Editorial

New frontiers in pediatric cataract surgery

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Abbreviations: IOL, intraocular lens; CCC, continuous curvilinear capsulorhexis; PCO, posterior capsular opacification; VAO, visual axis obscuration

Editorial

Childhood blindness remains a major cause of childhood blindness world over. In developing countries such as India a large number of children (more than 20%) are visually impaired.[1,2] The actual number of children suffering from childhood cataract may be much larger since many cases may go unreported.[1–3] Therefore, it is prudent to identify and address various issues related to the diagnosis and management of pediatric cataract. In the past few decades, a number of advances have revolutionized the field of pediatric cataract surgery. Progress in this field has significantly improved the outcomes of such patients even in developing countries such as India.

Despite rapid progress in the field of diagnostics and laboratory science, the exact etiopathogenesis of infantile/developmental cataract have not been elucidated yet in literature.[3,4] Novel tools such as next-generation DNA sequencing have been introduced to identify various genetic loci responsible for lenticular opacity in young children.[5] It is also vital to rule out congenital or perinatal infectious causes such as TORCH that may be associated with cataract.[3] Childhood cataract may also be associated with a number of other etiologies such as metabolic and acquired causes such as trauma.[6,7] Cataract related to etiologies such as spherophakia and lenticonus may prove to be diagnostic as well as management challenges.[8]

Children with congenital cataract require a thorough clinical examination to rule out associated ocular as well as systemic pathologies. Often congenital cataract may be associated with corneal opacities or glaucoma. Glaucoma associated with cataract may be primary, or acquired as a result of surgical interventions for pediatric cataract.[4] Such cases may be very difficult to diagnose and manage and require specialized case in tertiary care centers with an experienced pediatric ophthalmology team. Measurement of intraocular pressure and fundus examination must be routinely carried out in children to rule out presence of comorbidities. Trained pediatricians and geneticists may help in a thorough systemic workup of such patients, which is may be important to detect life-threatening conditions such as metabolic anomalies.

Technological advances have greatly enhanced the outcomes among patients suffering from ocular disorders. However, the task of managing childhood cataract remains difficult.[3] Currently, the most preferred technique of pediatric cataract surgery is phaco aspiration with posterior chamber intraocular lens (IOL) implantation.[3,9–12] The goal of surgery is to ensure clear visual axis and placement of the IOL in the capsular bag to avoid iris and corneal complications. An important requisite is to select the material and type of the IOL prior to surgery. The most commonly used IOL for both adult and pediatric cataract surgery in the present day is hydrophobic acrylic (foldable, single-piece IOL).[13,14] Nowadays, recent advances in IOL design such as toric and multifocal IOLs have further improved the outcomes among children with cataract and refractive errors. There are various guidelines and formulae available that guide the selection of appropriate IOL power.[15,16] The aim of the surgery must be to achieve emmetropia to foster adequate development of vision during the critical stage of brain growth.

There are a number of differences in the technique of pediatric cataract surgery compared to adult cataract surgery. Highly skilled surgeon and adequately experienced operation theatre staff are necessary to ensure gratifying outcomes in pediatric cataract surgery. Due to differences in the anatomy and presence of factors such as high vitreous pressure, general anesthesia and more elastic lens capsule, phaco aspiration systems with better fluidics and control system such as the Alcon Infiniti System (Alcon Labs, Fort Worth, TX, USA) are preferable, though not necessary. The authors prefer the technique of continuous curvilinear capsulorhexis (CCC) followed by cortical aspiration.[10] In young children aged 1 month to 6 years, primary posterior capsulotomy with limited anterior vitrectomy may be performed to minimize the risk of posterior capsular opacification (PCO).[17] Anterior vitrectomy is often performed with assisted techniques.

In order to control surgical inflammation, high dose steroids may be required to prevent postoperative complications. Patients with uveitic cataract and trauma may benefit from intraocular depot steroids like dexamethasone implants (Ozurdex®).[18] Amblyopia prevention and treatment requires strict adherence and emphasis. Thus, a close follow-up is essential in the immediate postoperative period to assess the refractive status and binocularity. It is common for visual axis obscuration (VAO) to develop in children as pediatric eyes may be predisposed to higher levels of inflammation compared to adults.[19] Such sequelae may require further interventions so that issues like IOL tilt and/or decentration can be corrected.

Conclusion

The field of pediatric cataract management is ever evolving, and the outcomes are further improving. There have been numerous advances in various areas including surgical instrumentation, phaco aspiration devices, materials and design of IOLs and development of more potent anti-inflammatory drugs. Recently, femtosecond

laser assisted pediatric cataract surgery has also been introduced.[20] Thus, benchmarks for postoperative outcomes after pediatric cataract surgery have risen. Present day management of pediatric cataract has evolved and consists of an integrated approach and long-term follow-up to ensure wholesome development of the child.

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Conflicts of interest

No conflicts to declare.

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