

BroadcastMed | Eskandari captions (2)

The syrinx is when you have fluid collecting within the substance of the spinal cord, causing the spinal cord to sort of start to blow up like a water balloon from the inside out.

And typically speaking, we think that that's caused by inappropriate fluid flowing through the spinal cord. And if you release the tethering, usually the syrinx resolves as well.

All kids with myelomeningocele have some element of spinal cord tether. The procedure that we did is a few things all in one. The first part was called a de-tethering operation of the spinal cord. And that by itself means that we disconnected areas that were holding the spinal cord down or basically tethering it to the very bottom of the spinal canal so that the spinal cord could be released and it can be more mobile. And especially during growth periods, it can move as the patient grows.

Then the second part of the procedure was called a laminoplasty. And a laminoplasty is when in order to get to the spinal cord itself, you have to remove the back parts of the bone of the spinal canal because the spinal canals kind of a circular space. The back part of the bone is called the lamina.

So what we try to do almost always is replace the bone at the end of the procedure. So a laminoplasty means that you remove the bone for your procedure and then you put it back into its anatomical position. And then the third part of the procedure was resection of a dermoid cyst, or epidermoid cyst. There they're basically the same thing.

They're a skin collection that is trapped within the abnormal tip of the spinal cord at birth in kids that have myelomeningoceles. And every kid has these abnormal skin cells trapped in there because of the fact that their spinal cord never folded into the right position. But not every kid develops these almost like a tumor basically.

It's a growth that grows very, very slowly over time. And in some kids, when these things do grow, they aid in tethering the spinal cord because they cause an inflammatory reaction because there's not supposed to be any skin cells in the spinal cord. And so the body's reaction to that is to wall off that area and create a cyst. And that in turn causes it to tether and get caught in some space that prevents the spinal cord from moving during growth.

So in Harper's case, we had already done a procedure on her at birth, which gave us a location to start from as far as knowing what area to do the surgery on. And based on the MRI and her anatomy, we knew that we had to go a little bit higher than what we had done for the procedure because she had physically grown from birth. So we started the procedure by opening up just above the area where we did her repair, myelomeningocele repair.

So she had a scar there. And we went above that area. And we found the first normal segment of spinal canal that she had. And using that as our guide, we just went lower and lower until we found the area of abnormality. And from there we removed that first piece of bone that we talked about and got into the spinal canal, where the spinal cord lays inside of a sac called the dura. And from that point, we opened the dura, and we found immediately right underneath where we opened that the spinal cord is literally being tethered right up against that dura.

So it was a that was the point of stickiness, so to speak. And that's when we then have to take our time and sort of make sure we meticulously release that area of the spinal cord without damaging the spinal cord itself. As we started releasing it, we found that epidermoid, dermoid, tumor-ish thing, the little sac full of skin cells, which you couldn't really see well on the MRI because it was very small.

But that was the actual substance that was tethering the spinal cord right there. Because it was within the spinal cord substance, you can't really remove all of it. You can't take out the whole sac including its wall because you'll damage the spinal cord. And we had methods within the surgery that we use to stimulate the spinal cord and the various nerves in that area to make sure that they're functional and we didn't damage anything.

And so we did that. And every time we stimulated around the wall of this cyst, nerves were being stimulated.

So we knew our only hope was to try and empty the contents of it as much as we could and sort of eliminate the space in which new skin cells could potentially form. And so we did that. We emptied the contents. We collapsed the sac in which those contents were there in the first place, minimizing the space that any future skin cells could potentially grow back into there. And after that we closed everything up and put her bone back on. And we use an observable fastening system, where the screws and the fasteners are made out of a sugar substance that just sort of dissolves over the course of a couple of years.

So at the end of all this, she'll have normal anatomy back in that one area. There are still some microscopic skin cells, even though we completely emptied the contents. And so most of the time these things do grow back because you can't remove the wall.

If you can remove the wall, if they're in a location where it's not dangerous, you can remove the wall. Then they usually don't come back. But in her case, most likely it will.

What we're hoping for is that by eliminating the space in which it can grow, even if it comes back, it'll be limited to being very, very tiny, and it won't be up against the edge where it can potentially tether again. Because by themselves they're not a cancer.

They're not going to have any kind of ill effect other than potentially causing tethering.

So we might see this come back over the course of decades. But they're so slow growing, I'm really hoping that we don't ever see it become a clinically significant entity.

Our timeline typically for patients in which we open the covering of the spinal cord and have to stitch it back together again is that they're flat for 48 hours. But that usually means they can roll around. So they can be on their belly. They can be on their side.

They can be on their back.

We just don't want them necessarily bringing their back all the way up and having a fluid column of pressure on that area where we stitched it up. Our goal is to not have that area leak.

And if we can get that first 48 hours, there's a lot of granulation tissue that even starts to build within that first two days. And in young kids, that's very, very quick, and it allows us to get some scar tissue in there. 48 hours later, she was walking.