

**SAMUEL OYER:** Facial reanimation really applies to multiple different surgical techniques that are all of use to help reanimate or reproduce movement and function in the paralyzed face. So over the last few years, there's been a little more emphasis on trying to get natural motion in the facial muscles that exist through reinnervation procedures and trying to get to it earlier than we may have done historically.

It's really a wide range of patients that could benefit from facial reanimation. We see people who are congenitally born with facial paralysis, those who have suffered a trauma and had their face paralyzed because the nerve has been injured, or after a tumor has been removed either in the brain stem region or in the parotid region in the face. The most common cause is actually Bell's Palsy, which we see more commonly in adults and those may need facial reanimation if they don't adequately recover. Pediatric patients, we often will see folks who are born with paralysis or who have a brain tumor removed to end up with facial paralysis following that.

The procedures are really defined based on the time frame of paralysis. So in the first one to two years after paralysis, it's often best to try to get some nerve to regrow or reinnervate the facial muscles that exist. So we typically are doing a nerve transfer or nerve graft type procedure. If it's a longer term paralysis, the nerves won't recover well and the muscles won't recover well. So then we have to bring in some other functional muscle, either a gracilis flap, like a micro neurovascular flap or a temporalis tendon transfer that can produce some motion.

The procedure we are demonstrating here is the masseter to facial nerve transfer procedure. So this is indicated for someone who's had a short term paralysis, less than a year and a half to two, but has intact facial nerves and facial muscles. So there's some ability to produce motion from those facial muscles by just connecting another nerve. So in this case, there was a brain tumor removed and there was some paralysis that didn't recover unfortunately. So here we're using the masseter nerve, which is the nerve that runs to the masseter muscle that's involved in chewing and actually disconnecting that nerve from the muscle and then connecting it end to end with one branch of the facial nerve that's targeted towards smile production. So those nerves are sewn together microscopically. And when the child then clenches his jaw, he's able to produce a natural smile motion in his own facial muscles.

The outcomes with the masseter nerve transfer have been quite good overall. It's been a shift

in the last decade or so. People are doing this more and more. The nice thing is you're using your own facial muscles so you're not having additional muscle bulk in the face or it's not distorting any tissue planes, anything like that. Typically after about three to four months, we start to see motion with a smile. And there's some retraining that's needed to make this smile more automatic because it does take a jaw clench initially. So we often work with our specially trained physical therapists to help retrain these individuals to produce a smile a little more naturally.

The risks are fairly low, which is another benefit of the procedure. Some risks of infection or hematoma are common in any surgery. We really don't see much impact on chewing. You're still able to chew well with full strength. So there's pretty limited morbidity related to this, which is one big advantage.

One of our main goals is to try to get facial reanimation surgery to the people who need it in a timely fashion. Like I said before, if you wait a year or two, this type of procedure may not be available with a nerve transfer, so you may need to do something more elaborate. So if we can get to folks within the first year or two, often we have options like doing nerve transfers. So we're trying to make that more available to people who may not live close by, even offering some video visits that a patient can do, much like a FaceTime or a Skype kind of visit. They can meet with us and see if they're a candidate for certain procedures like this.

I think the biggest takeaway for facial reanimation is potentially not waiting quite as long as we did in the past for natural recovery to occur. Traditionally, people would recommend waiting 12 months after paralysis to allow for recovery. But what we're seeing is if there's no good recovery at all in the first six months, you're probably not going to get amazing recovery over the full year. So it's OK to intervene oftentimes earlier, six months or so, rather than waiting a full year.