Commentary: Surgical challenges associated with the management of retinal detachment associated with chorioretinal coloboma

Ocular coloboma is a congenital defect caused by incomplete closure of the embryonic fissure during embryonic development. It can cause defects in the iris, crystalline lens, zonules, ciliary body, retina, choroid, and/or optic disc.[1] Nakamura *et al*.[2] reported isolated anterior segment, isolated posterior segment and involvement of both in around 36%, 39% and 24% cases respectively. The incidence of choroidal coloboma in the general population has been estimated to be around 0.14%.[3] It can be associated with retinal detachment (RD) in 2.4%–47.5% of eyes.[1] Uhumwangho *et al*.[4] showed that the chances of RD increased by a factor of 1.147 per year of the patient's age. Histological studies have shown that the neurosensory retina is replaced by a rudimentary structure called intercalary membrane (ICM), while retinal pigment epithelium, Bruch's membrane, choriocapillaris and choroid are absent.[1]

RD associated with chorioretinal coloboma are usually difficult to manage and multiple surgeries may be required to achieve retinal reattachment.[5] Such eyes are often associated with microphthalmia or microcornea.[1,3] The sclerotomies need to be constructed anteriorly in microphthalmic eyes to prevent retinal dialysis near the sclerotomy sites.[1] However, this makes the maneuverability during the surgery difficult due to the larger diameter of the wide-angle viewing systems. It is important to differentiate between microphthalmos and microcornea as the ora serrata in eyes with microcornea is located posteriorly (7.6 mm, Range 6.1–9.0 mm), even more posterior than the normal eyes (6.2 mm; Range 5.1–7.2 mm).[5] The induction of posterior vitreous detachment (PVD) is another surgical challenge in such eyes. The failure to induce PVD completely can result in re-detachment due to the persistent unrecognized traction at the retina-coloboma margin. The perfluorocarbon liquid–assisted mega Weiss-ring technique can be helpful to assist PVD in these eyes.[6] The peeling of the epiretinal membrane (ERM) and internal limiting membrane (ILM) can further ensure that the posterior hyaloid has been completely removed. However, peeling may be difficult in eyes with macula-involving coloboma due to the poor contrast at the posterior pole.

The extension of the ICM detachment into the normal retina should be searched diligently. This fluid could indicate persistent communication between the sub-ICM and the sub-retinal space, and can result in recurrent RD. The higher magnification provided by the digitally-assisted vitreoretinal surgery platforms can help in performing the various surgical maneuvers.[7] Intraoperative optical coherence tomography (iOCT) can further assist in identification of the fluid and ICM break(s) as well as peeling of ERM and ILM.[8] The shallow detachment may often be caused by a taut ICM. In such a condition, air tends to enter the sub-ICM space during fluid-air exchange, leading to lifting up of the ICM like a trampoline. Such a traction can be relieved by making relaxing cuts in the ICM. However, care must be exercised to avoid the avulsion of the major blood vessels that traverse the ICM and supply the retina beyond the coloboma.

We congratulate the authors for their large series evaluating the surgical outcomes of RD associated with coloboma along with the risk factors for recurrence of RD.[9] The authors reported that most of the eyes with RDs were associated with coloboma types 1, 2, and 3 (Ida Mann classification). Earlier, Uhumwangho *et al*.[4] had shown that the odds of development of RD reduced by a factor of 0.653 with increasing coloboma grade. A significant number of patients reported by the authors belonged to the pediatric age group and presented late with advanced proliferative vitreoretinal (PVR) changes.[9] This

makes encircling band, lensectomy, subretinal band removal, and/or relaxing retinectomy (RR) necessary. However, we suggest avoiding RR during the first surgery as the remnant vitreous may result in severe infolding due to anterior and/or posterior PVR.[10] The authors have also shown that RR was a significant risk factor for retinal re-detachment.[9] Hence, RR should be reserved for the second or third surgery. Evaluating the grade of PVR as a risk factor for the recurrence of RD can give more insight.

We agree with the authors that like other pathologies, microincision vitrectomy surgery (MIVS) has improved the surgical outcomes of eyes with RD associated with choroidal coloboma also.[9] The authors also reported that the eyes with disc-involving coloboma were at a higher risk of re-detachment. However, the difference did not approach statistical significance.[9] Earlier Gopal *et al*.[11] classified coloboma based on the status of the optic nerve head (ONH). They showed that eyes with severe ONH involvement are associated with microphthalmos, high myopia, poor visual acuity, advanced visual fields defect, and extensive choroidal coloboma. The higher risk of recurrence of RD in the eyes with ONH involvement may be due to a combination of these factors. The authors have reported that the location of primary breaks (within coloboma vs coloboma and periphery) doesn't influence the rate of retinal re-detachment.[9] Similarly, the absence of primary breaks (RD Type IIE) should also be evaluated as a risk factor.

It is imperative to counsel the patient and his/ her attenders that despite a good anatomical outcome, the functional outcome may be poor. Also, the high risk of glaucoma and its further management should be explained.

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References

1. Lingam G, Sen AC, Lingam V, Bhende M, Padhi TR, Xinyi S. Ocular coloboma-A comprehensive review for the clinician. Eye (Lond) 2021;35:2086-109.
2. Nakamura KM, Diehl NN, Mohney BG. Incidence, ocular findings, and systemic associations of ocular coloboma: A population-based study. Arch Ophthalmol 2011;129:69-74.
3. Liu T, Zhang M, Xu B, Wang W, Lee J, Gao Y, *et al*. Evaluation of the safety of sclerotomy incision in patients with choroidal colobomas with/without associated microcornea. Retina 2014;34:2300-5.
4. Uhumwangho OM, Jalali S. Chorioretinal coloboma in a paediatric population. Eye (Lond) 2014;28:728-33.
5. Kannan NB, Sen S, Kohli P, Ramachandran O, Ramasamy K. Clinical spectrum and long-term anatomical and functional outcomes of pars plana vitrectomy in retinal detachments associated with choroidal coloboma. J Vitreoretin Dis 2020;4:103-9.
6. Babu N, Kumar J, Kohli P, Ramasamy K. Perfluoro-n-octane-assisted mega Weiss-ring technique for posterior vitreous detachment induction in retinal detachment. Indian J Ophthalmol 2019;67:1463-5.
7. Babu N, Kohli P, Jena S, Ramasamy K. Utility of Digitally assisted vitreoretinal surgery systems (DAVS) for high-volume vitreoretinal surgery centre: A pilot study. Br J Ophthalmol 2020;104:432-6.
8. Lytvynchuk LM, Glittenberg CG, Ansari-Shahrezaei S, Binder S. Intraoperative optical coherence tomography assisted analysis of pars Plana vitrectomy for retinal detachment in morning glory syndrome: A case report. BMC Ophthalmol 2017;17:134.
9. Shenoy P, Katre PS, Kohli GM, Sen A, Agarwal M. Coloboma associated retinal detachment: Anatomical and functional results in the era of microincision vitrectomy surgery with an evaluation of risk factors for a recurrence. Indian J Ophthalmol 2022;70:2498-504.
10. Beuste T, Rebollo O, Parrat E, Guigou S, Mérité PY, Meyer F, *et al*. Recurrences of retinal detachment after retinectomy: Causes and outcomes. Retina 2020;40:1315-24.
11. Gopal L, Badrinath SS, Kumar KS, Doshi G, Biswas N. Optic disc in fundus coloboma. Ophthalmology 1996;103:2120-7.

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