Scoliosis is a postural deformity characterized by a lateral curvature of the spine. There are eight different types of scoliosis: neuromuscular, congenital, neurofibromatosis, connective tissue, osteochondrodystrophy, metabolic, nonstructural, and idiopathic.1 Idiopathic scoliosis can be classified in three groups: infant, juvenile, and adolescent. Adolescent idiopathic scoliosis (AIS) is the most common spinal deformity, which is a three-dimensional deformity that potentially presents long-term physical and psychological adverse impact.2 The purpose of this report is to present a case of adolescent idiopathic scoliosis in a collegiate golfer.

Background

A 19-year-old female college golfer (NCAA Division II) was first diagnosed with idiopathic thoraco-lumbar scoliosis when she was 13 years old. She exhibited a “hump” on her back when bending forward. Prior to this development, she had never complained of any significant back pain. Her family physician diagnosed scoliosis and referred her to an orthopedist. The plan was to monitor her scoliosis over the next few years.

The athlete returned to the orthopedic physician nine months later for a follow-up examination. She had no back pain or change in symptoms and had recently experienced a growth spurt. At the time of her follow-up visit, her height was 162.6 cm (5 ft, 4 in). Her right hip was observed to be 2 cm higher than her left hip while standing. She did not exhibit a right thoracic rotational prominence; she demonstrated full range of motion of the knee and hip joints and demonstrated a normal gait pattern. Radiographs demonstrated a lack of normal thoracic kyphosis, a right 40° curve in T5 through T12, and a left 42° curve in T12 through L5. This is classified as a Riser Stage II. Because her growth plates were not closed, bracing was not an option to correct her scoliosis.

At the age of fifteen, the athlete’s height was unchanged, but her thoracic curve (T5 through T12) had increased to 42° degrees, and her lumbar curve (T12 through L5) had increased to 47° degrees. This is classified as Riser Stage V. The orthopedic physician recommended surgery to correct the excessive curvature, but the athlete declined. Over the next few months, her back pain increased significantly. She had trouble sitting for extended periods, leaning forward, and playing golf. She decided to start physical therapy, with a goal of decreasing pain and increasing strength. The rehabilitation program focused on strengthening her upper back and core muscles and increasing her flexibility. Back strengthening exercises included wall push-ups, seated rows with tubing, prone shoulder flexion, abduction, scaption with weights, and seated press-ups. Core strengthening consisted of supine double-leg bridging, with progression to single-leg bridging with contralateral knee extension. Flexibility exercises included lumbar rotation, supine hamstring stretching, and a standing side stretch.

At the age of 17, the athlete experienced significant back pain that was primarily located around her scapulae and in the mid-thoracic area. She stopped playing golf because of pain. She discontinued physical therapy.
therapy, because she did not notice any improvement in her symptoms. Prior to going to college, surgery was discussed again, but she declined.

During the athlete’s freshmen year of college, the orthopedic physician prescribed a heel lift to correct her pelvic rotation, but the approach was unsuccessful. Her pain was constant and continued to increase, especially with forward bending and when lifting heavy objects. Physical therapy focused on core strengthening and flexibility was unsuccessful. She began her collegiate golf career, but the physical activity dramatically increased her back pain. The pain was so significant that she withdrew from two fall tournaments. Due to the constant nature of her back pain and the inability to alleviate the pain, she decided to withdraw from college and have the corrective surgical procedure performed.

The surgical procedure requires approximately five hours for completion. At the time of surgery, her height was unchanged, her thoracic curve (T5-T12) was 56°, and her lumbar curve (T12-L-5) was 46°. Surgery did not guarantee that she would become pain-free. The procedure would fuse either her L3 or L4 vertebra, which would limit her range of spine motion and potentially cause problems in the future. The orthopedic physician recommended a thoracic-lumbar scoliosis fusion with instrumentation and an allograft. The surgeon performed the Harrington technique, which involves the posterior implantation of prestressed stainless steel rods and hooks. One rod is placed more distal, and the other rod more medial to the curvature. The rod is designed to gradually increase tension between the rod and the hook, thereby decreasing the curvature of the spine.

Immediately after surgery, the athlete’s height was 167.6 cm (almost 5 ft, 6 in), the thoracic curve was reduced to 24°, and the lumbar curve was reduced to 20° (Figure 1). While in the hospital, she started physical therapy that was focused on restoration of balance, proper posture, coordination, and muscle endurance. She was released from the hospital at one week postsurgery and received home physical therapy focused on making transitions from lying to sitting, sitting to standing, and progression to walking. The physical therapy did not address muscular strength, endurance, or flexibility. At three months postsurgery, she was pain-free and returned to normal activities, including putting. At six months postsurgery she was allowed to start driving a car, to start working with isotonic weight machines, and to gradually return to playing golf. At nine months postsurgery, she returned to college and competed in ten of thirteen golf tournaments, with scores that were comparable to those attained before the surgery.

Discussion

Approximately 70% of scoliosis cases reported in North America represent idiopathic scoliosis. Two percent of all adolescents suffer from AIS. Although its cause is unknown, girls are five times more likely to experience progressive worsening of the condition than are boys. Mild curvature is common in both genders.

Idiopathic scoliosis is classified as infant, juvenile, or adolescent. Most infant idiopathic curves are self-resolving, which are common birth to three years of age. Juvenile idiopathic (JIS) is more severe, which affects children from three to ten years of age. AIS increases rapidly during growth spurts, which affects