Pediatric cataract surgery practices in the COVID-19 era: Perspectives of a tertiary care institute in Northern India

Parul Chawla Gupta, Jaspreet Sukhija, Surbhi Khurana, Savleen Kaur, Shagun Korla, Abinaya Valliappan, Jagat Ram

Purpose: To discuss the impact of COVID-19 pandemic on the pediatric cataract surgery services in a tertiary care institute in India, as well as the protocol followed for these surgeries. Methods: COVID-19 has hampered outpatient and elective services and surgeries throughout the world. During the national lockdown imposed in March in India, outpatient services were suspended in our institute, leading to a tremendous backlog of pediatric patients with cataract. Since the delay in surgery in pediatric cataract can cause amblyopia, our institute had resumed pediatric cataract surgeries in June 2020 at the time of Unlock-1 in the country. Results: We have discussed the percentage of reduction in pediatric cataract surgeries in 2020 during the Unlock 1, 2, 3, and 4, as compared to the number of surgeries done by the pediatric ophthalmology unit in the same months last year. We had introduced triage and telemedicine in our department. We have discussed the preoperative, intraoperative, and postoperative protocol followed in our institute for children with pediatric cataract, and also the measures which can be taken for the safety of patients and staff. Conclusion: It is essential to ensure COVID-19 protocol, i.e., wearing a mask, social distancing, and frequent hand hygiene, among the patients and health care personnel. Redesigning pediatric cataract surgery practices is essential to ensure the safety of the health care workers and the patients.

Key words: Challenges in pediatric cataract, pediatric cataract in COVID-19, COVID-19 protocol for pediatric cataract

The global prevalence of congenital cataract is estimated between 2.2/10,000 and 13.6/10,000.[1,2] The World Health Organization declared Coronavirus Disease (COVID-19) as a Public Health Emergency Of International Concern on 30 January 2020.[3] At the time of lockdown due to COVID-19 in India, outpatient services of tertiary institutes of the country had been suspended. This had resulted in a tremendous backlog of adult and pediatric patients with cataract. Pediatric cataract surgery is not an elective procedure, and its resumption post the nationwide lockdown is irrefutable. Since the delay in surgery in pediatric cataract can cause amblyopia, our institute had resumed pediatric cataract surgeries in June 2020 at the time of Unlock-1 in the country. It is important that pediatric cataract surgeons employ a realistic approach to maintain ophthalmic care in these coronavirus times. Basic changes in our practice patterns and following simple guidelines are imperative to protect ourselves and our staff against the transmission of coronavirus, and at the same time protecting our pediatric patients from developing amblyopia and a lifetime of disability. We discuss the tremendous impact of COVID-19 pandemic on the pediatric cataract surgery services in our tertiary care institute, the delay caused in the surgeries of these children, as well as the protocol followed by us for these surgeries.

Cataract Surgeries During "Unlock 1-4" from June to September 2020

Outpatient services of our tertiary care institute were suspended, when the lockdown was announced in the country. In a busy multisurgeon pediatric cataract surgery practice of different pediatric cataract surgeons (J.R., J.S., P.C.G.), no pediatric cataract surgery was done during the “lockdown” period from 22 March till 31 May 2020. Though the outpatient services remained suspended during Unlock 1 as well, we had resumed pediatric cataract surgeries, both phacoaspiration with or without intraocular lens (IOL) implantation, examinations under anesthesia, and miscellaneous procedures like membranectomy, secondary IOL, etc., from June 2020 (Unlock 1), so as to prevent stimulus deprivation amblyopia in children owing to cataract, or posterior capsular opacification in pseudophakic eyes. Children with traumatic cataract were also scheduled for surgery if required. A total of 7 pediatric cataract/posterior capsular opacification surgeries were done (2 traumatic cataracts, 4 congenital cataracts, and 1 membranectomy) in “Unlock 1” period in June 2020. In “Unlock 2” period in July 2020, 27 such surgeries were carried out (5 traumatic cataracts, 1 cataract associated with persistent fetal vasculature, 3 developmental cataracts, 16 congenital cataracts, 1 membranectomy, and 1 secondary IOL implantation). A total of 18 procedures were done in “Unlock 3” during August 2020 (4 traumatic cataracts, 2 developmental cataracts, 9 congenital cataracts, 1 uveitic cataract, 1 IOL dialling, and 1 IOL polishing). In September 2020, which was “Unlock 4,” 16 pediatric cataract...
surgeries were done (2 traumatic cataracts, 4 developmental cataracts, and 10 congenital cataracts). A total of 54 pediatric cataract surgeries, 66 IOL diallings, and 65 membranectomies were done during July, August, and September 2019. Our census showed a significant reduction of pediatric procedures in our center in 2020 as compared to 2019, i.e., 50%, 27.2%, and 24% reduction was seen in surgeries during July, August, and September 2020 as compared to 2019.

**Role of Telemedicine/Teleophthalmology**

Telemedicine has numerous advantages, like giving prompt advice and interacting with the patient when it is difficult to do so. The diagnosis of a condition that can be treated should never be delayed, especially during the present times and in case of a future surge in cases. A key feature of teleophthalmology was the ability to transfer interpretable images and videos for diagnosis.[9]

Telemedicine in our institute was used to give appointments to new as well as returning patients who complained of having children showing unilateral or bilateral white reflex (leukocoria/absence of red reflex) in their one or both eyes. Appointments were considered urgent when vision was at risk, especially due to amblyopia in a young child. All patients under 8 years of age who had visually significant cataract or visual axis obstruction due to membranes or pigments over the intraocular lens were given an appointment to be examined on the slit lamp. Examination under anesthesia was planned for infants and toddlers who were uncooperative for slit-lamp biomicroscopic evaluation.

Telemedicine was also used to follow up patients who underwent cataract surgery by using it as a stop-gap arrangement to decrease the number of follow-up visits.

**Delay in Surgeries**

We saw a tremendous decrease in the number of pediatric surgeries seen in our institute this year, as compared to the last year. It was because most of the people could not come to our tertiary care institute due to restriction on public travel and curfews. Many people did not come as the outpatient services were closed. Tremendous disruption in the finances of the parents also caused delay from their side to come for treatment. We saw many children with bilateral cataract who underwent cataract surgery in one eye before the lockdown but could not come for cataract surgery of the other eye until later phases of unlock, causing exacerbation of the amblyopia in the non-operated eye.

**Preoperative Counseling and Testing**

Though children having COVID-19 generally are less commonly affected and have mild symptoms, 15–35% can even be asymptomatic.[10] Hence, it becomes imperative to screen all children who visit for examination for coronavirus infection.

Slit-lamp examination of children was done, only after ensuring proper coverage of mouth and nose of the patients, attendant, and doctor with surgical 3-ply or N95 mask [Fig. 2]. All the slit-lamps and ophthalmic instruments were sanitized after every patient. Non-urgent elective surgeries were suspended to decrease the risk of viral disease transmission. The children were tested for the coronavirus by taking nasopharyngeal swabs prior to the day of surgery and then admitted to the isolation ward of the Ophthalmology Center [Fig. 3]. Reverse-transcriptase polymerase chain reaction (RT-PCR) for Covid-19 was done in all the patients; rapid-antigen testing was not recommended in view of the high false negativity of the test. We considered RT-PCR to be valid only for 48 h after taking the sample, as the patient might be in the incubation period at that time. If due to any reason, the child could not be operated upon in the stipulated 48 h, the RT-PCR test was repeated. RT-PCR was done for all our pediatric patients free of cost. Parents of the children were counseled about the need of doing both eye surgeries (in case of bilateral cataracts) within 3–4 days of each other to discharge the child in the shortest possible time and to decrease the exposure of the child and the parents by repeated travelling. In addition, difficulty in public transport posed a challenge for economically weaker sections, and hence they were kept admitted. The general ward...
of our institute was divided into two sections: one section as isolation ward where the patients were admitted initially when their RT-PCR sample was sent, and patients were shifted to the second section when they were reported to be negative for COVID-19. In the first section, isolation of the patients was ensured by the admission of the patients on alternate beds. Social distancing, hygiene, and wearing of masks were ensured at all times for all the patients and their attendants. If any child was reported positive, the details were informed to the district health authorities, and the child and his/her family, if asymptomatic, were advised home isolation after an undertaking and given a reappointment after 2–3 weeks. They were asked to come only when their repeat RT-PCR for COVID-19 was negative.

### Intraoperative Considerations

Only one parent/guardian was allowed to accompany the child inside the preoperative waiting area. The bed linen was changed, and the tables in the waiting area, as well as the recovery area, were sanitized after every patient. The child and the parents were instructed to wear disposable 3-ply surgical masks, caps, and linen washable gowns. The anesthesia team, wearing N95 masks, caps, plastic face shield, and gloves, took the child under general anesthesia as endotracheal intubation is aerosol-generating.[9,10] The surgeons operated using an N95 mask and plastic goggles [Fig. 4a and b]. Minimum staff was allowed inside the operating room. The surgical teams were divided into small weekly rotating groups, and the health care workers were continuously monitored for symptoms of COVID-19.[11] If any health care professional developed any symptom, he/she was advised testing as soon as possible, along with isolation for 14 days. The surgical technique remained the same except for the fact that an additional preservative-free intracameral moxifloxacin antibiotic was given at the end of the surgery to safeguard against any infectious complication (endophthalmitis) which might require another surgery. Positive vitreous pressure is always a challenge in pediatric cataract surgery and requires proper tamponade by high viscosity cohesives during the surgery.[12] Since the economy suffered during the lockdown, we ensured free surgeries and provided free intraocular lens and other surgical materials to the children of economically weaker sections.

### Anesthetic Considerations

Our anesthetists remained extra careful and followed COVID guidelines strictly, as they were at high risk of exposure while intubation of the children. Gloves, N-95 masks, and face shields were worn by them during the induction of the children.
Postoperative Refraction and Amblyopia Management

The Web-based refraction apps on pediatric patients were avoided as they are unreliable at this time due to the lack of calibration and validation issues. Refraction of the children and initiation of amblyopia management were done before discharge to avoid repeated travel of the patients. Patients were also given an option of getting the refraction and/or slit-lamp evaluation done locally at their native place if they were to face difficulty in transport and also to avoid the risk of acquiring the coronavirus infection en route. Amblyopia management was done by offering part-time occlusion to the patients and checking their compliance over teleconsults.

Conclusion

There has been a large-scale disruption of healthcare during the COVID-19 pandemic. Although most hospitals have restarted pediatric cataract surgery, the ramp-up is restricted due to safety and operational concerns. We saw a tremendous decrease in the number of pediatric cataract surgeries. Bilateral same-day cataract surgery can be promoted in children with bilateral congenital or developmental cataract. It is essential to ensure COVID-19 protocol, i.e., wearing a mask, social distancing, and frequent hand hygiene, among the patients and health care personnel. Redesigning pediatric cataract surgery practices is essential to ensure the safety of the health care workers and the patients.

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Conflicts of interest

There are no conflicts of interest.

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Commentary: Pediatric cataract management during the COVID-19 era

Blindness in children remains a cause of great concern globally despite large advances in the field of ophthalmology in the past few decades. Pediatric cataract blindness presents an enormous problem to developing countries in terms of human morbidity, economic loss, and social burden. With over 1.4 million children blind throughout the world, low vision that can significantly hinder activities of daily living is present in over 17.5 million. Cataract forms a large share of the preventable blindness with the World Health Organization (WHO) estimates ranging above 200,000 cases world over. Developing countries like India and China form the epicenter of the problem with more than 20% of their population visually impaired. Economic burden and years of productive life lost due to untreated pediatric cataract clearly favor urgent attention to this challenge. To assure the best long term outcome for cataract blind children, appropriate pediatric surgical techniques need to be defined and adopted by ophthalmic surgeons of developing countries.

Managing cataracts in children remains a challenge. Treatment is often difficult, tedious, and requires dedicated team effort. Cataract surgery infants and children are usually different from adults due to several challenges. These include need for examination under anesthesia (EUA), difficulty in calculation of correct intraocular lens (IOL) power due to unavailability of instruments (such as handheld keratometer), change in axial length, need for primary posterior capsulectomy (with or without anterior vitrectomy) to provide a clear visual axis, long term follow-up for refraction, intraocular pressure monitoring, evaluation of opacification of visual axis, and ambylopia management. Several ophthalmologists refer infantile/pediatric cataracts cases to institutional set-up leading to increase work load, delay in planned surgery, and subsequent visual rehabilitation in these cases.

Management of infantile/pediatric cataract during the COVID-19 era poses additional challenges. Lenticular opacity in one or both eyes can be missed by parents/family members; thus, most of these children present late for treatment leading to the possibility of sub-optimal visual gain after surgery due to irreversible deprivation ambylopia. With the COVID-19 crisis upon us, we must rethink various innovative ways to facilitate pediatric cataract management.