/25, respectively. Slit-lamp examination revealed a posterior subcapsular cataract in the OD with no other pathological findings. There were no abnormal findings in the OS. Fundus examination of the OD revealed focal narrowing of the ITRA ([fig. 1a, b](#)). Fluorescein angiography confirmed this finding ([fig. 1c, d](#)), demonstrating filling defects in the retinal branches beyond the position of narrowing ([fig. 1e, f](#)). Retinal perfusion in the area of interest was measured by the Heidelberg Retina Flowmeter (HRF) [6]. Blood flow was evaluated in 10 different horizontal levels above and below the axial level defined by the retinal narrowing. Regional mean blood flow in this area (288.46 ± 33.70 arbitrary units, AU) was significantly less than in the same location in the contralateral eye (426.76 ± 39.1 AU) (z test, $p < 0.005$). The patient underwent uneventful phacoemulsification and subsequent implantation of a posterior chamber intraocular lens. One week after the operation, visual acuity had improved to 20/20 (OD).

Discussion

Previous reports proposed that extracranial cerebrovascular disease could lead to ischemic optic neuropathy and cataract development [7]. In the present case, carotid ultrasound examination showed no underlying carotid artery stenosis. Our patient had no history of alcohol use or smoking, which are considered risk factors for the development of age-related cataract [8]. The main abnormal finding was the focal narrowing of the ITRA, which resulted in a reduced retinal blood perfusion in the inferior quadrants, as revealed by HRF.

Tan et al. [9] recently investigated whether local nutritional and ischemic factors may be involved in cataract pathogenesis. Retinal vessel narrowing was described as a predictive risk factor for the development of posterior capsular cataract and cataract surgery. A reasonable explanation of this link was proposed 20 years ago by Hopkins [10], who demonstrated that narrowed retinal arterioles lead to a decreased blood flow and reduced supply of nutrients and antioxidants to the lens, thereby inducing cataract. Reduced oxygen delivery to the retina may cause disproportionate lipid peroxidation and accumulation of peroxidative products that could diffuse through the vitreous to the lens and trigger the mechanisms of cataractogenesis [11].

In view of these findings, it is assumed that the focal ITRA narrowing observed in our patient may have influenced the lenticular metabolism, inducing an ipsilateral cataract. A feasible hypothesis is that like generalized retinal arterial alterations, focal malformations may exert a cataractogenic effect because they reduce retinal blood flow in particular patients.

Fig. 1. Fundus examination of the OD shows narrowing of the inferior temporal retinal artery (black arrows, **a, b**). Fluorescein angiography reveals an hourglass-like narrowing of the inferior temporal retinal artery (red arrows, **c, d**). Filling defects are evident in the retinal branches beyond the narrowed section (yellow arrows, **e, f**).

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