

# Retinal Detachment due to Unrecognized Retinal Dialysis in a Patient with Choroidal Coloboma

Suzan DOGRUYA<sup>1</sup>, Ozcan Rasim KAYIKCIOGLU<sup>2</sup>

## ABSTRACT

Lower half retinal detachment was found in a young male patient with choroidal coloboma and vitreous turbidity. The treatment of the retinal detachment which was considered to originate from choroidal coloboma was lens aspiration, IOL implantation followed by 23 G Pars plana vitrectomy. Following core vitrectomy and perfluorocarbon injection, retinal dialysis was observed in the lower nasal area during the peripheral vitreous shaving using indentation. Our patient was only then correctly diagnosed as retinal detachment secondary to retinal dialysis was treated with PPV-endolaser and 16% C3F8 gas injection and in the post-operative period, the retina attached. Retinal dialysis was encountered in the patient without history of trauma in whom we thought retinal detachment was due to the subvisible tears in the coloboma. Peripheral retina and vitreous base should be examined in detail in all of our patients even if there are apparent causes for detachment as choroidal coloboma.

**Key Words:** Choroidal coloboma, Retinal detachment, Retinal dialysis.

## INTRODUCTION

Congenital ocular coloboma results from fetal fissure closure defect occurring at gestational week 5-7. It is associated with developmental defects such as microphthalmia and anophthalmia.<sup>1</sup> Retinal detachment is seen up to 40% of patients with chorioretinal coloboma.<sup>2</sup> In general, it occurs as a retinal detachment with break and in an acquired manner. The tear is generally within coloboma or at its margin. Lack of retinal pigment epithelium pump, myopia and vitreoretinal tractions facilitated by vitreous syneresis is implied in the etiopathogenesis.<sup>3,4</sup>

Retinal dialysis is separation of neurosensory retina from non-pigmented pars plana epithelium at ora serrata. It is seen in 10% of retinal detachments with break.<sup>5,6</sup> Retinal dialysis prevents spread of retinal pigment epithelium since base of vitreous is adhered to posterior aspect of dialysis in almost all retinal dialyses; thus, proliferative vitreoretinopathy (PVR) is lower (6%).<sup>7,8</sup> Majority of retinal detachments are seen as a result of trauma and at inferior temporal or nasal quadrants in general. It develops weeks or months after trauma by contraction of peripheral

retina. The fact that majority of patients are young male adults without established posterior vitreous detachment (PVD) can lead delay in diagnosis.<sup>8</sup> Thus, peripheral retina should be evaluated cautiously after trauma. Not all retinal dialyses necessarily lead retinal detachment and it remains localized by chorioretinal adhesion surrounded by pigment at peripheral retina. Here, we aimed to emphasize that there may be a problem in peripheral retina and peripheral retina should be carefully evaluated in a young man presented to our clinic with diagnoses of coloboma and retinal detachment.

## CASE REPORT

A 39-years old man working in a rehabilitation center for mental disability was referred to our clinic with suspected toxoplasmosis in left eye, coloboma and retinal detachment. There was no history of direct ocular trauma in the patient. In thorough ophthalmologic examination, visual acuity was full vision in right eye and hand movements in the left eye by Snellen charts. In biomicroscopic examination, anterior segment was normal in right and left eyes. Intraocular pressure was measured as 14 mmHg in right eye and 6

1- Ophthalmologist, Department Of Ophthalmology, Uşak University Training And Research Hospital, Uşak, Turkey

2- Prof. MD., Department Of Ophthalmology, Celal Bayar University Faculty Of Medicine, Manisa, Turkey

**Received:** 20.05.2019

**Accepted:** 23.08.2019

*Ret-Vit 2020; 29: 261-265*

DOI:10.37845/ret.vit.2020.29.47

**Correspondence Adress:**

Suzan DOGRUYA

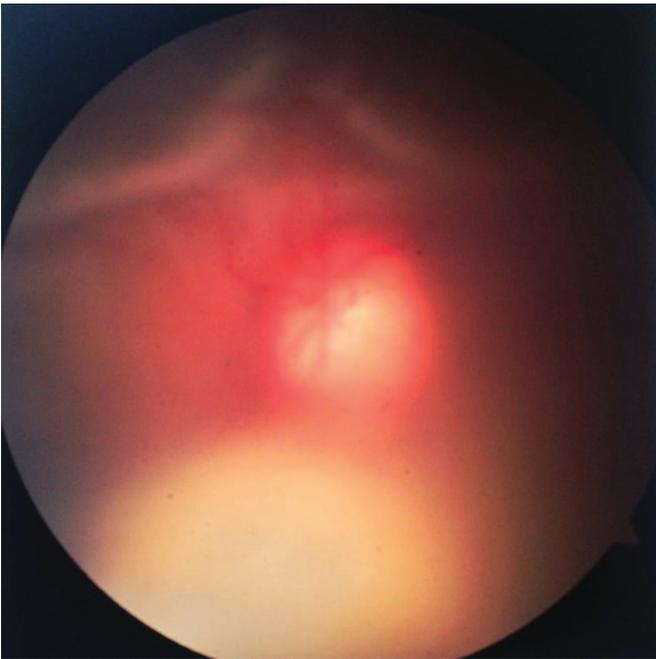
Department Of Ophthalmology, Uşak University Training And Research Hospital, Uşak, Turkey

**Phone:** +90 276 224 0000

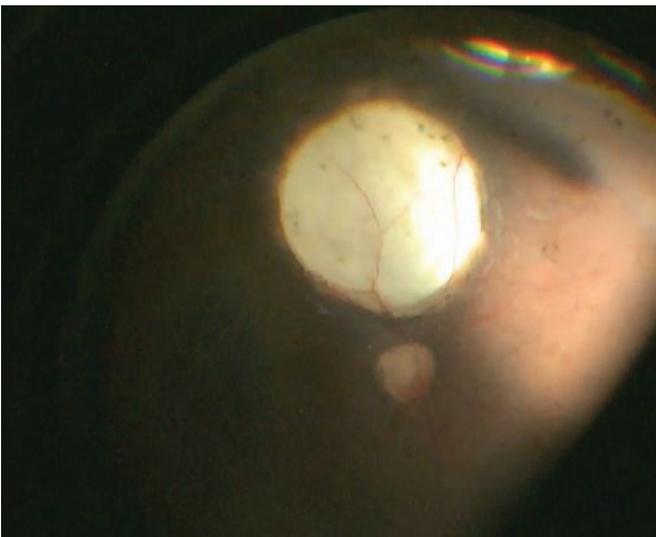
**E-mail:** sdogruya@hotmail.com

mmHg in left eye. In fundus examination, retina and optic nerve were found to be normal in right eye while fundus image was blurred because of vitreous cells and haze in left eye. There was a coloboma not fusing with optic nerve and retinal detachment at inferior region of optic nerve. A choroidal detachment accompanying to hypotonia was observed (Picture 1). Orbital sonography was compatible with choroid detachment and retinal detachment at inferior quadrant in left eye. Due to presence of retinal detachment, biometric measurements of intraocular lens (IOL) were

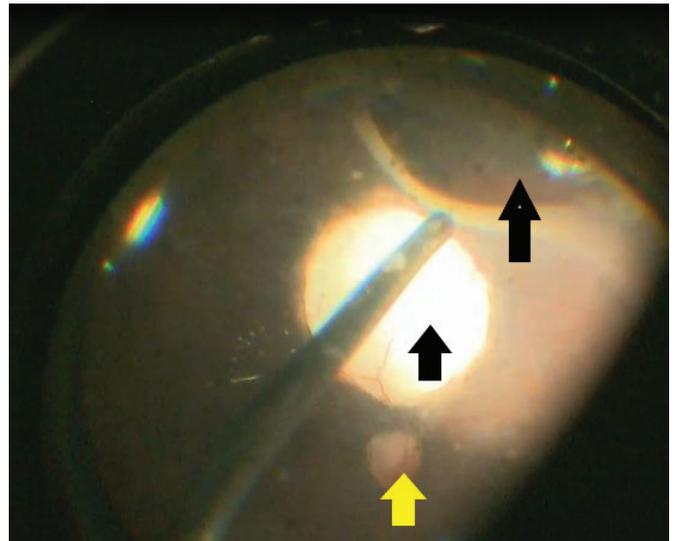
performed according to contralateral eye. In the patient, lens aspiration in left eye, IOL implantation followed by pars plana vitrectomy were performed and retinal dialysis was observed at inferior nasal region during indentation examination (Picture 2, 3). Barrier laser was performed to margin of coloboma and posterior to dialysis area (Picture 4, 5) and surgery was completed by 16% C3 F8 gas injection (Picture 6, 7). At the end of 19-months follow-up, visual acuity was improved to 0.7 by Snellen chart. In fundus examination, a coloboma area, laser scars



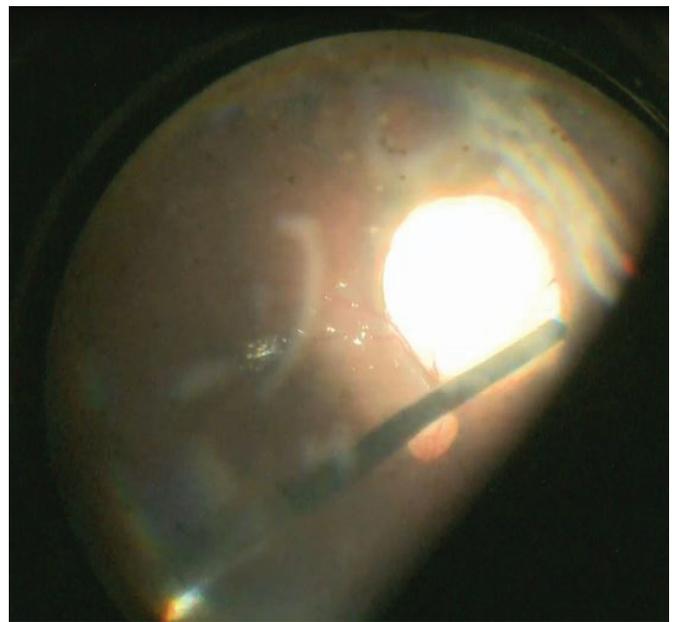
**Picture 1.** Fundus image of the case having retinal detachment and chorioretinal coloboma with choroid detachment.



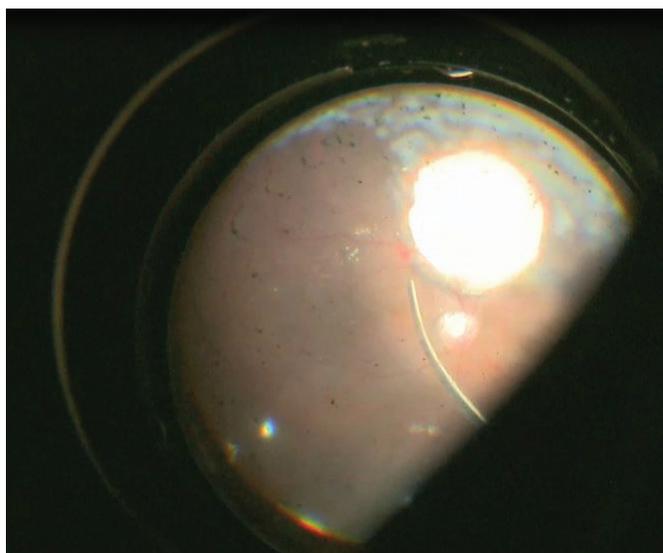
**Picture 2.** Intraoperative fundus image of chorioretinal coloboma case with retinal dialysis at inferior nasal quadrant.



**Picture 3.** Fundus image of chorioretinal coloboma case with retinal dialysis; retinal dialysis (big black arrow), coloboma (small black arrow); optic nerve (yellow arrow).



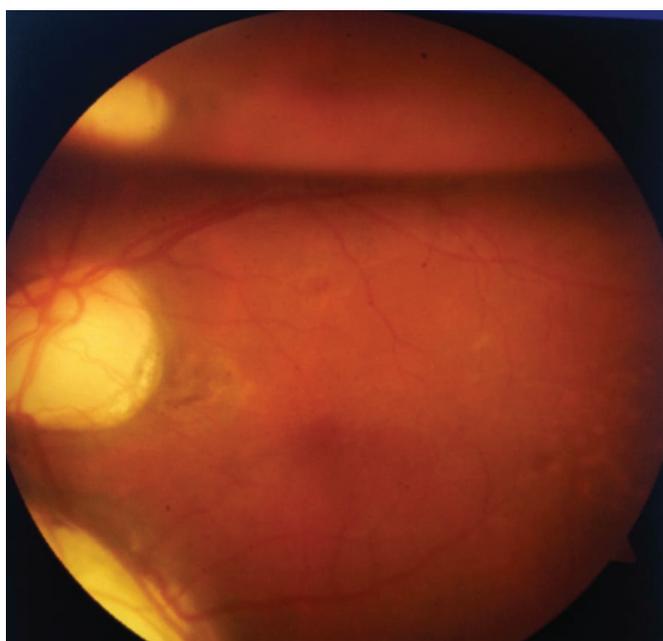
**Picture 4.** Fundus image of chorioretinal coloboma case underwent barrier laser therapy at posterior margin of retinal dialysis.



**Picture 5.** Fundus image of chorioretinal coloboma case underwent barrier laser therapy at posterior margin of retinal dialysis and margins of choroidal coloboma.



**Picture 7.** Anterior segment image of chorioretinal coloboma case following PPV and IOL.

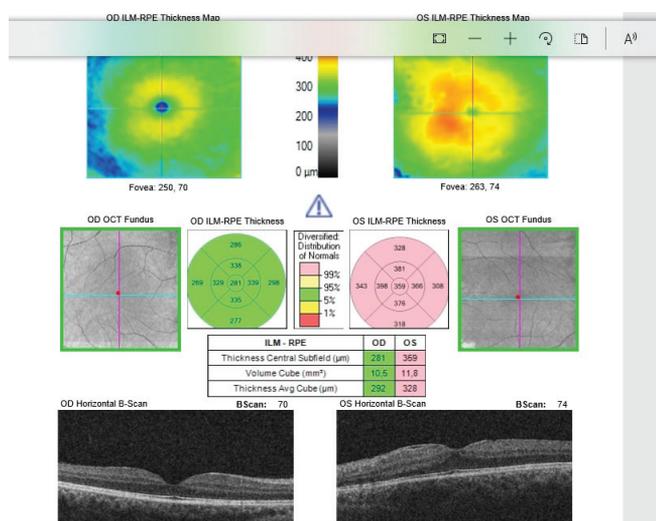


**Picture 6.** Fundus image of chorioretinal coloboma case following PPV plus 16% C3F8.

at posterior to area of retinal dialysis region and at margin of coloboma and attached retina were observed. There was epiretinal membrane (ERM) was observed in left eye on optic coherence tomography (OCT) (Picture 8).

## DISCUSSION

The blunt ocular trauma can manifest as various clinical conditions ranging from retinal edema to retinal detachment. The severity of impact and characteristic of vitreoretinal pathologies are also important. Blunt trauma can lead dialysis at anterior margin of base of vitreous,



**Picture 8.** Epiretinal membrane can be seen on OCT after PPV and laser therapy around retinal dialysis and coloboma in the patient with initial diagnosis of choroid coloboma and retinal detachment.

vitreous avulsion, macular hole, horseshoe tear and retinal dialysis at posterior margin of base of vitreous.<sup>9</sup>

Acute rhegmatogenous retinal detachment is not necessarily seen following blunt trauma. Since these patients are generally young, vitreous acts as a tamponade at region of dialysis or tear. By liquefaction of vitreous over time, fluid moves beneath retina, resulting in detachment. This depends on age, extent of tear, localization and severity of trauma. Tears at inferior regions progress slowly.<sup>10</sup>

Danny Mitry et al. evaluated clinical characteristics and predisposing factors in 1130 cases with retinal detachment accompanied by tear.<sup>7</sup> Authors found that 5.9% of retinal

detachment caused retinal dialysis and that there was trauma in 10.3% of all types of retinal detachment with tear (horseshoe tear, giant retinal tear, hole, retinal dialysis and retinoschisis). Trauma was detected in 55.2% of retinal detachments with retinal dialysis. In posttraumatic retinal dialysis, the most common localizations for detachments not involving posterior vitreous were inferior temporal (66.7%), superior temporal (20%), superior nasal (9.3%) and inferior nasal (4%) quadrants.<sup>7</sup> Our case had some characteristics such as lack of history of direct ocular trauma, coloboma scar not fusing with optic nerve at inferior region of optic nerve in retinal examination and retinal dialysis seen inferior nasal quadrant. Thus, definitive diagnosis was made by peripheral retinal indentation during surgery. Toxoplasmosis was considered in differential diagnosis since fundus was observed to be blurred due to vitreal dimness. In the patient, lack of clear history of trauma is thought to be due to fact that the patient considers impacts during daily life as unremarkable since he was working in a rehabilitation facility for mental disabilities. In detailed history, it was seen that he was exposed to several impacts on head and trunk due to his job.

The treatment in retinal detachment caused by tear outside of coloboma area are similar to those developed in eyes without coloboma.<sup>3,11</sup> However, different modalities are considered if retinal detachment is developed within coloboma area.<sup>12</sup> The success rate for traditional surgery was reported as 57% in retinal detachment in eyes with coloboma.<sup>13</sup>

In recent years, drainage of subretinal fluid, laser photocoagulation and intraocular tamponade together with PPV are preferred treatment modality.<sup>3, 11, 14</sup> Unlu et al. performed scleral buckling in 5 and pars plana vitrectomy plus silicone tamponade in 2 of 7 patients with choroidal coloboma-related retinal detachment. Retina was attached in all 7 eyes and visual acuity was  $\geq 20/400$  in 5 eyes (71.4%).<sup>15</sup>

Ramezani et al. performed pars plana vitrectomy in 25 and scleral buckling in 3 of 28 patients with chorioretinal coloboma-related retinal detachment. Authors used silicone as tamponade in 23 eyes and 20% sulfur hexafluoride in 2 eyes. Retina was attached in 26 eyes after mean follow-up of 40 $\pm$ 36 months. Mean visual acuity was finger counting at 2 meters.<sup>11</sup>

Chang et al. performed scleral buckling in 16 eyes of 15 patients with retinal detachment secondary to retinal dialysis. Of the cases, 80% were male and 75% were associated with a trauma. The most common localization for dialysis was inferotemporal region (63%). Visual acuity gain was observed in 9 patients. Pars plana vitrectomy

was required in 2 patients (13%) with recurrent retinal detachment.<sup>16</sup>

Jan et al. investigated safety and effectiveness of scleral buckling surgery in 48 eyes with retinal detachment due to retinal dialysis. Of cases, there was macular detachment in 85.4% and grade C proliferative vitreoretinopathy in 25%. Authors reported retinal attachment rate as 95% following single buckling surgery.<sup>17</sup>

Scleral buckling surgery is less commonly used today.<sup>18, 19</sup> However, scleral buckling can be employed in retinal dialysis-related retinal detachment, particular in pediatric patients where positioning is challenging. Thus, premature cataract development, iatrogenic retinal tear and gas- or silicone-related complications can be decreased.<sup>20</sup>

Our case was considered as choroidal coloboma-related retinal detachment; thus, pars plana vitrectomy plus 16% C3F8 tamponade was planned. Biometric intraocular lens measurements were performed according to contralateral eye due to retinal detachment. After clearance of blurred vitreous, retinal dialysis was observed at inferior nasal region via indentation during surgery. If retinal dialysis could be identified before surgery, we might attempt classical detachment surgery.

In conclusion, coloboma-related retinal detachment was considered in our patient; however, retinal dialysis was encountered at peripheral retina during surgery. Although an apparent cause for retinal detachment can be observed, detailed assessment of peripheral retinal can be important to identify different etiologies.

## REFERENCES

1. Raval V, Rao S, Das T. Ocular albinism with bilateral ocular coloboma - A rare association. *Indian J Ophthalmol* 2019; 67: 397-8.
2. Steahly LP. Retinochoroidal coloboma: varieties of clinical presentations. *Ann Ophthalmol* 1990; 22: 9-14.
3. Gopal L, Badrinath SS, Sharma T, Parikh SN, Shanmugam MS, Bhende PS, Agrawal R, Deshpande DA. Surgical management of retinal detachments related to coloboma of the choroid. *Ophthalmology* 1998; 105: 804-9.
4. Brown G. *Coexistent optic nevre and macular abnormalities In Yanoff M and Duker JS: Ophthalmology.* . The CV Mosby Co.: St. Louis, 1999.
5. Zion VM, Burton TC. Retinal dialysis. *Arch Ophthalmol* 1980; 98: 1971-4.
6. Kinyoun JL, Knobloch WH. Idiopathic retinal dialysis. *Retina* 1984; 4: 9-14.
7. Mitry D, Singh J, Yorston D, Siddiqui MA, Wright A, Fleck BW, Campbell H, Charteris DG. The predisposing pathology and clinical characteristics in the Scottish retinal detachment study. *Ophthalmology* 2011; 118: 1429-34.

8. Qiang Kwong T, Shunmugam M, Williamson TH. Characteristics of rhegmatogenous retinal detachments secondary to retinal dialyses. *Can J Ophthalmol* 2014; 49: 196-9.
9. Ryan S. "Retina" Second edition, Vol. III: Mosby Company, 1994.
10. Albert D JF, Robinson N,. "Principles and practice of ophthalmology", Vol. II: W.B. Saunders Company, 1994.
11. Ramezani A, Dehghan MH, Rostami A, Ahmadi H, Entezari M, Soheilian M, Azarmina M, Moradian S, Yaseri M. Outcomes of retinal detachment surgery in eyes with chorioretinal coloboma. *J Ophthalmic Vis Res* 2010; 5: 240-5.
12. Gopal L, Kini MM, Badrinath SS, Sharma T. Management of retinal detachment with choroidal coloboma. *Ophthalmology* 1991; 98: 1622-7.
13. Jesberg DO, Schepens CL. Retinal detachment associated with coloboma of the choroid. *Arch Ophthalmol* 1961; 65: 163-73.
14. Corcostegui B, Guell JL, Garcia-Arumi J. Surgical treatment of retinal detachment in the choroidal colobomas. *Retina* 1992; :12 237-41.
15. Unlu N, Kocaoglan H, Acar MA, Aslan BS, Duman S. Surgical management of retinal detachment with choroidal coloboma. *Eur J Ophthalmol* 2002; 12: 299-303.
16. Chang JS, Marra K, Flynn HW, Jr., Berrocal AM, Arroyo JG. Scleral Buckling in the Treatment of Retinal Detachment Due to Retinal Dialysis. *Ophthalmic Surg Lasers Imaging Retina* 2016; 47: 336-40.
17. Jan S, Hussain Z, Khan U, Khan MT, Karim S. Retinal Detachment Due to Retinal Dialysis: Surgical Outcome After Scleral Buckling. *Asia Pac J Ophthalmol (Phila)* 2015; 4: 259-62.
18. Bakri SJ, Alniemi ST, Chan RV. Experiences of vitreoretinal surgery fellows in the United States. *Retina* 2013; 33: 392-6.
19. Williams PD, Hariprasad SM. Evolving trends in primary retinal detachment repair: microincisional vitrectomy and the role of OCT. *Ophthalmic Surg Lasers Imaging Retina* 2014; 45: 268-72.
20. Heimann H, Bartz-Schmidt KU, Bornfeld N, Weiss C, Hilgers RD, Foerster MH. Scleral buckling versus primary vitrectomy in rhegmatogenous retinal detachment: a prospective randomized multicenter clinical study. *Ophthalmology* 2007; 114: 2142-54.