Editorial

Postoperative Management of Congenital Cataracts: Challenges and Strategies

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Congenital cataracts are a leading cause of childhood blindness worldwide, particularly affecting populations in developing countries where access to timely surgical interventions may be limited.[1] Approximately 200,000 children globally suffer from visual impairment due to cataract each year, underscoring the urgent need for effective surgical and postoperative management strategies.[2] The prevalence of childhood cataract in low-income countries was reported to be between 0.42 and 2.05 per 10,000, compared to 0.63 to 13.6 per 10,000 in high-income countries.[2] The management of postoperative complications, such as myopic shift, inflammation, glaucoma, amblyopia, and infection, is critical for preserving vision in these young patients. However, long-term follow-up and family involvement also play a central role in ensuring the best possible visual outcomes.

Postoperative inflammation is a frequent complication of congenital cataract surgery, primarily resulting from surgical trauma and the release of inflammatory mediators. This inflammation can lead to the formation of posterior synechiae, fibrous membranes, and visual axis opacification, which may significantly impede visual rehabilitation. Chronic inflammation can lead to secondary glaucoma.[3] Topical corticosteroids, such as prednisolone acetate, are typically prescribed immediately after surgery and tapered over several weeks, depending on the severity of inflammation. In cases of severe inflammation, systemic corticosteroids may be indicated. Non-steroidal anti-inflammatory drugs (NSAIDs) can also be used adjunctively to reduce inflammation and prevent the formation of fibrous membranes. In cases where posterior synechiae or fibrous membranes develop, surgical intervention, such as synechiolysis or membranectomy, may be required to restore a clear visual axis. Additionally, meticulous surgical technique, including thorough cortical cleanup and gentle tissue handling, is crucial in reducing the risk of postoperative inflammatory complications. Adequate anterior vitrectomy during surgery has been shown to reduce the risk of visual axis opacification, minimizing the long-term impact of inflammatory complications. Regular follow-up is essential to monitor and manage any recurrent inflammation, which can lead to long-term complications such as glaucoma or visual axis opacification.[4]

Postoperative infections, though rare, can cause severe complications like endophthalmitis, resulting in significant vision loss. Prevention involves prophylactic antibiotics and maintaining sterile surgical conditions. Early identification of symptoms such as pain, redness, and reduced vision is critical. Suspected infections require immediate intravitreal antibiotics, like Vancomycin and Ceftazidime, and culture samples to identify the pathogen. Severe cases may necessitate surgical intervention, such as vitrectomy. Close follow-up is essential to monitor infection resolution and adjust treatment based on culture findings and clinical response.[5]

Postoperative glaucoma remains one of the most serious complications of congenital cataract surgery, with both early-onset angle-closure and late-onset open-angle forms. Several factors, including intraocular lens (IOL) implantation, young age, cataract type, corneal diameter, central corneal thickness (CCT), and persistent fetal vasculature (PFV), may be linked to the development of childhood glaucoma following cataract surgery.[5] However, these associations remain debated, and the primary risk factors for postoperative glaucoma are yet to be definitively identified. Preventive measures for postoperative glaucoma include performing a peripheral iridectomy during cataract surgery to prevent pupillary block, meticulous removal of cortical remnants, and the use of IOLs to minimize the risk of aphakic glaucoma.[6] Children who undergo cataract surgery are commonly prescribed topical corticosteroids, which increases the risk of steroid-induced ocular hypertension. Nonetheless, the

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relationship between this steroid-induced pressure elevation and the occurrence of late-onset open-angle glaucoma is still not well understood.

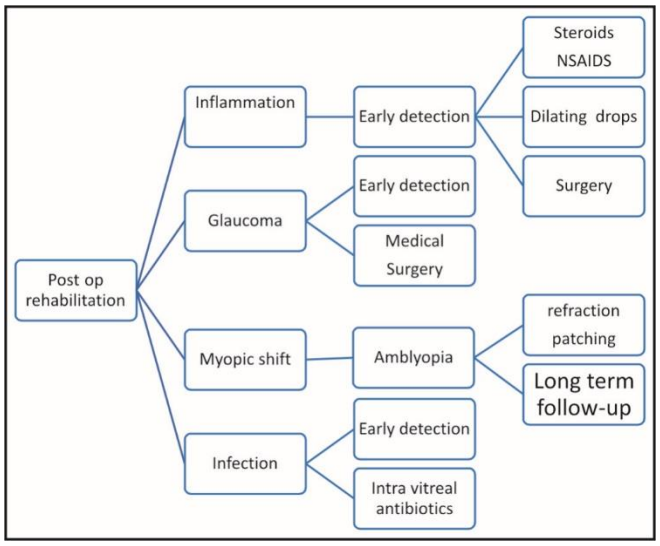
Early detection through regular intraocular pressure (IOP) monitoring and gonioscopy is essential in managing postoperative glaucoma. Medical management, if fails to control elevated IOP, surgical interventions like trabeculectomy or the use of glaucoma drainage devices may be considered. Laser peripheral iridotomy may be performed to relieve pupillary block, especially in cases of angle-closure glaucoma. Long-term follow-up is essential to monitor for the onset of late glaucoma.[7]

One of the most significant concerns in pediatric cataract surgery is the risk of a postoperative myopic shift, particularly in younger children. This trend is observed in both aphakic and pseudophakic eyes, driven by factors such as increased axial length and effective lens power due to eye elongation.[8] Although corneal flattening typically compensates for axial elongation, its slower rate of change is insufficient to counteract the myopic shift. Pseudophakic eyes exhibited a slower rate of refractive growth compared to aphakic eyes, suggesting that IOLs impact eye growth. Despite this slower refractive growth, pseudophakic eyes showed a greater mean myopic shift due to the optical effects of the IOL on the developing eye, particularly with higher IOL powers. The extent of this shift is inversely correlated with the age at surgery, with children younger than two years demonstrating the most rapid progression due to the eye's accelerated growth during this period.[9] However, despite significant shifts, early intervention, especially in children under two years, results in acceptable best-corrected visual acuity (BCVA) at follow-up. Postoperative myopia progression can be managed through planned under-correction during surgery and regular refractive assessments to ensure timely correction with glasses or contact lenses. While refractive surgery is typically postponed until the eye stops growing, it may be considered for older children with high myopia.

Amblyopia is a significant concern following congenital cataract surgery, arising from sensory deprivation due to the cataract, refractive errors, or postoperative complications such as strabismus or posterior capsular opacification (PCO).[10] The earlier the cataract is removed, the better the chances of preventing amblyopia. Post-surgery amblyopia management is essential for optimal visual outcomes. Initial steps include refractive correction using contact lenses for younger children or intraocular lenses (IOLs) for older children, depending on anatomical factors. Regular updates to prescriptions, including glasses for astigmatism or hyperopia, ensure proper visual input. Occlusion therapy, such as patching the stronger eye, remains a key component of amblyopia treatment. Patching stimulates the amblyopic eye and the visual cortex during the critical neuroplasticity period. Treatment intensity varies by amblyopia severity, with schedules ranging from part-time to full-time. Atropine penalization is an alternative for children with poor patching adherence. Regular follow-ups are crucial to monitor visual acuity, compliance, and response, allowing adjustments to treatment. Addressing strabismus or posterior capsular opacification (PCO) is also important to prevent sensory deprivation. Family involvement is critical; educating parents about adherence to patching regimens and follow-ups ensures better outcomes. Family support significantly improves compliance, preventing long-term amblyopia and enhancing vision rehabilitation.

Long-term follow-up is crucial for managing pediatric patients after congenital cataract surgery due to ongoing ocular and visual development. Risks such as myopic shift, glaucoma, amblyopia, and posterior capsular opacification (PCO) require consistent monitoring. Regular appointments help detect complications early and adjust treatments, such as refractive corrections for myopic shifts, amblyopia therapy, or managing PCO with Nd:YAG laser capsulotomy or surgery. In glaucoma cases, routine intraocular pressure checks, visual field tests, and optic nerve imaging are vital to prevent irreversible damage. Extended monitoring ensures optimal outcomes and minimizes long-term complications.

The success of postoperative care for congenital cataracts heavily depends on active family involvement. Parents and caregivers are essential for ensuring adherence to medications, patching regimens, and follow-up appointments. Administering topical steroids and antibiotics post-surgery prevents complications, while consistent patching improves visual outcomes. Families must also recognize signs of complications like redness, swelling, or vision decline and report them promptly. In low- and middle-income countries, family education and support are critical due to limited access to care. Mobile health interventions, such as medication reminders, can further assist families in maintaining adherence and improving outcomes.



Postoperative management of congenital cataracts in children involves addressing challenges like myopic shift, inflammation, glaucoma, amblyopia, infection, and the need for prolonged follow-up. A multidisciplinary approach is essential, including early surgery, individualized refractive correction, strict inflammation and infection control, and consistent monitoring for complications. Active family involvement is vital for treatment adherence, early complication detection, and regular follow-ups. Tailored strategies and strong family engagement help optimize long-term visual outcomes and enhance the quality of life for affected children.

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