



POSNA

The Core Curriculum

Scoliosis (Infantile and Juvenile)

Objectives

1. Describe age of presentation, clinical exam, and natural history of congenital scoliosis
2. Discuss treatment of infantile scoliosis
3. Define juvenile scoliosis
4. Discuss evaluation of a juvenile curve that has progressed rapidly
5. Discuss treatment of juvenile scoliosis
6. Describe a simple method for calculating remaining spinal growth for the growing child

Discussion points

1. How does one measure and apply Mehta's angle?
2. What problems are encountered with surgical management of infantile and juvenile scoliosis?

Discussion

Infantile scoliosis is defined as scoliosis appearing before age 3; and juvenile, between age 3-10. Infantile scoliosis is somewhat more common in Europe than North America for unknown reasons. It has been associated with physical findings of intrauterine molding, such as plagiocephaly, rib molding, and contracture of the hips. However, the scoliosis is usually not discovered until after 1 month of age, casting some doubt on the contribution of intrauterine molding. A variable number of infantile curves spontaneously resolve, averaging about 50% in several reported series. The rib-vertebral angle, described by Mehta, has been of value in determining risk of progression for infantile curves. This angle is determined by measuring the angles of ribs to the vertebral endplates on the convex and concave sides of the curve; and then subtracting the convex value from the concave value. Small amounts of curvature (under 20 degrees) and relatively small rib vertebral angles are characteristic of a benign curve, which needs no treatment. For progressive curves, serial casting is necessary followed by brace treatment. If correction is maintained, the brace can be weaned. If not, continued bracing is necessary.

Juvenile curves tend to have the same curve patterns as adolescent idiopathic scoliosis. Progression is common, although not inevitable. Left thoracic or lumbar curves tend to progress less. It is important to perform a thorough neurologic exam as some curves may be secondary to other pathology such as syringomyelia. Sudden increase in curvature should also alert the examiner to the possibility of intraspinal pathology. Bracing is the first line of treatment, occasionally serial casting may be a helpful first measure. The rib vertebral angle may be helpful in determining the quality of response to bracing.

If the curve progresses to greater than 50-60 degrees, and is becoming structural, surgical stabilization is indicated. The procedure performed depends on the age of the patient and growth remaining of the spine. Obviously, definitive spinal procedures performed with considerable growth remaining will have undesirable side effects related to asymmetric spinal growth (crankshaft phenomenon), which can become harder to treat than if nothing were done. The usual sequela is further anterior growth against a tethered posterior spine, resulted in a snakelike anterior deformity. A rough but useful formula for remaining spinal growth is 7mm x number of spinal segments x years of remaining growth. Procedures employed include instrumentation without fusion for younger children, and/or anterior and posterior fusion for older children. Technical problems are frequent after surgery, especially with the instrumentation without fusion group, so the longer surgery can be postponed by bracing, the fewer growth related complications remain. A recent report suggests improved maintenance of correction in immature patients with more rigid posterior instrumentation.

References

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