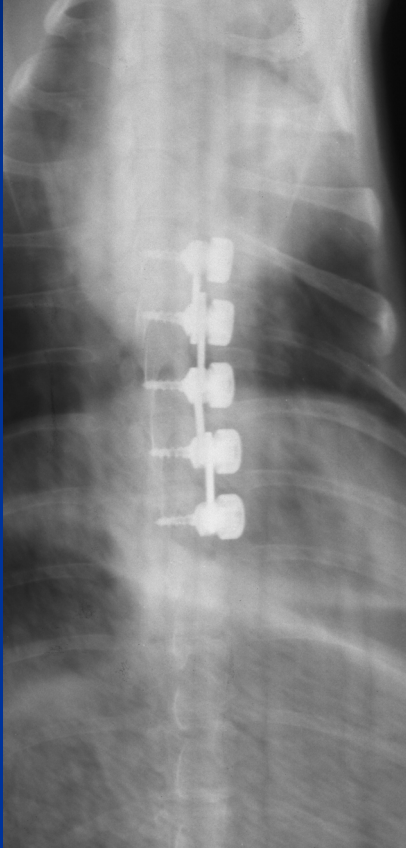


Spine Growth Modulation in the Immature Goat

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Introduction



- A growth modulation device (GMD) was developed to explore the hypothesis: higher compressive forces induced by the GMD between intervertebral regions lead to changes of vertebral endochondral ossification.

Purpose

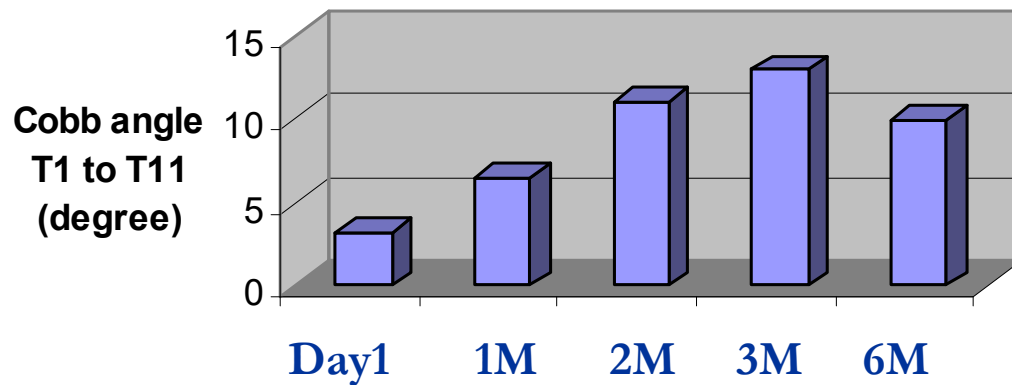
- To evaluate the effect of the GMD on the spine segments by histological and radiographic means
- To compare the heights of the chondrocyte zones, disc structure, and bone and cartilage density between the instrumented and uninstrumented side of the vertebral body

Methods

- The four skeletally immature goats (two-month-old) were approached via a standard thoracotomy from T6 to T10.
- The right side of the spine was exposed and instrumented with the GMD.
- One goat was sacrificed at 1 month, 2 months, 3 months, and 6 months following spinal surgery, respectively.
- Histomorphometry of the intervertebral disc, vertebral body and endochondral plate were analyzed.

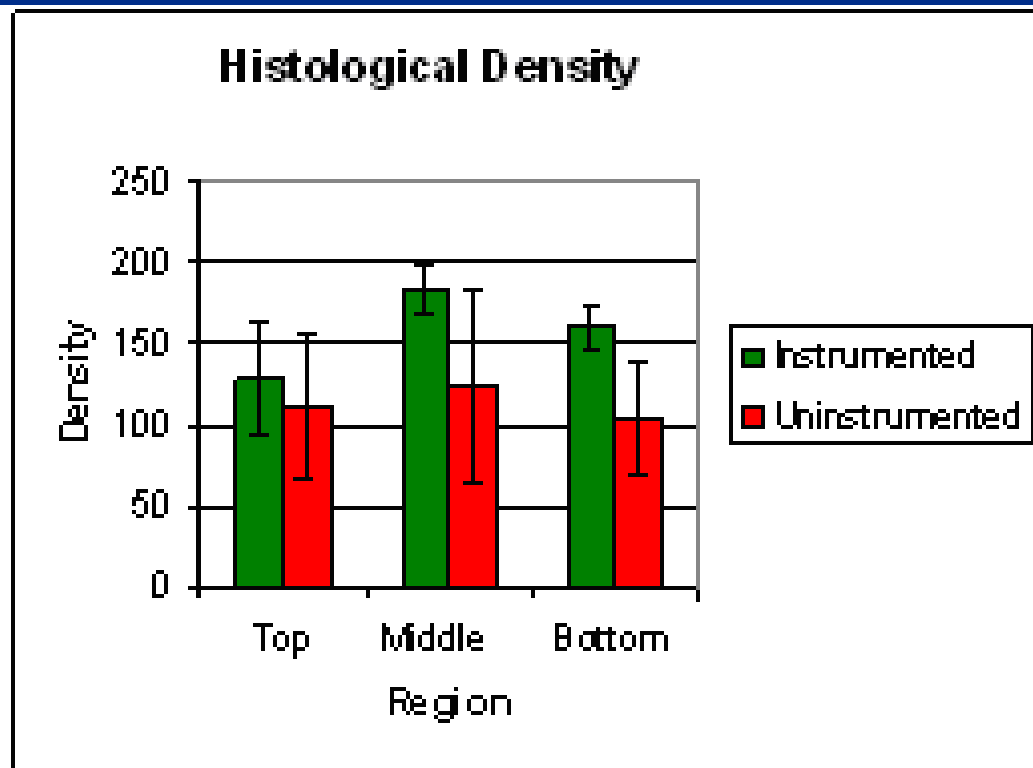
Results

Cobb angle in AP from T1 to T11



- The average Cobb angle (T1-T12) increased from 3° to 10°.
- The length (T6-T10) increased from 8.9cm to 12.6 cm.

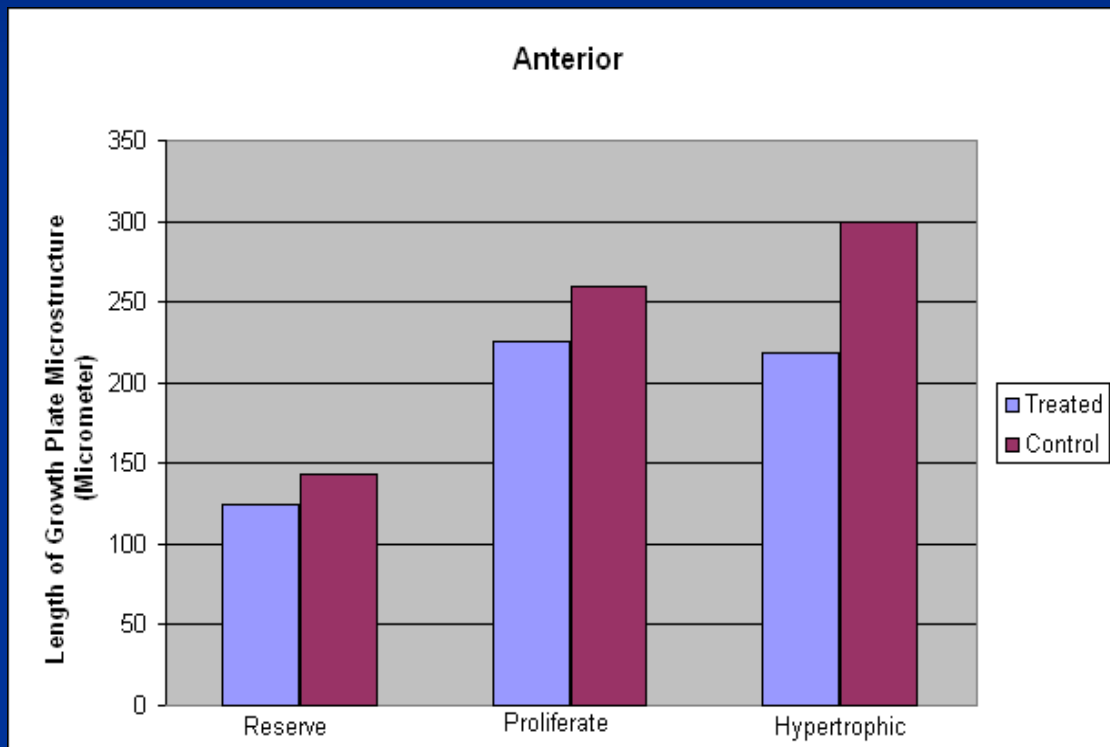
Results



(Cartilage)

- Bony and cartilage density was greater on the instrumented side at 6 months post-surgery

Results



- The heights of three endochondral zones were reduced on the instrumented side (13%-23%), especially on the hypertrophic zone.

Conclusion

- As a result of the short-term study, the GMD yields an appreciable impact on the bony and cartilage density, and endochondral ossification height.