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Adolescent Idiopathic Scoliosis

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A 12-year-old girl presented for evaluation of scoliosis. Over the past year, her family had noticed that the curvature of her spine had worsened. The patient reported lower back pain, particularly in the mornings, but denied exercise intolerance; she described herself as sedentary and rarely exercised. Menarche had begun 6 months ago. Her family history was negative for scoliosis.

Physical examination. On physical examination, the patient's height was 158.7 cm (50th-75th percentile) and her weight was 40.7 kg (25th-50th percentile), equaling a body mass index (BMI) of 17 kg/m^2 (28th percentile). Examination of her back showed elevation of the right shoulder, scapular prominence, asymmetric flank creases, spacing between the trunk and arm, elevation of the right hip, and a right-sided thoracic curvature. Results of the Adams forward bend test were positive for scoliosis (**Figures 1 and 2**). No pectus, heart murmur, or café au lait macules were noted, and she was at Tanner stage 4.

Figure 1. *Posterior view of patient.*

Figure 2. *Adams forward bend test.*

Diagnostic tests. The initial radiograph of the spine showed a right-sided thoracic curve and a left-sided lumbar curve measuring 46° and 51°, respectively (**Figure 3**). Repeated imaging 4 months later showed progression to 56° and 57°, respectively. A genetic consult ruled out Marfan syndrome (Ghent score, 1) and Ehlers-Danlos syndrome (Beighton hypermobility score, 3). No mitral valve prolapse or aortic root dilation were noted on the echocardiogram

score, 5). No mitral valve prolapse or aortic root dilation were noted on the echocardiogram.

The patient received a diagnosis of adolescent idiopathic scoliosis and underwent a posterior spinal fusion with instrumentation.

Figure 3. *Posteroanterior radiograph of the spine.*

Discussion. Scoliosis, characterized by rotation of the vertebrae by 10° or more, affects 1% to 3% of children between age 10 and 16 years.[1] Idiopathic scoliosis accounts for 65% of all cases; the remainder of cases are congenital or are secondary to other causes. It is a diagnosis of exclusion. Genetic and environmental factors may play a role, and at least 1 gene, *CHD7*, has been associated with the idiopathic form.[2] Girls and boys are equally affected with curves of less than 10°, but 10 times as many girls have curves of 30° or more.[3]
Screening includes inspection of the back and a forward bend test (the Adams test). Curves of less than 10° are normal variants, but if abnormalities are noted, weight-bearing full-spine posteroanterior radiographs with measurement of the Cobb angle are indicated.

Approximately 90% of curves are mild and require only observation. Growing children with curves of less than 25° need follow-up imaging every 6 months until maturity, and those with curves between 25° and 45° usually require bracing. Curves of more than 50° progress by approximately 1° per year, and curves above T12 are more likely to progress.

Operative management is indicated for immature patients with curves of 40° to 45° and mature patients with curves of more than 50°. Exercise, electrical stimulation, and manipulation are ineffective and should be avoided. Possible postoperative complications include misplacement or migration of a pedicle screw (15.5%), pseudarthrosis (5%), deep wound infection (5%), and delayed wound infection (2.5%).[4]

Outcome of the case. Although the patient is sedentary, if she desires to pursue sports activities, most surgeons allow noncontact sports by 3 months and contact sports between 6 months and 1 year after surgery. Return to collision sports is controversial.[5]

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