Scoliosis in Children and Adolescents

An adolescent female has a right thoracic idiopathic scoliosis. Her rib prominence is most obvious upon her bending forward. The radiograph demonstrates a right thoracic scoliosis

Description

Here are some facts you should know.

Scoliosis:

- Is a sideways curvature of the spine that makes the spine look more like an "S" or "C" than a straight "I".
- Can cause the bones of the spine to turn (rotate) so that one shoulder, scapula (wingbone), or hip appears higher than the other.
- Can run in families. However, the exact cause of most cases of scoliosis is not known (idiopathic).
- Can occur at any age. Adolescent idiopathic scoliosis occurs after the age of 10. It is the most common type. Infantile scoliosis occurs in children less than 3 years old. It may result from a birth defect, disease of the nerves and muscles (such as muscular dystrophy or cerebral palsy), injury, infection or tumors. Juvenile scoliosis occurs in children between the ages of 3 and 10 years old. It is not common.
- Does not usually cause any pain.
- Small curves occur with similar frequency in boys and girls, but girls are more likely to have a progressive curve that will require treatment.

Diagnosis of scoliosis:

- Requires a thorough medical history to determine if any other problems may be causing the spine to curve.
- Includes a comprehensive physical examination. The doctor will ask your child to bend forward, which will show any deformities. He or she will also check for any limb-length discrepancies, abdominal muscle strain or other potential causes.
- Is confirmed with an X-ray of the spine. The physician will measure the degree of the curve as shown on the X-ray. The type of treatment required depends on the kind and degree of the curve, the child's age, the number of years of growing until the child reaches skeletal maturity and the type of scoliosis.

Scoliosis by definition is curvature of the spine in a side to side fashion when you look at someone from the front or the back. Scoliosis is a descriptive term not a diagnosis. In more than 80% of the cases of scoliosis a specific cause is not found and these are termed idiopathic scoliosis. (of undetermined cause). This is particularly so in scoliosis seen in young girls.

Other conditions known to cause spinal deformity include neurological conditions, genetic conditions, trauma, spinal cord injuries amongst other things. No evidence that scoliosis comes from carrying heavy bags, athletic involvement or the way you sleep at night time. A minor leg length discrepancy also does not cause scoliosis.

Initial imaging will include x-rays which are taken from the front and side and may also include x-rays taken bending to the left and to the right. An MRI scan or a CT scan may be used particularly if an abnormality to one of the underlying vertebrae is the cause for your scoliosis.

The most common type of all the scoliosis is adolescent idiopathic and is seen in equal frequency in girls and boys when the curves are small. Girls for unknown reason have a slightly higher risk for the curve getting worse as they get older. The way your lungs work are not impeded with curves in the lower part of your lumbar spine and significant changes in lung function are not seen until curves in the upper part or thoracic spine reach 70º or more.

If left untreated, scoliosis exceeding 50 degrees can be problematic in the long-term. Progressive deterioration of the curve can occur, which in some cases can lead to diminished lung capacity and the development of restrictive lung disease. Cosmetic concerns are significant to many patients. The incidence of back pain among patients with scoliosis approximates that of the general population.

Treatment Options

Treatment for scoliosis may be as simple as purely observation with sequential x-rays to ensure the curve does not progress. Depending upon the time at which the diagnosis is made the nature of the curve and the maturity of the individual patient bracing may be appropriate. The primary goal of brace management is to stop the curve progression.

If bracing fails or the curve progresses markedly surgical intervention may be considered. The decision to do surgery in someone with scoliosis is made based upon the size of the curve, the location of the curve, the cosmetic deformity of the individual, the symptoms the individual has and the likely natural history of a curve of that size as the person grows into adult life.

The types of surgery that can be done are traditional surgery which is done through the back and also anterior surgery which is done through the chest wall. Both have excellent track records and excellent results.

Observation: This option is appropriate when the curve is mild (less than 20 degrees) or if the child is near skeletal maturity. However, the doctor will want to recheck the curve on a regular basis to see that it is not progressively getting worse. You may be asked to return every 3 to 6 months for re-examination. Most cases of scoliosis referred through school screening will fall into this category.

Bracing: The goal of bracing is to prevent curves from getting worse. Bracing can be effective if the child is still growing and has a spinal curvature between 25 and 45 degrees. There are several types of braces, most being underarm. Your orthopaedist will recommend a brace and tell you how long it should be worn each day. Wearing a brace does not affect participation in sporting activities. Time out of brace is allowed for these activities.

Treatment Options: Surgical

Surgery: If the curve is more than 45 degrees and the child is still growing, the doctor may recommend surgery. If growth is finished, surgery may still be recommended for curves that exceed 50-55 degrees. Before the operation, your child may be asked to donate blood (which will be used during the

surgery as needed). The surgery may require a bone graft from the hip, ribs or a bone bank. A series of rods, hooks, screws or wires are used to straighten the spine. Following surgery, patients are walking without a brace by the second or third day, are discharged from the hospital within a week and can rapidly resume their daily activities. A return to some sports is possible in 6 to 9 months.

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