

Resuming Elective Paediatric Surgical Procedures in the Era of COVID-19

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Abstract

Background: The novel coronavirus and the disease it causes COVID-19, like other viral outbreaks, have an unpredictable timeline. Therefore, a triumph in the battle against COVID-19 could only be achieved if a health care system's capacity to support a potentially overwhelming increase in critical patient care needs is maintained, and the viral curve is flattened. Accordingly, health care bodies around the globe called upon prioritising appropriate resource allocation as it relates to elective invasive procedures and minimising the use of essential items required to care for patients. The unpredictability COVID-19 timeline in the absence of effective drug treatments and vaccination along with the restrictive health care policies implemented suggest that patients may be deprived of access to needed surgical care, likely for many months. However, the potential undue delay in delivering essential elective surgical care may have a more detrimental impact on patients' health compared to that of COVID-19 itself. This particularly applies to the paediatric population in which infection rates have been demonstrated to be considerably lower and mortalities have not been reported yet. Therefore, the need emerges for actions to be taken that allow for the resumption of essential elective surgical procedures in this population of patients. **Materials and Methods:** A comprehensive search through surgical guidance and recommendations to develop a set of evidence based recommendations that allow for the safe and timely delivery of essential paediatric surgical care during the time of COVID-19. **Conclusion:** No compelling evidence that the paediatric population is at an increased risk of morbidity or mortality exists. Therefore, delaying essential paediatric surgical care cannot be justified as it may have a potentially negative health impact, and continuous refinements of surgical recommendations are encouraged in view of evolving circumstances.

Keywords: COVID-19, elective surgery, pandemic, paediatric surgery, severe acute respiratory syndrome-CoV-2

INTRODUCTION

Pandemics have devastated human history even before biblical times, with the most fatal pandemic being the bubonic plague (Black Death), which killed an estimated 75–200 million people in the 14th century.^[1] The influenza pandemic of 1918 (Spanish Flu) was the most devastating viral pandemic in recent history. It infected approximately 500 million people (about one third of the world's population) and killed over 50 million people.^[2] The novel coronavirus and the disease it causes (COVID-19), as named by the World Health Organisation (WHO), was quickly compared to the Spanish Flu, and anticipation of a similar severity was drawn.^[3] This concern was reasonable due to preliminary data which showed a rapid viral transmission rate and a higher mortality rate compared to seasonal influenza-like illnesses. Closing teaching institutions,

restricting travel and limiting medical care were done to contain the spread and limit losses.^[4] Interventions were limited to emergency cases, and health-care bodies urged practicing thoughtful considerations regarding interventional procedures. In the beginning, fear of an overwhelming pandemic that would exhaust resources and potentially spread among health-care providers rationalised these actions. Furthermore, the scarcity of data was a handicap that would improve with the play-out of the timeline of COVID-19. Developing information has helped us better understand the severity of COVID-19. COVID-19 overall mortality rate is considered higher than that of seasonal flu.^[5] Although the disease affects all age categories, children

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present with a milder form of the disease, and no deaths have been reported among children.^[6]

Using ‘a one size fits all’ recommendation may prove to be harmful at this point. Robertson *et al.* reported an early estimate of the indirect effect of COVID-19 on maternal and child health in low- and middle-income countries (LMICs).^[7] They demonstrated that child and maternal mortality could considerably increase because of the disruption in routine health care and access to food.^[7] Chang *et al.* reported a significant reduction in ambulatory, inpatient, and dental care during the peak of the severe acute respiratory syndrome (SARS) epidemic due to fear of the implications of viral spread.^[8] Bakkar *et al.* highlighted the considerable additional financial and psychological implications imposed by COVID-19 on cancer management plans, even in areas of low prevalence.^[9]

Elective (non-essential) surgical procedures should be thoughtfully considered in accordance with the surge expected from the pandemic spread; however, specific regions who already suffer from a heavy burden of surgical disease, such as Africa, should have special considerations.^[10] Twenty-eight million surgical operations are estimated to be cancelled and LMICs such as Africa will be hardest hit.^[11] These areas where health care is already scarce, and the medical services are already pushed to the limit, a quick recovery will undeniably be impossible.^[11] The already impaired referral chain along with the imposed restrictions on mobility and decrease in incomes, related to COVID-19, will cumulatively delay seeking health care and surgical services. This shift to non-operative management will likely increase the complications related to surgical cases and prolong hospital stay also, which in turn may increase the chance of nosocomial transmissions.^[12-14]

Elective paediatric surgical and medical care has been curbed in concordance with guidance from surgical associations and health-care officials.^[15] However, the potential outcome of delay in necessary elective surgical procedures may have a more detrimental impact on patients’ health compared to that of COVID-19 itself. When prioritising surgical cases, these fall along a continuum and are stratified according to indication and degree of urgency bearing in mind that many elective surgical procedures could upgrade in terms of priority at any time and become urgent or emergent.^[16]

The uncertainties around COVID-19 timeline and the potential impact of the pandemic have rationalised current mitigations and guidance regarding surgical interventions, but emerging data and the potential negative implications of delaying surgical care urge us to re-strategies accordingly. The purpose of our study is to provide guidance for the safe and timely resumption of elective surgical paediatric care.

RESUMING ELECTIVE PAEDIATRIC SURGICAL CARE

While potentially overwhelming the infrastructure of health-care facilities is a major concern, re-establishing elective surgical care is equally important. Resuming surgical

care for hundreds of millions of patients worldwide may reasonably face strong objections. Nevertheless, denying it without significant evidence may have serious repercussions. The current available literature on COVID-19 supports that children suffer from a milder form of the disease and lacks any reports on adverse outcomes related to paediatric surgical interventions.^[6] Therefore, there is no current evidence to support further delay of essential paediatric surgical care.

Accordingly, a well-balanced and comprehensive strategy to resume elective paediatric surgical procedures can be assembled utilising the following recommendations:^[17]

Isolating pediatric surgical centers

Paediatric surgical interventions should be performed in centres that do not treat COVID-19 patients. Furthermore, select centres should be dedicated to the treatment of COVID-19 patients.^[17] In regions where the number of patients requiring hospitalisation exceeds available resources, performing elective procedures should be weighed against the possible adverse implications of a potential delay. A minimal number of visitors and chaperones should be allowed at any time. A clean and untainted hospital environment is necessary for resuming elective surgical procedures. Furthermore, utilising a COVID-19 specific surgical safety checklist will also assure the execution of set recommendations.

Utilising personal protective equipment

Interventions should be performed assuming that all patients and chaperones are infected. Personal protective equipment (PPE) should be utilised by hospital staff, patients, and any accompanying persons. Practicing maximum safety measurements will reduce the likelihood of viral transmission. It will also assure the safety of patients and the health-care providers. Operating room staff should wear surgical face masks and eye coverings (droplet precautions) for standard operative cases and wear N95 masks, eye protection, gloves and gowns for aerosol-producing procedures.^[18]

Screening paediatric surgical patients

Implementing a comprehensive screening protocol is essential for a safe surgical practice and is necessary for protecting patients and health-care personnel. The ASA and the APSF have published a joint statement on non-urgent care during the COVID-19 outbreak.^[19] Their recommendations were in concordance to the CDC COVID-19 health-care facility guidance.^[20] The joint statement advised identifying the prevalence of COVID-19 in populations before the implementation of any peri-operative testing protocol.

Al-Omar *et al.* proposed a modified screening protocol for surgical intervention based on regional prevalence.^[17] The prevalence was classified as either high or low based on calculations of previous seasons of flu-like illnesses.^[21] In regions with no or low COVID-19 prevalence (low priority for testing), patients should be screened for symptoms. Patients reporting flu-like symptoms should be referred for nucleic acid amplification. Their procedures should be postponed

Table 1: Pediatric surgical procedures stratified based on urgency

Indication	Urgency	Example
Emergent	Delay is life threatening	Intestinal obstruction
		Complicated hernia
		Extracorporeal Life Support
		Intestinal perforation
		Trauma surgery
		Testicular/ovarian torsion
		Acute appendicitis
		Foreign Bodies
		Cancer surgery
		Congenital GI anomalies
Urgent	Delays of days to weeks may be detrimental	Biliary Atresia
		Vascular access device
		Inflammatory bowel disease
		Cholecystectomy
		Abscess drainage
		Elective
Asymptomatic inguinal hernia		
Elective bowel reconstruction		
Choledochal cyst		
Branchial cleft cyst/sinus excision		
Thyroglossal duct cyst excision		
GERD surgery		
Orchiopexy		
Elective splenectomy		

according to test results and/or clinical status. Regions with a high prevalence rate (high priority for testing) are urged to screen for symptoms and perform nucleic acid amplification testing for patients and chaperones.^[17]

The CDC COVID-19 health-care facility guidance recommends discontinuing transmission-based precautions in symptomatic patients based on either a test-based or a symptom-based strategy. While adopting a test-based or a time-based strategy for asymptomatic patients.^[18]

Prioritising surgical cases

Prioritising surgical cases according to urgency are necessary to minimise the utilisation of potentially scarce resources. Most paediatric surgical procedures are time-sensitive and cannot be delayed indefinitely. Table 1 summarises common paediatric surgical procedures according to urgency (structured according to the American College of Surgeons guidance).^[15] This may help facilities formulating management protocols for paediatric surgical cases. Health-care providers are left with the responsibility of prioritising the urgency of procedures and scheduling them accordingly. An additional consideration is to prioritise cases according to surgical complexity. Priority can be given to day case surgery cases. Centres can isolate same day surgical facilities where patients can be admitted and discharged with no need to interact with ward patients. A large proportion of paediatric surgical cases are inguino-scrotal conditions and urogenital procedures that do not need complex

interventions and can be discharged following the procedure with proper counselling.^[22]

CONCLUSION

No compelling evidence that the paediatric population is at an increased risk of morbidity or mortality exists. Therefore, delaying essential paediatric surgical care cannot be justified as it may have a potentially negative health impact, and continuous refinements of surgical recommendations are encouraged in view of evolving circumstances.

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Conflicts of interest

There are no conflicts of interest.

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