

Transcript Details

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Minimally Invasive Spinal Surgery

MINIMALLY INVASIVE SPINE SURGERY

ReachMD would like to wish you a happy and healthy New Year and with each New Year comes a fresh start. As we look ahead, ReachMD is proud to present this month's special series Focus on Future Medicine.

Many of our patients who suffer from significant back pain put off surgery as long as they can using medical and physical therapy while hoping to avoid an elaborate operative procedure, yet as with so many areas of medicine today, minimally invasive techniques are providing new options for patients with back pain and others who face surgery. As with all new procedures, we have to ask what are the fundamental risks and benefits. You are listening to ReachMD, The Channel for Medical Professionals. Welcome to The Clinician's Roundtable. I am your host, Dr. Mark Nolan Hill, professor of surgery and practicing general surgeon. Our guest is Dr. Paul Holman, a neurosurgeon for the Methodist Neurological Institute at the Methodist Hospital in Houston.

DR. MARK NOLAN HILL:

Welcome Dr. Holman.

DR. PAUL HOLMAN:

Thank you for having me on the show, Mark. Appreciate the opportunity to talk about minimally invasive surgery today.

DR. MARK NOLAN HILL:

Well, let's talk about that Dr. Holman. You know, everyone is quite familiar with laparoscopic gallbladder removal as opposed to open gallbladder removal and laparoscopic fundoplication for GERD and arthroscopic surgery for knees as opposed to open surgery for knees; well what exactly is minimally invasive surgery on the spine?

DR. PAUL HOLMAN:

Well, minimally invasive surgery in this concept is basically performing the same operations that we have done for years,

decompressing nerves that are causing pain, but trying to approach the spine with less collateral damage and therefore improving the recovery process for the patient.

DR. MARK NOLAN HILL:

But how do you really do that?

DR. PAUL HOLMAN:

Well, in the old days performing spinal surgery involved making very long incisions in splitting the muscle off the spine to be able to identify the correct anatomy and minimally invasive surgery really started to take on some traction with the development of what are called tubular systems where we split the muscles with small dilators and provide the same type of exposure with less of an incision and less blood loss.

DR. MARK NOLAN HILL:

And you use the microscope during this?

DR. PAUL HOLMAN:

We do. Some spinal surgeons prefer to use the operating microscope which we have used to do brain surgery for many years while some orthopedic spine surgeons are more familiar with using endoscopes from their experience with knee surgery, and so either the microscope or the endoscope helps us to do the surgery because we are working through very small incisions.

DR. MARK NOLAN HILL:

Can all traditional spinal surgeries now be done minimally invasive?

DR. PAUL HOLMAN:

I wouldn't go so far as to say that all surgery can be done in this way, but I think the spinal surgery community has been very appropriate in bringing the technology along slowly to make sure that we can get the same types of outcomes in terms of relief of pain and success of the surgery in terms of getting solid fusion for trying to weld bones together and we are starting to reach out to more complex situations such as spinal trauma and scoliosis with increasing success.

DR. MARK NOLAN HILL:

Are all patients candidates for this minimally invasive surgery if they would have been candidates for traditional surgery?

DR. PAUL HOLMAN:

I think for the typical operations that is done for degenerative problems such as herniated disks or spinal fusions for unstable segments that are just due to the arthritic wear and tear process of the spine, we are finding now that there aren't too many of these day-to-day operations that can be done through a minimally invasive approach.

DR. MARK NOLAN HILL:

Take us through, let's say, the decompressive procedure and fusion, how would you do that in a minimally invasive fashion?

DR. PAUL HOLMAN:

Well, again, as I mentioned before instead of making a very long incision, we typically to perform a decompressive portion of the operation, we will choose the site where patient has the majority of their pain. Many times when the patient has a herniated disk, the symptoms are in one leg and so we will put our tubular retractors and dilate the muscle gently and seat the retractor on the bone that covers the back of the nerves and then using the operating microscope or endoscope, we will use a combination of small drills and rongeurs to thin the bone and expose the nerves and remove disk or arthritic bone material, so we freed up the nerves and completed the first portion of the operation and then the fusion involves typically putting spacers in between the vertebrae to restore the height that's been lost due to saddling of the disk and filling those spacers with bone graft and then inserting tiny titanium screws into the bones to immobilize them and then allowing the bones to mend over several months.

DR. MARK NOLAN HILL:

So if you have multi-level disease, does that mean you make multiple incisions as opposed to one long incision?

DR. PAUL HOLMAN:

For multiple-level disease with the types of retractors that we have now, we can typically center the incision between the two levels and still work through a relatively small incision and get to both levels so we still use a smaller incision and this is again one of the reasons why performing surgery is associated with less blood loss because multiple level surgeries with a traditional approach typically involved really long incisions and extensive muscle dissection.

DR. MARK NOLAN HILL:

Now, are these procedures being performed by most neurosurgeons across the country or there are just a handful of programs?

DR. PAUL HOLMAN:

I think that in general, minimally invasive surgery is catching on to most neurosurgeons that perform a lot of this type of surgery, you have to remember that not all neurosurgeons and not all orthopedic surgeons, for that matter, do a lot of complex spine surgery with the fusion operations, but I think that certainly the surgeons that have been trained in the past 5 or 10 years have learned some of these

techniques during their training and there are certainly a lot of courses that are being developed for doctors to practice these techniques and really the actual surgery itself with you get down to working around the nerves is really no different than what we've done for years. It's just learning how to use these retractors and the systems of putting in screws through small incisions.

DR. MARK NOLAN HILL:

Dr. Holman, is this surgery for the surgeon more difficult?

DR. PAUL HOLMAN:

I would say that any new technique that you are learning as a surgeon has a what we call a learning curve, so for doctors that aren't used to working with a microscope, let's say there certainly is some frustration in the beginning because the surgery will definitely take longer until you reach a certain number of cases and then you pretty much will find that the operative times are equivalent to open type procedures, but there is always a learning curve and that's something that a surgeon has to be willing to endure to be able to master these techniques.

DR. MARK NOLAN HILL:

Has there been any reluctance to neurosurgeons and orthopedic surgeons learning these techniques and doing these procedures?

DR. PAUL HOLMAN:

I think there has been a certain amount of reluctance and that probably is a reflection on the integrity of doctors in general in that many times technology is in search of an operation or an application and so many doctors will be skeptical that doing these operations with more expensive technology that requires extensive training might not be better for the patient, but I think the minimally invasive techniques have been around long enough now and we've seen numerous publications in our peer-reviewed journals and that most doctors you know are starting to accept this as not a gimmick, but really something that's better for patients.

DR. MARK NOLAN HILL:

Let's talk about the technology a bit. What kind of technology do you use in the operating room? Real-time CT-like images, is that hard to learn?

DR. PAUL HOLMAN:

It isn't, I would say probably in terms of the technology that thing that's made minimally invasive spine surgery a reality other than these retractor systems that we talked about are the what we call percutaneous screws, being able to put screws into the bone without damaging the nerves and doing that in a reproducible way and accurate way and one of the technologies that we are using at Methodist Hospital something called the O-Arm and what this is an intraoperative CAT scan that we use to take pictures of the spine and we transfer that information to computers that give us a 3-dimensional view of the spine and we can track all of the screws and the instruments that we use and this has really been an amazing technology that's taking off and has made the procedures even safer and easier to learn.

DR. MARK NOLAN HILL:

What about the complications of these procedures as compared to traditional surgery?

DR. PAUL HOLMAN:

I think that the publications and the data that we are getting back in our peer-reviewed literature show that in general the complications with regards to irritation of the nerves, the actual work that we are doing that's essentially equivalent, have not been any different than what we've seen throughout the years and I think it's become pretty evident that the amount of blood loss and the rate of infection after the minimally invasive surgeries appears to be less extensive than with open operations and I think this is going to be the number one difference between the two types of surgeries.

DR. MARK NOLAN HILL:

And what about the success of, let's say, decompression and fusion doing it with minimally invasive techniques, just as good as open procedures?

DR. PAUL HOLMAN:

I think it's just as good. If you talk to any spine surgeon, they will tell you that above all else, the success of spine surgery is definitely dependent on patient selection so if you are doing the operation for the right reason and we are certain based on our diagnostic test that we understand where the problem is coming from in the spine, then our success rate for elimination of sciatica and mechanical low back pain is outstanding.

DR. MARK NOLAN HILL:

Are there any patients that you wouldn't choose for minimally invasive surgery?

DR. PAUL HOLMAN:

I would say that some of the scoliosis operations that we do, particularly in teenagers where you are fusing over more than 10, sometimes 15 levels that the technology at least at this point in time is not advanced enough to do this with the same type of speed and precision that it's done in an open procedure so I think for some of the longer operations in terms of the number of segments that you would have to include in a fusion that might be something that's really not gotten to the point where the surgery is really better for the patient, but I would assume that over the years to come that we are going to find that more and more of these procedures can be done, but we have to wait until the technology catches up with the applications.

DR. MARK NOLAN HILL:

So looking at the patient's perspective, what makes it better for them to have minimally invasive surgery?

DR. PAUL HOLMAN:

I think that when you look at the stress of having surgery, the amount of tissue damage and muscular dissection and the amount of blood that you lose during surgery that just puts a generalized stress on the patient's system if they need to have blood transfusions that delays their hospitalization and I think when you are able to make smaller incisions you have less trauma to the muscle and less blood loss, that just helps people to get through the surgery quicker and the recovery seems to be smoother.

DR. MARK NOLAN HILL:

What about time of recovery, do they get out of the hospital earlier?

DR. PAUL HOLMAN:

For small operations like what we would refer to as a discectomy where we are not doing a fusion, I would say that the hospitalization is equivalent with open procedures because many experienced spinal surgeons can do the same type of operation through fairly small incisions, but when you start looking at the fusion operations, the data that we have now shows that patients that have minimally invasive surgery probably get out of the hospital 1-1/2 to 2 days quicker on average and when you look at a 4- to 5-day hospitalization, that's a pretty you know significant difference.

DR. MARK NOLAN HILL:

Now in these patients we have fusion, whether you do it minimally invasive or do it traditionally open, does the length of time for them to resume normal activities stay the same?

DR. PAUL HOLMAN:

I think it does because whether you use a minimally invasive over an open procedure, the bones are still going to heal and fuse over the same period of time and I think that we still have to put similar restrictions on patients in terms of going through a very controlled regimen at physical therapy and sometimes aqua therapy, process where they are rebuilding and stretching the muscles on the back. So overall the global process of healing from these surgeries is about the same, but again certainly the hospitalization and the amount of pain that people have immediately after surgery is really the key difference.

DR. MARK NOLAN HILL:

I want to thank our guest, Dr. Paul Holman. We've been discussing minimally invasive spine surgery.

I am Dr. Mark Nolan Hill and you have been listening to The Clinician's Roundtable on ReachMD, The Channel for Medical Professionals. Be sure our website at www.reachmd.com featuring on demand pod casts of our entire library, and thank you for listening.

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