Treatment of Idiopathic and De Novo Scoliosis in Adults

Surgeons from the departments of orthopaedic surgery and neurosurgery at Penn Medicine have developed a program to provide the full spectrum of treatments for adult patients with scoliosis of the spine.

Generally defined as a curvature of the spine in excess of 30°, scoliosis has two primary classifications in adults: idiopathic disease originating in adolescence, and de novo (or degenerative) scoliosis occurring in middle age and later life. Idiopathic scoliosis affects the thoracic/lumbar spine and has an unknown etiology. De novo scoliosis affects the lumbar spine and is usually caused by progressive intervertebral disc degeneration. In adults, both types of scoliosis are associated with pain, disfigurement and varying degrees of disability.

Treatment for scoliosis at Penn begins with conservative (non-operative) approaches, with the objective of controlling pain and maintaining function. Typically, conservative therapy involves exercise and conditioning regimens combined with physical therapy and, when warranted, nonsteroidal anti-inflammatory drugs and/or epidural steroid injections.

Surgery has the objective of minimizing pain and ameliorating spinal curvature, and is indicated when pain is unremitting or significant coronal or sagittal decompensation occurs. Chief considerations include the likelihood of successful outcome and the potential for complications given the patient’s age, history and condition.

At Penn, surgery for adult scoliosis involves thorough preoperative evaluation and planning to tailor the procedure to the needs of the individual patient; the primary goal is to minimize complications. Surgeries include posterior and/or anterior spinal fusion and segmental instrumentation; vertebral column resection; pedicle subtraction osteotomy; and spinal reconstructive surgery. Most patients are ambulatory within 24 to 48 hours of surgery. In many instances the scoliosis surgery will involve the expertise of both the orthopaedic surgeon and neurosurgeon.

CASE STUDY
Mrs. A, a 62-year-old female presented with incapacitating back and leg pain and ambulatory impairment. She could walk only with the aid of a walker and her posture was significantly stooped. Mrs. A’s medical history included four surgeries (among them a lumbar fusion) and failed attempts at conservative treatment, including, physiotherapy, pain medications and epidural steroid injections.

X-rays demonstrated a severe sagittal imbalance and a degree of curvature exceeding 30° (Fig. 1). Following a consultation, and after thoroughly understanding what her surgery involved, Mrs. A agreed to have a pedicle subtraction osteotomy and extension of her fusion down to the pelvis.

The surgery, which involved the removal of vertebral bone and the placement of pedicle screws and rods, was performed in seven hours. A year after her surgery, Mrs. A’s pain level has dramatically decreased. Her posture is now upright (Fig. 2) and she can walk without a walker.
FACULTY TEAM

The Spine Service at Penn Medicine involves the expertise of a multidisciplinary team that, in addition to orthopaedic surgeons and neurosurgeons, includes neurologists, rheumatologists, oncologists, physical therapists, physiatrists, radiologists and pain management specialists. This extensive and collaborative team approach to spine care ensures a thorough consideration of both surgical and nonsurgical treatment of pain and neurological symptoms.

Performing Scoliosis Surgery at Penn Medicine

Vincent Arlet, MD
Chief, Orthopaedic Spine Surgery

Issam A. Mardini, MD, PhD
Assistant Professor of Clinical Anesthesiology and Critical Care

Andrew H. Milby, MD
Assistant Professor of Orthopaedic Surgery

Michael R. Murray, MD
Clinical Associate of Orthopaedic Surgery

Comron Saifi, MD
Assistant Professor of Orthopaedic Surgery

Harvey E. Smith, MD
Associate Professor of Orthopaedic Surgery

Yejia Zhang, MD, PhD
Assistant Professor of Physical Medicine and Rehabilitation
Assistant Professor of Orthopaedic Surgery

ACCESS

Penn Orthopaedics
Pennsylvania Hospital
1 Cathcart
800 Spruce Street
Philadelphia, PA 19107

Penn Medicine Valley Forge
1001 Chesterbrook Boulevard
Berwyn, PA 19312

Penn Spine Center
Pennsylvania Hospital
Spruce Building, 3rd Floor
801 Spruce Street
Philadelphia, PA 19107

Penn Musculoskeletal Center
Penn Medicine University City
8th Floor
3737 Market Street
Philadelphia, PA 19104