

ISTVAN TAKACS: Deep brain stimulation is the control of basal ganglia structures with electricity to interrupt the symptom pattern. And primarily, we use it for movement disorders, mostly Parkinson's disease, essential tremor, also dystonia. We have here at MUSC, also we use for obsessive compulsive disease and therapy-resistant severe depression.

Well at our center, the surgery is performed awake because what happens is that you use certain stereotactic paraphernalia, like a head frame or an indicator, and you choose visually on complex MRI fusion images your target. And then we aim for that target during our procedure.

Now, most of the time, where I said that we should be going is where we end up. And it turns out that that's where we needed to go. But we verify that. We use micro electrode recording intraoperatively because different parts of the brain sing with a different whale song. And as you're passing your electrode down through the brain, you're passing through different sound phenomena and different frequencies on an oscilloscope. And if all of that lines up in the right sequence, and your MRI's lined up visually, then you have reassurance that now you have two confirmations that you're going to the right place.

And thirdly, and perhaps most importantly, I keep the patients awake. The interesting thing about the brain is that it feels and knows everything except itself. So there is no pain involved in actual brain surgery. And it doesn't really matter whether the oscilloscope, the micro electrode recording, or MRI tells us that we are in the right place if the patient's performance does not change. In essential tremor and in Parkinson's disease, the changes are instantaneous. They happen right there within minutes on the operating table.

So therefore I like to keep mine awake because anything that is not absolutely perfect right there on the table, and they feel it, like they should, and don't present with any side effects that they would rather not have, then we can fix it right there on the table.

Deep brain stimulation consists of several parts where the surgical parts may be the one that one primarily thinks of as the precision work. But the patients have to be chosen correctly. Their medications, their disease progression, their functional status has to be well assessed, and it has to continue to be assessed, and their medications as they were weaned off their medications in favor of the electric stimulation, all of these require specialists. All of these

require movement disorder specialists, dedicated movement disorder specialists.

So while at some places, you can have the surgery performed, you don't have the comprehensive care for the patient as we have here. We have a very strong movement disorders center where the surgical patients don't just get injected and orphaned. They are taken care of by the same people who vetted them for surgery. They are taken care of by the same people after the surgery, which gives people a great sense of security and belonging.

Well the take away message is that the DBS is now a firmly established modality for movement disorders, at least, and everybody is worth an evaluation. It used to be that you had to have disease for five, 10, 15 years and have eaten your way through everything available in terms of drugs. And now we know that you can make the biggest difference for people not only health wise, but also socioeconomically by not considering DBS as a treatment of last resort, but as a fairly early option.

What is exciting about this is that you actually make a huge difference. In so much of neurosurgery, we are sort of digging in our heels and delaying the inevitable in so many ways. Here you can actually turn things around. You can put people back in a car who couldn't drive for a decade. You can make people stay in their house who would otherwise have gone to a nursing home. Young people with bad dystonia can go out and date and get married and have a life.

So there are really neat effects to this, and as physicians, we also need some successes sometimes that give you goosebumps. And it still does.