Baby Steps and Giant Leaps for Fetal Surgery

AFTER decades of preparing the theoretical framework of fetal surgery,¹ the reality of it finally hit home in 2011 when Adzick et al. published their National Institutes of Health-supported study on outcomes after in utero surgery for myelomeningocele. Aply named MOMS (Management of Myelomeningocele Study), the investigators terminated enrollment early after demonstrating that children who received in utero repair of myelomeningocele had a decreased incidence of ventriculoperitoneal shunt placement and less mental and motor disability at 30 months of age.² In this issue of Anesthesiology, Ferschl et al.³ detail their early experience anesthetizing pregnant women undergoing in utero myelomeningocele repair. On the surface, it appears to be a review article. But we believe it belongs to a unique genre of scientific communication that provides an introduction to the anesthetic considerations for an emerging new technology. Unlike most review articles, there is little directly relevant anesthetic research data to review as fetal surgery takes its first steps—rigorous investigation in this area does not yet exist.

Ferschl’s description of anesthesia for fetal surgery mirrors similar pioneering articles in our field, such as Vandam’s description of anesthetic considerations for renal transplantation⁴ and early descriptions of anesthesia for liver transplantation,⁵ laparoscopic cholecystectomy,⁶ bariatric surgery,⁷ and transcatheter aortic valve replacement,⁸ to name a few. These publications have introduced us to emerging surgical technologies and heralded new eras marked by rapid evolution of surgical techniques, innovation, outcomes, and protocols. They have the power to stimulate and shape the development of research agendas around the emerging technology. For fetal myelomeningocele repair, examples of this might include the following: what is the most effective way to relax the myometrium during the procedure? Can certain anesthetic drugs or techniques prevent or reduce the risk of preterm labor? Is the fetus anesthetized and free of pain? Does it matter? What is the best comprehensive anesthetic approach that optimizes maternal and fetal well-being? Research into the anesthetic aspects of this highly complex procedure is still in its infancy.⁹,¹⁰

Ferschl et al. describe the anesthetic protocol from their center, which was one of the three that participated in MOMS. Although the protocol they describe is similar to that used at the other two original participating institutions, over time there will be evolution and divergence across centers that venture into this area. The challenges and strategies of successfully transferring this new technology from the trial centers to other medical centers are among the most pressing and difficult issues. Similar to solid organ transplantation and bariatric surgery, fetal surgery requires high levels of interprofessional teamwork, coordination, and longitudinal care to optimize outcomes ...

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ful of program-specific reports has been described as both “groundbreaking and controversial.” These public reports have many audiences including public and private payers, regulators, media, transplant centers, organ recipient candidates (and potential living donors), and are used for a host of purposes, both intended and unintended by the registry. This high level of transparency and the expanding audience have had unintended consequences. Underperformance relative to peer programs, as reflected by poor program-specific outcome results, may have considerable negative consequences for programs. Such threats may cause centers to be more reluctant to accept higher risk patients, or to be more selective about accepting organs. Recently, a consensus conference of stakeholders was held to recommend modifications of reporting to address potential confounding factors related to baseline disease that may contribute to poor outcomes. Recommendations included careful revision of risk measurement and adjustment, changes to help protect and promote innovation, and provision of tools necessary to empower centers to facilitate greater quality assessment and improvement. Lagasse recently emphasized the challenges and importance of accurate measurement of quality and outcomes risk-adjustment, as well as the complex political and financial implications of outcomes registries.

Fetal myelomeningocele repair will not be the last complex, resource-intensive, large-team surgical intervention that will be introduced into the realm of anesthesiology. The speed with which emerging new surgical procedures take hold and spread from the pioneering programs to specialized centers, and then on to “value-added process” models in the community seems to be accelerating. We should consider participating fully in NAFTNet, and its anticipated leadership role to ensure a systematic and collaborative approach to managing the development, implementation, assessment, refinement, improvement, safeguarding, promotion, and new program expansion and support of similar major emerging high-stakes perioperative advances in the future. The model’s goal and our work should center upon value, namely, the outcomes and costs that matter to the primary stakeholders of our work, our patients.

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