THORACOLUMBAR KYPHOSIS AND LUMBOSACRAL HYPERLORDOSIS

IN ACHONDROPLASTIC CHILDREN

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THORACOLUMBAR KYPHOSIS

Natural History

The thoracolumbar (TL) kyphosis is present at birth, or is noticed within the first 6 months in about 95% of newborns. The curve becomes more pronounced and gains its maximal expression when the child becomes a sitter, between 6 and 18 months of age (Fig. 1a,b). It noticeably improves or even disappears in most children with the advent of stance and gait, simultaneously with the development of lumbosacral lordosis. Some infants, however, develop vertebral wedging of the apical vertebra that insures the permanence of a residual structural curve. Many other achondroplasts adopt a kyphotic posture while sitting throughout life even if they do not have a structural, clinically appearing kyphosis when standing.

Radiologically, the thoracolumbar kyphosis of the newborn extends from about T8 to L4 (apex at T12-L2) and ranges from 15-25 degrees (Fig. 2). The nuclei of ossification of the vertebral bodies included in the curve are invariably rectangular, of a uniform size and in proper alignment on the lateral view.

During the sitting phase the curve increases to between 60-70 degrees or more (Fig. 3). The lower limit of the curve changes from L4 to L3 and the upper limit from T8 to T10/11 as soon as the child begins to stand. L2 usually becomes the apical vertebra, sharing this rôle with L1. Anterior wedging of the apical vertebra L2/1 usually develops during this phase. Once established, it is responsible for the persistence of the kyphotic curve and appears to play a major rôle in the pathogenesis of symptomatic spinal stenosis in later life.
Fig. 1. a) 4-week-old infant with connatal kyphosis (without vertebral wedging).
   b) At 10 months, with progression of a curve that resists full manual correction.

Fig. 2. Lateral appearance of achondroplastic spine at 4 weeks.