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Maternal-fetal surgery during the coronavirus disease 2019 pandemic



Timothy M. Crombleholme, MD; Kenneth J. Moise Jr, MD

On March 13, 2020, in response to the global coronavirus disease 2019 (COVID-19) pandemic sweeping the country and threatening to overwhelm our healthcare systems, the American College of Surgeons and the US Centers for Disease Control and Prevention recommended a postponement of nonemergent surgical procedures.¹ The American College of Obstetricians and Gynecologists (ACOG) joined multiple other societies in women's health to support the American College of Surgeons' position on elective surgeries.² ACOG went on to state, "Surgical procedures by obstetrician-gynecologists are generally medically indicated procedures necessary for the furtherance of patient health and safety." Unfortunately, maternal-fetal surgical procedures in a number of instances have been lumped together with elective procedures and several fetal surgery centers have been entirely closed down during the COVID-19 pandemic.

Maternal-fetal surgical procedures are undertaken for life-threatening or life-altering fetal conditions. A delay in therapy could result in fetal loss to the underlying condition or could commit the baby to postnatal treatment which may have suboptimal long-term outcomes. To treat a disorder, the diagnosis must be made in a timely fashion. Of the various indications for maternal-fetal therapy, the most dynamic and time sensitive is arguably twin-to-twin transfusion syndrome (TTTS). As noted in the Society for Maternal-Fetal Medicine (SMFM) Clinical Guideline, "the lack of a predictable natural history, and therefore the uncertain prognosis for TTTS, poses a significant challenge to the clinician caring for

monochorionic diamniotic twins."³ As such, SMFM and other international organizations recommend serial ultrasonography every 2 weeks starting at 16 weeks' gestation to delivery. Nonetheless, recent recommendations have been proposed to decrease the frequency of ultrasound examinations in pregnancy to limit the exposure of the health force and other patients to COVID-19 infection.⁴ In particular, these authors have recommended a decrease in the frequency of ultrasonography in monochorionic twins to every 4 weeks in lieu of the usual 2-week interval.

Most indications for fetal intervention should not fall under the prohibitions of the elective procedures during the COVID-19 pandemic. We would therefore suggest the following considerations for maternal-fetal therapy during these unique times:

- Fetal centers should consider using telemedicine consultation before patients travel to a distant site for treatment.
- COVID-19 testing capabilities currently vary widely across the country. In an optimal situation, patients and any support person who plans to accompany them should be tested for COVID-19 as proximate to the planned maternal-fetal procedure that will allow sufficient time for the return of the result.
- Surveillance methods such as ultrasound surveillance for twin-to-twin transfusion every 2 weeks should not be altered.
- Magnetic resonance imaging (MRI) units may have restrictions on their use of imaging for patients under investigation (PUD) or COVID-19-positive patients. In this situation, in lieu of MRI, a coronal ultrasound view of the posterior cerebral fossa would be sufficient to document the presence of Chiari II malformation with hind-brain herniation to qualify a fetus for open fetal repair of spina bifida.
- Surgical procedures for life-threatening fetal conditions should be offered to the pregnant patient who is a PUD or who has a positive result for COVID-19 as long as the patient remains asymptomatic or has minimal symptoms and the procedure can be performed under local or regional anesthesia. Such procedures include intrauterine transfusion, laser therapy for advanced TTTS, selective reduction such as in cases of twin reversed arterial perfusion sequence, and fetal shunt placement.
- In the case of a symptomatic COVID-19-positive patient, surgical procedures for life-threatening fetal conditions should be delayed until the patient has completely recovered and exhibits a return to normal respiratory function.

From the Fetal Care Center Dallas, Medical City Dallas Children's Hospital, Dallas, TX (Dr Crombleholme); Department of Obstetrics, Gynecology, and Reproductive Sciences, McGovern Medical School at UTHealth and the Fetal Center, Children's Memorial Hermann Hospital, Houston, TX (Dr Moise); and Fetal Think Tank Consortium (Drs Crombleholme and Moise).

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Corresponding author: Kenneth J. Moise, Jr, MD. Kenneth.J.Moise@uth.tmc.edu

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- Open fetal surgical repair for spina bifida involves intubation and aerosolized respiratory secretions putting the entire healthcare team at risk with a prolonged interval of intubation during surgery. In addition, the use of multiple tocolytics such as indomethacin after the procedure is associated with an increased risk for pulmonary edema. In some situations antenatal steroids may be administered before the procedure in the event that a preterm delivery occurs. Initial concerns for the use of nonsteroidal anti-inflammatory drugs and steroids in patients with COVID-19 have not been substantiated with further experience in these patients.⁵ Maternal safety should however take precedent when considering a fetal repair of spina bifida because the postnatal repair of this condition is available. For these reasons, we would suggest that a COVID-19–positive pregnant patient who is symptomatic be excluded from maternal-fetal intervention. In the case of a PUD or asymptomatic COVID-19–positive patient, surgery should be delayed for a minimum of 14 days. In this latter circumstance, undertaking the procedure before 26 weeks' gestation (criteria used in the Management of Myelomeningocele Study trial) may not be possible. Extending the gestational age window to 29 weeks' gestation that has been reported in other fetal repair series could be considered after review by a local ethics committee.⁶
- In fetal cases that might be candidates for an ex utero intrapartum treatment (EXIT) procedure (such as cervical teratoma or lymphangioma), the procedure requires intubation with the use of halogenated agents for uterine relaxation. After extensive counseling, an EXIT procedure could be offered to a PUD or asymptomatic COVID-19–positive patient. In a symptomatic COVID-19–positive patient, a better alternative to an EXIT procedure would be to plan for cesarean delivery under regional

anesthesia with an airway team available in the operating suite for neonatal resuscitation.

As we have seen in most aspects of the healthcare response to the COVID-19 pandemic, a coordinated, collaborative, national approach to help meet the patient's needs offers the best hope of controlling the spread of the virus while still being able to meet the critical needs of pregnant mothers in need of maternal-fetal intervention. Some fetal centers where the pandemic has escalated have ceased offering maternal-fetal interventions. In these cases, consultation with other fetal centers that continue to offer these procedures owing to available resources should be considered. We suggest these guidelines for consideration by Maternal-Fetal Surgery Centers to achieve the goals of preserving resources to fight COVID-19, protect healthcare providers, and continue to provide lifesaving and life-altering maternal-fetal interventions to the most vulnerable of patients. ■

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