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Case Report: Retinopathy of Prematurity with Glaucoma

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Abstract: ***Retinopathy of prematurity is a potentially blinding disease that affects the retinal vasculature of preterm babies and is emerging as an important cause of childhood blindness. Glaucoma is a well - recognized complication of ROP that may be associated with immature development of the anterior chamber, ROP itself or as a complication of treatment. Various cases of elevated IOP in ROP - treated eyes have been reported, including shallowing of the anterior chamber due to pupillary block or synechiae, in the short and long term. In this case report, we describe the course of a male infant born at 32 weeks 1 day, weighing 2kg, and kept on bubble CPAP for 8 days. On screening, the child had treatment requiring ROP and underwent lens - sparing vitrectomy with endolaser and subsequently developed raised intra - ocular pressure with shallow anterior chamber for which trabeculotomy with trabeculectomy was performed. On the follow - up visit, IOP was within the normal range.***

Keywords: ROP, secondary glaucoma, lens sparing vitrectomy, combined trabeculotomy and trabeculectomy

1. Introduction

Retinopathy of prematurity (ROP) or retrolental fibroplasia is a disease affecting retinal capillary proliferation in premature infants receiving supplemental oxygen therapy. Vasculature development in the nasal and temporal quadrants is not complete until 32 and 40 weeks, respectively. Exposure to oxygen at birth rapidly changes this state of hypoxia to hyperoxia, leading to delayed retinal vascularisation.

Glaucoma is a well - recognized complication of ROP, that may be associated with immature development of the anterior chamber, ROP itself, or as a complication of treatment. It can be caused by the lens - iris diaphragm being pushed forward by retrolental tissue, pupillary block or neovascularization. [1, 2]

In this case report, we describe the course of a male infant born at 32 weeks 1 day, weighing 2kgs, and was kept on bubble CPAP for 8 days. On screening, the child had treatment requiring ROP and underwent lens - sparing vitrectomy with endolaser and subsequently developed raised intra - ocular pressure with shallow anterior chamber for which trabeculotomy with trabeculectomy was performed. On the follow - up visit, IOP was within the normal range.

2. Case Report

A 2 kg male infant was born at gestational age of 32 weeks 1 day via LSCS in view of antepartum haemorrhage and had a weak cry with a heart rate of less than 100 bpm. The child was kept on bubble CPAP with 30% FiO_2 and 6 PEEP for 8 days. On routine ROP screening at corrected gestational age of 38 weeks 6 days, the baby was diagnosed to have Both Eye Zone 2 Stage IVa ROP with a tractional retinal detachment of more than 4 clock hours in the Right eye and less than 4 clock hours in the Left eye.

For the same, he underwent Right eye Lens Sparing Vitrectomy with Endolaser followed by Left eye Pan retinal photocoagulation. Upon subsequent follow - up, a mild corneal haze was noted in the right eye. IOP was 38 and 12 mmHg in the right and left eye respectively with Perkins Tonometer. Other parameters were as follows (Table 1)

Table 1: Biometry parameters

	Right eye	Left eye
WTW	12	11
Axial length	23.38	19.50
Ac Depth	3.21	3.10

The cup disc ratio was 0.2 in both eyes and peripheral anterior synechiae was seen in the superior and temporal quadrant in the right eye. In the nasal and inferior quadrant, Schwalbe's line was seen while trabecular meshwork was seen in all four quadrants in the left eye. The child was started on G. Dorzolamide+ Timolol 1 drop Right eye BD and underwent Right eye combined Trabeculotomy + Trabeculectomy under general anaesthesia. (Figures 1 to 4)

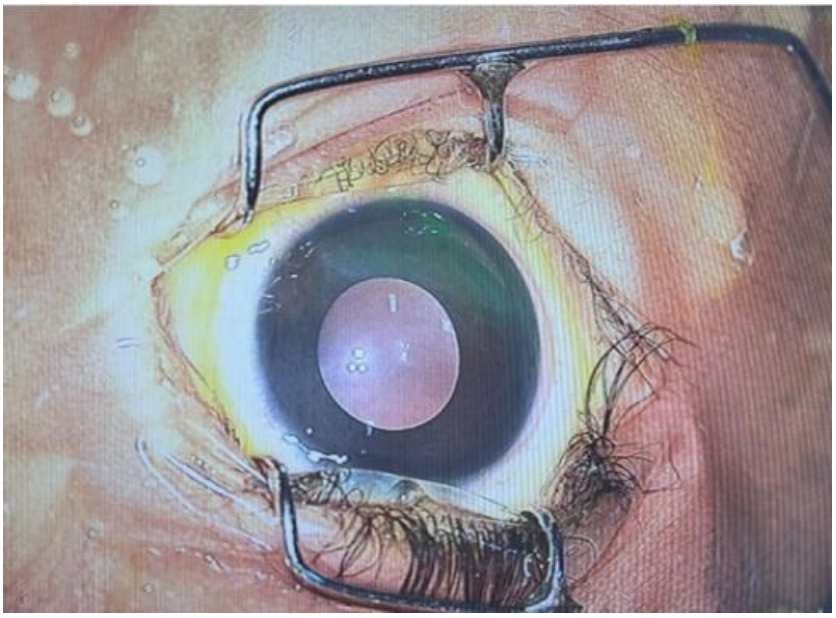

Figure 1: Intraoperative picture of right eye.

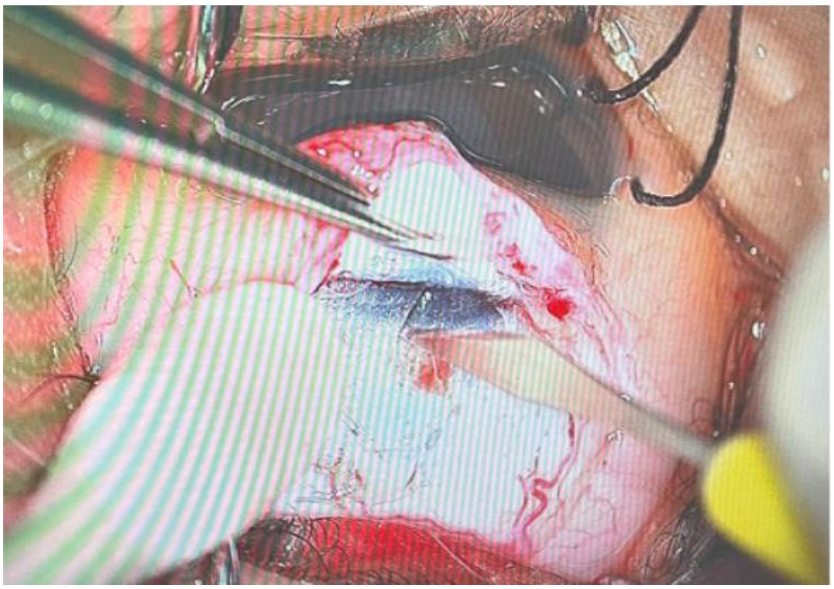

Figure 2: Partial thickness scleral flap raised and sclerostomy done.

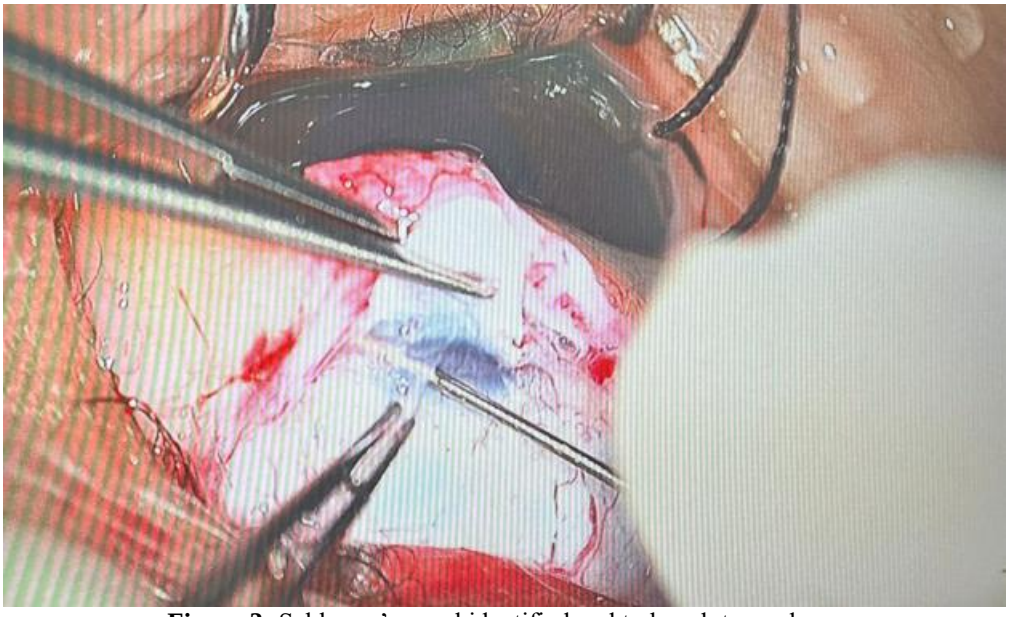

Figure 3: Schlemm's canal identified and trabeculotomy done.

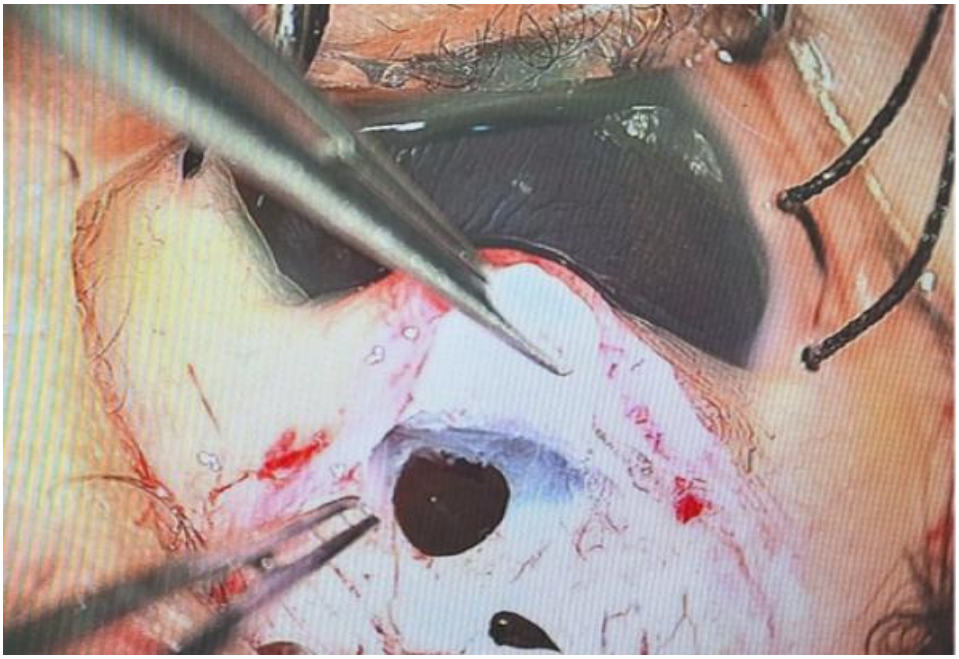

Figure 4: Peripheral iridectomy at 12 clock hours.

Postoperatively, the child was noted to have an IOP of 10 mmHg and 12 mmHg in the right and left eye respectively, and was started on tapering doses of antibiotic steroids. (Figure 5)

Figure 5: 1 week post operative picture.

On subsequent follow - ups, IOP was within normal range and the child had a stable retina.

3. Discussion

Treatment of ROP has known complications such as cataract, inflammation, vitreous haemorrhage, retinal detachment and glaucoma. The pathogenesis of glaucoma in ROP has various proposed mechanisms including incomplete development of the anterior segment and secondary angle closure from ROP or the treatment of ROP.

The Early Treatment for Retinopathy of Prematurity Trial (ETROP) reported a glaucoma prevalence of 1.67% (12/718). Among these cases, 11 children received laser therapy for high - risk pre - threshold retinopathy of prematurity. [3]

Few cases of glaucoma in the short - term postoperative period after laser therapy have been reported. A report from Australia describes the case of a male infant with Zone 3 Stage 2 ROP who received laser therapy and was later found to have angle closure in the right eye with pupillary block as well as a narrow - angle in the left eye. [4]

In another case report by Lenis TL et al, a female infant born at 24 weeks and 5 days of gestational age with treatment requiring ROP was found to have elevated IOP and shallow anterior chambers without pupillary block post - laser therapy. [5]

In premature infants, angle anatomy is susceptible to many factors causing angle closure as trabecular meshwork development is not complete until after 25 weeks. [6] In premature infants with retinopathy of prematurity, changes in the anterior segment of the eye, including a steeper corneal curve, shallower anterior chamber, thicker lens, and forward rotation of the ciliary body, may be intensified by incomplete retinal development. This underdeveloped retina can disrupt the normal growth signals for anterior segment formation, potentially worsening these ocular alterations. [7]

In our case, it is possible that underdevelopment of the anterior chamber, as well as ROP may have put the child at an increased risk of glaucoma which was exacerbated after vitrectomy. Hence careful anterior segment examination in ROP infants must be done to rule out glaucoma risk factors. Early detection and intervention are crucial to mitigate these risks and improve long - term visual outcomes.

4. Conclusion

In conclusion, the multifaceted complications associated with ROP and its treatment, particularly the heightened risk of glaucoma, highlight the importance of vigilant monitoring

and thorough examination of the anterior segment in affected infants.

By understanding the intricate relationship between ROP and its complications, healthcare providers can better navigate the challenges in managing these vulnerable patients.

Disclosure
The Authors report no conflict of interest in this work.

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