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The SURGICAL Possibilities

Cervical Spine Surgery at Neurological Surgery, P.C.

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Artem Y. Vaynman, M.D., spine surgeon at Neurological Surgery, P.C., (center) and Sachin N. Shah, M.D., neurosurgeon at Neurological Surgery, P.C., (right) discuss cases and formulate treatment plans utilizing current technology.

TODAY, THE SPECIALISTS AT NEUROLOGICAL SURGERY, P.C. ARE USING A GLOBAL APPROACH TO TREAT CONDITIONS SUCH AS CERVICAL DEFORMITIES AND INJURIES TO IMPROVE A PATIENT'S OVERALL HEALTH.

NEUROLOGICAL SURGERY, P.C. is home to 30 specialists, 13 of whom are skilled spine surgeons and several of whom have dedicated their practices to the correction of conditions, deformities and injuries of the cervical spine. This focus includes treatment for patients with degenerative scoliosis or severe spondylosis, older patients suffering from adolescent scoliosis that was never properly treated and patients whose previous spine surgeries did not properly heal and eventually contributed to a cervical deformity.

Patients can present with pain in the arms and neck, weakness in the hands, difficulty swallowing, and change in gait. Severe conditions can even result in the reversal of the natural, gentle curvature of the spine or a misalignment that leaves the head bent so far forward that the patient's chin rests on his or her chest. According to Artem Y. Vaynman, M.D., Co-Chief of Spine Surgery at Mercy Medical Center and spine surgeon at Neurological Surgery, P.C., the approach may vary, but the fact remains that once the spine is bent, surgery is the best opportunity to successfully correct the deformity.

As opposed to the traditional approach of solely addressing spine issues locally, surgeons at the Long Island practice are focusing on and reconceptualizing how concerns in one section of the spine relate to the rest of the spine. This shift translates to patient care when, for example, Sachin N. Shah, M.D., neurosurgeon at Neurological Surgery, P.C., is treating discogenic pain in the lumbar spine or a lumbar deformity. In formulating a course of treatment, he now factors in how the condition and its therapy will impact the whole alignment of the spine.

"Most spinal surgeons have learned to take care of problems regionally in the spine. The shift in the knowledge base arises from the question, 'How do we take care of a problem that is much more regional, but can lead to global consequences?'" says Dr. Shah. "This is one of the biggest changes for surgeons, particularly spinal specialists, which is why I am beginning to think in the sense of achieving global sagittal balance."

The Solutions

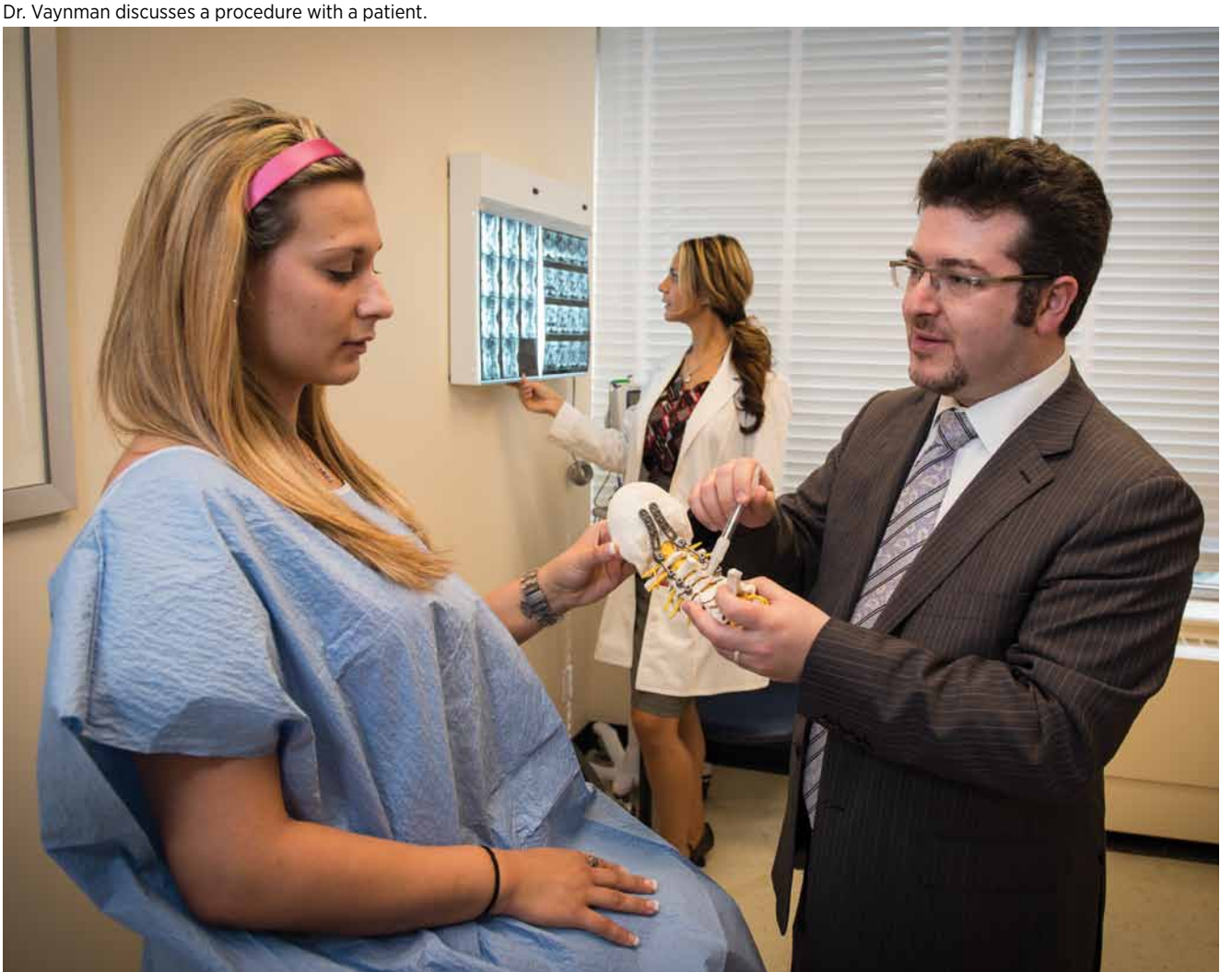
In addition, Drs. Vaynman and Shah have an in-house algorithm to help them map the best surgical course, given a patient's unique condition and presentation in the cervical spine. Cases are categorized based on whether they are degenerative or caused by trauma. If a patient's injury is due to the latter, a surgeon can approach the spine from the anterior or the posterior, based on his or her preference and the specific level of the cervical spine impacted.

Severe cervical deformity after previous decompression


One year after corrective surgery

If, on the other hand, the patient's condition is related to degeneration — such as a cervical spine deformity — surgeons at Neurological Surgery, P.C. move to the next phase of the algorithm. They determine if the case involves single or multiple cervical levels. A single level would indicate an anterior approach, while multiple levels lead surgeons to another question. The next determining factor becomes the alignment of the spine. If the alignment is healthy, Drs. Vaynman and Shah continue with an anterior approach.

Dr. Vaynman discusses a procedure with a patient.



Dr. Shah explains the anterior cervical fusion procedure to his patient prior to performing the surgery.

MEET DR. SHAH

AS A NEUROSURGEON at Neurological Surgery, P.C., Sachin N. Shah, M.D., has dedicated his professional practice to the evaluation and treatment of adult scoliosis, spinal cord tumors and malformations, and spinal deformities. His expertise in the operating room ranges from complex and revision spine surgery to minimally invasive alternative therapies, including microdiscectomy and kyphoplasty procedures, as well as cervical laminoplasty to relieve trauma or disease-related pressure on the spinal cord.

Dr. Shah began his education at the University of Florida, earning a degree in chemistry, and received his medical degree from the University of Miami Miller School of Medicine. He completed both a neurological surgery internship and residency at Emory University Hospital, followed by a spine fellowship at the University of Miami Hospital.

His current memberships include the American Association of Neurological Surgeons, the Congress of Neurological Surgeons and the American Association of Physicians of Indian Origin. Dr. Shah has also widely published and presented on topics concerning cervical spinal surgery, specifically the clinical outcomes of cervical laminoplasty in treating cervical spondylotic myelopathy.

Should a patient's alignment be compromised — if there is evidence of multilevel spondylosis and compression of the spinal cord — specialists are again presented with two options. They can recommend a laminectomy with a fusion procedure or a laminoplasty, in which the surgeon does not completely remove the lamina. Finally, as Dr. Shah explains, in the case of a cervical spine deformity, surgeons may, at their discretion, bypass the algorithm in favor of a 360° procedure, which features both anterior and posterior approaches to the spine.

"The algorithm allows physicians to explore their options in treating a patient's case," says Dr. Shah. "As surgeons, we may have a question about whether to treat from the front of the neck or the back of the neck. The algorithm can help answer those questions a physician might have in approaching a patient with a spinal deformity."

The Correction

When addressing a deformity, a surgeon also has the option of employing an anterior cervical fusion. Drs. Vaynman and Shah provide expert care for complex cases of spinal deformities, as well as more common conditions, such as an impingement from a herniated disc that then compresses a nerve.

"The second most common presentation we see is surgery related. What happens is that a spinal surgery does not heal properly or the disease progressed to different levels because the fusion did not take," says Dr. Vaynman. "When performing a fusion surgery, the goal is to decompress the nerve, which requires destabilizing the bone. In some cases,

that can lead to the spine restenosing in two or three years if the bone does not heal correctly."

With the anterior fusion, the surgeon has the distinct advantage of accessing the spine through natural plains in the tissue rather than having to cut through muscles, as is the case with a posterior incision. This procedure involves approaching the spine to first remove the deformed disc or discs, and decompressing the affected nerve and spinal cord. Surgeons at Neurological Surgery, P.C., then use a bone graft or a selection of instrumentation — such as plates and pedicle screws — to restabilize the spine.

"There has been a definite shift in the approach and technology over the past 30 years," says Dr. Vaynman. "Now, the devices we're using allow for segmental correction at each level, which distributes the stress in small amounts across all planes rather than placing the weight on two levels of the spine."

Following surgery, Dr. Vaynman monitors his patients every month for the first three months and then on a schedule of gradually extending intervals. Patients may experience pain around the incision for six weeks and are advised not to return to driving until after this period. He explains that patients' return-to-work timelines can vary depending on their professions.

Alternative Treatment

An alternative to cervical fusion, and an avenue by which to treat multilevel cervical spondylosis, is cervical laminoplasty — a unique offering within Dr. Shah's practice. The procedure, which originated in Japan, allows patients to retain more function and flexion in the neck than with a traditional fusion. As Dr. Shah explains, an operation resulting in spinal pain relief but diminished basic functions can be frustrating for patients — which is a motivation for him to recommend laminoplasty for appropriate candidates, such as patients who have retained the natural spinal curvature.

The procedure itself accesses the spinal cord through a posterior incision while the patient's spine is monitored with imaging devices to avoid any unintended surgical damage. The nuance of laminoplasty comes from addressing the lamina and, rather than excising the area, making two differing cuts to both sides of the structure. (Dr. Shah scores one side of the lamina to form a vertical groove and fully severs the other side.) The groove serves as a hinge, which connects the lamina to the spine with a bit of give, as that section of the vertebrae opens like a door.

The opening instantly restores the normal spinal canal diameter as the pressure, which the patient has experienced in the form of arm, back and neck pain, is relieved. Additionally, spinal fluid returns to its natural flow around the area. Dr. Shah then uses the opening to explore the spinal cord and extract the origin of the spinal compression. To help guarantee the newly created space is not lost and the same disease pattern does not develop after the surgery, he places a bone graft wedge between the two pieces of the lamina on the side he fully cut. The grafts are held to the vertebrae with screws and metal instrumentation.

"For a laminectomy, we completely remove the lamina from both sides, whereas in a laminoplasty, we keep one side of the lamina in the spine and one side widened by implanting grafts," says Dr. Shah. "I prefer the laminoplasty because keeping the lamina open helps ensure long-term success for the patient."

The 360°

For cases in which a deformity of the cervical spine has progressed to significantly advanced stages — such as when a patient's chin is resting on his or her chest and the patient is experiencing difficulty performing simple functional tasks, including looking straight ahead and swallowing — Neurological Surgery, P.C. offers an extensive surgical intervention that relieves compression, removes diseased bony anatomy and realigns the spine in one setting. The 360° operation begins with an anterior

Intraoperative photo of open door expansile laminoplasty with rib allografts
Rib grafts are the key to maintaining the spinal canal decompressed, which further ensures long-term satisfaction of symptom relief for the patient.

"Neurological Surgery, P.C. covers the entire spectrum of spine care. Our staff of specialists is not limited in any way, and the physicians can perform any of the treatments that are within the scope of a fellowship-trained spine surgeon's practice."

— Artem Y. Vaynman, M.D., Co-Chief of Spine Surgery at Mercy Medical Center and spine surgeon at Neurological Surgery, P.C.

MRI of the spine gives insight into the patient's problems.

MEET DR. VAYNMAN

ONE OF THE neurosurgeons at Neurological Surgery, P.C., who specializes in spine surgery, Artem Y. Vaynman, M.D., provides expert care for a wide scope of spine concerns, including back pain, compression fracture, degenerative scoliosis, herniated disc, sciatica and spinal stenosis, in both complex and minimally invasive surgery settings.

Dr. Vaynman earned his undergraduate degree in biology at New York University College of Arts and Science. He received his medical education at State University of New York–Downstate. Dr. Vaynman next completed residencies in both general surgery and neurosurgery at the New Jersey Medical School University Hospital. This led to two chief neurosurgery residency positions — one at Hackensack University Medical Center and then another at the New Jersey Medical School University Hospital.

Dr. Vaynman added to his medical training with a fellowship in complex spine surgery at The Cleveland Clinic Foundation. In 2010, he was appointed Co-Chief of Spinal Surgery at Mercy Medical Center.

Dr. Vaynman's current memberships include the American Association of Neurological Surgeons and the Congress of Neurological Surgeons, and he has presented at both organizations' annual meetings.

approach, shifts to a posterior approach and then returns to the anterior to complete the procedure.

To start, patients lie on their backs with their heads fixed in a Mayfield holder to immobilize their necks during the operation. The surgeon accesses the spine through an anterior incision and performs a discectomy at the level or levels impacted by the deformity to loosen the spine up to 15°. This step is followed by the implantation of a bone graft to replace the removed disc or discs. However, the surgeon would not at this point place any instrumentation to anchor the neck. The incision is closed, and the patient is then carefully brought out of sedation and repositioned for the second phase.

Once the Mayfield holder has been re-secured, the surgeon approaches the spine through a posterior incision. This second stage involves a facetectomy, which — coupled with the extra range of the spine provided by the anterior discectomy — allows the surgeon to align the spine and return it to its natural state. Once the correct alignment has been reached, the spine can be fused using an array of instrumentation. The patient is then rotated once more for the final stage of the operation. With the new alignment secured from the back of the neck, the surgeon must re-enter the front of the neck to fix a plate onto the spine. Although the 360° operation is not the standard course of treatment and is only appropriate for select patients, Dr. Shah reports favorable results from the surgery.

"My feeling is that, in this day and age, patients and physicians still have reservations about spine surgery, and they shouldn't," says Dr. Vaynman. "We can offer a lot of patients significant pain relief, return to function and improved quality of life."

To learn more about the surgical options for the cervical spine at Neurological Surgery, P.C., visit www.nspc.com.