Podcast: Fetal Surgery

Dr. Corey Iqbal

Interview by Jason Newland, MD | September 18, 2013

JN: Good morning Children’s Mercy! Welcome to another edition of our weekly podcast. I’m Jason Newland, medical director of patient safety and a pediatric infectious disease doctor here at Children’s Mercy, and I’ll be your host again this week. Today we have a really exciting guest, Dr. Corey Iqbal. Corey has been in the Mercy system for awhile, but actually left and then came back and has been doing something pretty exciting around fetal surgery.

First off, thank you for taking time out of your busy schedule to join us for the weekly podcast.

CI: Glad to do it.

JN: Tell us a little bit about yourself. Tell us about your background and what led you to get into this fetal surgery.

CI: Well, I think like many of us who take care of sick babies and are frustrated with not being able to optimize the outcomes, the question has always been there, “Is there something that could be done before they’re born to alter the post-natal outcomes for babies?” And of course it was that very question that was posed 30 years ago by Mike Harrison at the University of California in San Francisco, when the preliminary studies and the foundation for fetal surgery was created.

JN: That’s obviously where you went and trained?

CI: Yes. That was a big draw; as they call it the “birthplace of fetal surgery.” That was the place I wanted to be. If you actually look at a lot of the successful fetal surgery programs throughout the country, they all have roots at UCSF, and they all spent time with Mike Harrison at some point in their career, and then branched out to other centers to develop programs.

JN: When you say fetal surgery, can you explain what that actually means? Because it sounds really hard.

CI: It encompasses a lot of different therapies that fall under that umbrella. I think the easiest way to think of it is to break it down in to four categories: percutaneous interventions; fetoscopic interventions that are done with small scopes placed into the amniotic cavity; you have open fetal procedures where the uterus is open and the baby is removed, an intervention is performed and the baby is put back into the uterus and then it’s closed; and then you have something known as the EXIT procedures, which stands for ex utero intrapartum therapy, which is when you partially deliver the baby, perform an intervention while the baby is on the placental circulation, and then deliver the baby immediately following. The most common scenario for that would be when you’re concerned about airway obstruction, such as a fetal neck mass. You would deliver the baby’s head, establish an airway and then convert the baby from fetal circulation to neonatal circulation.

JN: So right at the time of birth, but you utilize their mother’s circulation, and then you delivery them?

CI: Exactly! It’s quite more involved than when people think of that, they envision a cesarean section, but it’s not. The whole premise is keeping the uterus relaxed during an exit procedure. So the mom goes under deep general anesthesia, as opposed to just a spinal anesthesia that can be used for cesarean sections. That allows uterine relaxation; if the uterus contracts then the placenta will abrupt and you’ll lose the circulation, and you...
won’t have any way to support the baby. So it carries much more risk; specifically in bleeding for the mother. In a cesarean section it’s quite the opposite. You want the uterus to contract because that’s hemostatic and prevents the mother from bleeding.

**JN:** So you went through this training another year, on top of how many years did it take you to even get to where you’re a pediatric surgeon?

**CI:** I think I was 10 years in to it.

**JN:** So add another year, right? Because once you’ve gone 10 you may as well go 11! Now you’re back; you started back July 8. So what’s going on now to get Children’s Mercy involved in fetal surgery?

**CI:** Part of this has been continuing to foster our relationship that we have with the maternal fetal medicine doctors that now staff the fetal health center; getting the word out that we have this additional expertise that can be offered through the fetal health center so our referring providers know patients can be sent here for counseling. The other processes involve obtaining very specific equipment to do these interventions; some of which are under the auspices of the FDA, and require some regulatory steps in order to obtain them – specifically the fetus scopes. And then ultimately, putting protocols in place and getting patients here that need this intervention.

**JN:** So what kinds of things will you and your team be focusing on? What kind of procedures or conditions will the fetuses have that you’ll focus on?

**CI:** The most common procedure performed is fetoscopic laser ablation for twin/twin transfusions. When you have what is known as a monochorionic twin pregnancy – a pregnancy where the twins share the placenta, and just like siblings, they don’t share the placenta very well. So they form these vascular connections between their two umbilical cords. If that flow of blood becomes unbalanced and one baby is stealing too much of the blood, that causes twin to twin transfusion syndrome.

**JN:** Like one small baby and one big baby?

**CI:** Exactly! If that goes untreated the risk of mortality for those babies is over 90 percent.

**JN:** Wow!

**CI:** With the fetus scope in the amniotic cavity, you can use a laser to coagulate those abnormal vascular connections on the placenta. The survival that you then expect is an 85 percent chance of having a single twin survivor, and a 50-60 percent chance of having both twins survive.

**JN:** Oh, that’s fabulous!

**CI:** The survival benefit marked. Now any procedure we do always carries a risk to mom. So it’s this whole concept of treating the unborn patient; which can be a tricky one at times because every procedure requires a procedure for mom who doesn’t get any health benefit for it. Fortunately, for less invasive procedures like fetoscopy or percutaneous procedures the direct risk to mom’s health is minimal. But there’s certainly a risk to the pregnancy, so for something like a fetoscopic laser ablation, the most common problem we see is pre-term labor, which remains the Achilles heel of any fetal surgical intervention that we offer. And we would expect a rate of about 15-20 percent of pre-term labor; so there is some trade off.

**JN:** And that must be, obviously, one of the scary things about doing it.
CI: Absolutely! But we have such great neonatologist who can take care of the premature babies.

JN: That was going to be my next question. So when, during the time of pregnancy, would you perform a procedure like this? Like the first few months?

CI: Ideally in the second trimester. Most of these diagnoses aren’t made until moms have their 20 week ultrasound. The ideal time to intervene becomes between 20 and 26 weeks.

JN: And then obviously our neonatologists take care of a lot of low birth rate babies.

CI: Absolutely! So there’s the survivability of the infants beyond that if they get into trouble in utero. The other issue with that is the further along in gestation you get, the more irritable the uterus becomes. So it doesn’t tolerate interventions after 26 weeks as well as it would around 20 or 22 weeks.

JN: It sounds like the procedure you guys will really be doing a lot of is this twin to twin transfusion with the fetoscope.

CI: I certainly hope so.

JN: What are some others that could possibly be done?

CI: The other one that has really revolutionized the way people look at fetal surgery is the treatment of spina bifida or myelomeningocele. The reason I say that has been a dramatic shift in the way we approach fetal procedures is it’s the first procedure that has really been shown to have a benefit for a baby who is not sick in utero. The babies with spina bifida are not at risk for fetal demise and they’re not compromised; whereas babies with twin transfusion certainly are, or large sacrococcygeal teratomas that are causing cardiac failure are at risk for demise. Most babies with myelomeningocele deliver at term and don’t have problems throughout the pregnancy.

But now we’re talking about taking them out of the uterus fixing their back and putting them back in. The benefit that has been shown in multiple trials, and most notably the MOM’s trial – the management of myelomeningocele study that was a multi-center prospective randomized trial – showed that you decreased the rate of having to place ventriculoperitoneal shunts by 40 percent by fixing this in utero. And if you talk to Greg Hornig, he would be very enthusiastic about decreasing the number of calls he gets in the middle of the night for fevers and headaches in kids with shunts.

JN: Being an infectious disease doctor, the less you have to put shunts in, the less infections they’re going to get and the less heartache for everybody. So it’s huge to not have to put in a shunt that goes from somebody’s brain to their stomach. I mean, you guys have dealt with them from a general surgery perspective.

CI: Absolutely! And some other secondary benefits came out of it too; there were more children walking without assistance at three years of age in the fetal treatment group. Of course there were some tradeoffs with that; the babies who had the fetal repair, their mean gestational age was 34 weeks at deliver as opposed to the 38 weeks that you would expect in the post natal group. There were certainly higher maternal complications; need for blood transfusion after surgery, pulmonary edema related to that, and a not insignificant risk of uterine rupture. It has implications for future pregnancies in that all those moms have to delivery by C-Section at 37 weeks. While the evidence is there to certainly support its role to decrease the need for VP shunts, it’s still a very difficult decision for moms to make, and requires an extensive amount of multi-disciplinary counseling.
JN: Corey, I really appreciate you taking the time to talk to us. This is really exciting and we’re going to have to have an update! When do you think you’ll have the first procedure?

CI: I hope within the next few months. The fetoscopes are on their way from KARL STORZ, the word is getting out there that we should be up and running to do the fetoscopic laser coagulation for twin to twin transfusion syndrome. So hopefully when the first one hits the door, we’re up and running.

JN: Sounds great! I look forward to hearing about it and giving our listeners an update here in the coming year, and again, thanks so much for your time.

CI: Great, thank you.

JN: Again, thank you everyone for listening. Please let me know if you have any questions or advice or other topics you’d like to hear. I can always be reached by email at jnewland1@cmh.edu. Have a great week!