

# Scoliosis Induced by Radiofrequency Ablation in Growing Pigs

## Free Paper # 22

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# Free-Paper #22

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# Introduction

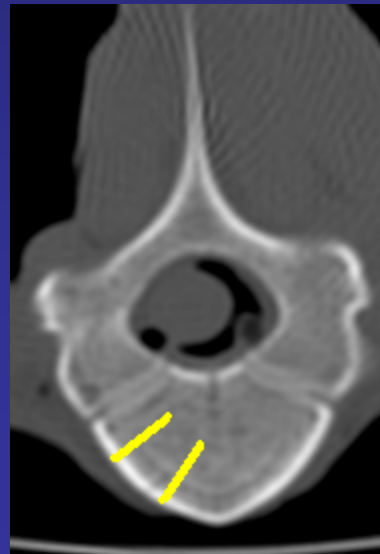
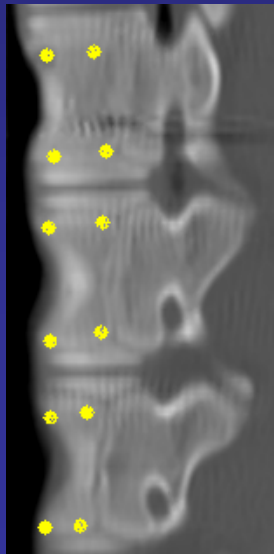
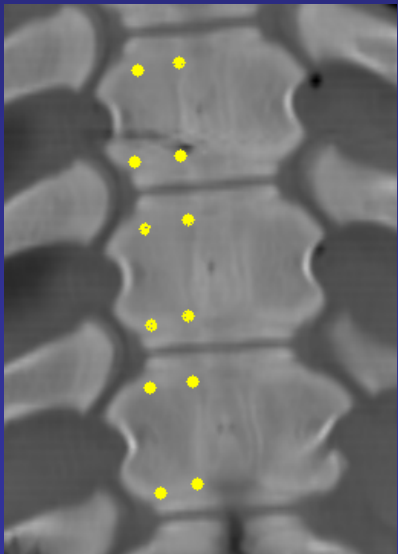
- The vertebral body growth may be strategically injured to create vertebral deformities in the immature spine.(1,2,3)
- With thermoablation by radiofrequency (RF) well-defined areas of necrosis may be induced in the bone and other tissues.(4,5)
- RF is potentially a good technique to modify the vertebral growth

# Objetives

- Evaluate the effectiveness of radiofrequency to produce structural alteration of the anterior annular synchondrosis
- Evaluate the morphological and histological changes produced by the application of radiofrequency on anterior annular synchondrosis unilaterally on the growing spine.
- Evaluate whether neurophysiological monitoring is possible during application of radiofrequency on the spine

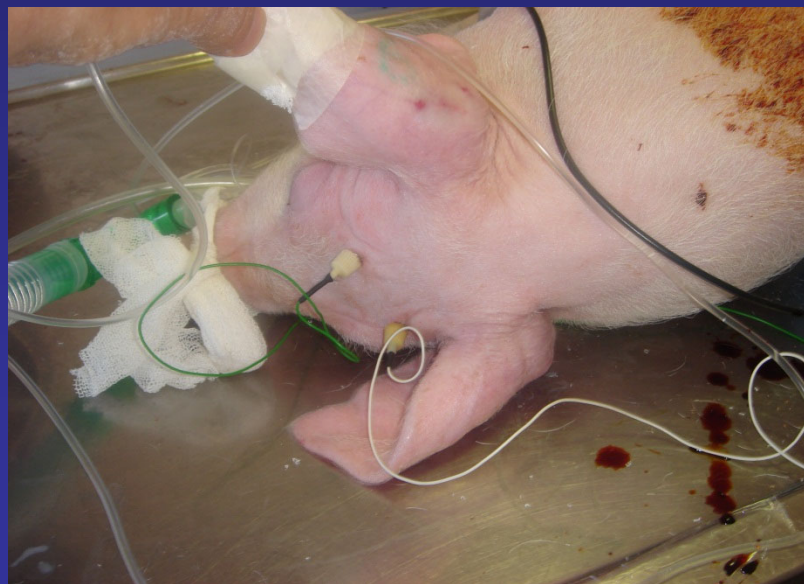
# Material and Methods

- Six 2-month-old pigs were divided into 2 groups A and B.
- Right thoracotomy T7,T8 without rib resection was performed.
- Adjacent to each annular synchondrosis 2 holes were drilled of 1mm diameter, 6mm deep on the right anterolateral face of T6, T7, and T8.
- Additionally, in group B a pulse of RF at 90 C for 90 seconds was delivered to each hole.



# Material and Methods

- MEP were monitored during each RF pulse.
- The animals were killed 6 months later.
- X-rays were performed before surgery and after sacrificing the pigs (A,B)
- The vertebral-costal block was removed for CT and histopathology (B)



# Results Group A

- None of the animals in group A developed significant curves, asymmetries, or vertebral rotation

Groupe A	Age Mths	Evol time Mths	Scoliosis Cobb	Kyphosis Cobb	Axial rot
Pig1	2	6	0	4	0
Pig 2	2	6	5	0	0
Pig 3	2	6	0	0	0

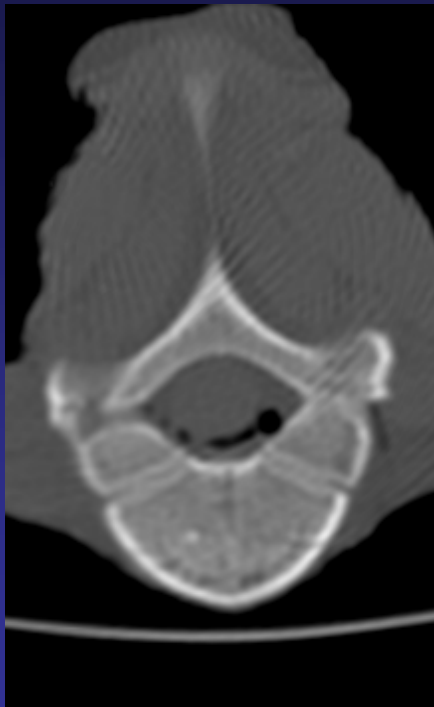
# Results Group B (RF)

- All animals developed scoliosis of the right concavity (mean 25.7)
- Kyphosis (mean 20)
- Axial rotation with rib depression on the right side ( mean 7.6).

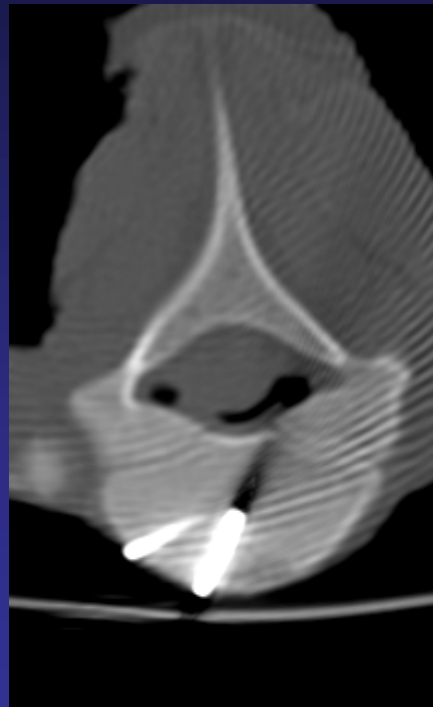
Groupe B	Age Months	Evol time Months	Scoliosis	Kyphosis	Axial rot
Pig 1	2	6	23	15	6
Pig2	2	6	24	20	10
Pig3	2	6	30	25	7



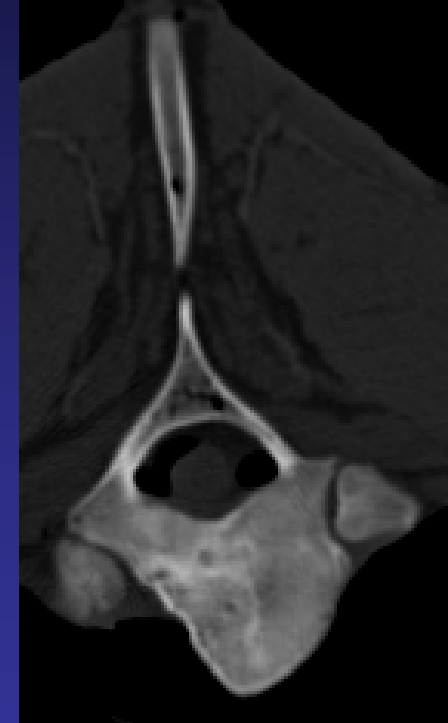
- All vertebral bodies treated with RF (group B) developed right anterolateral hypoplasia



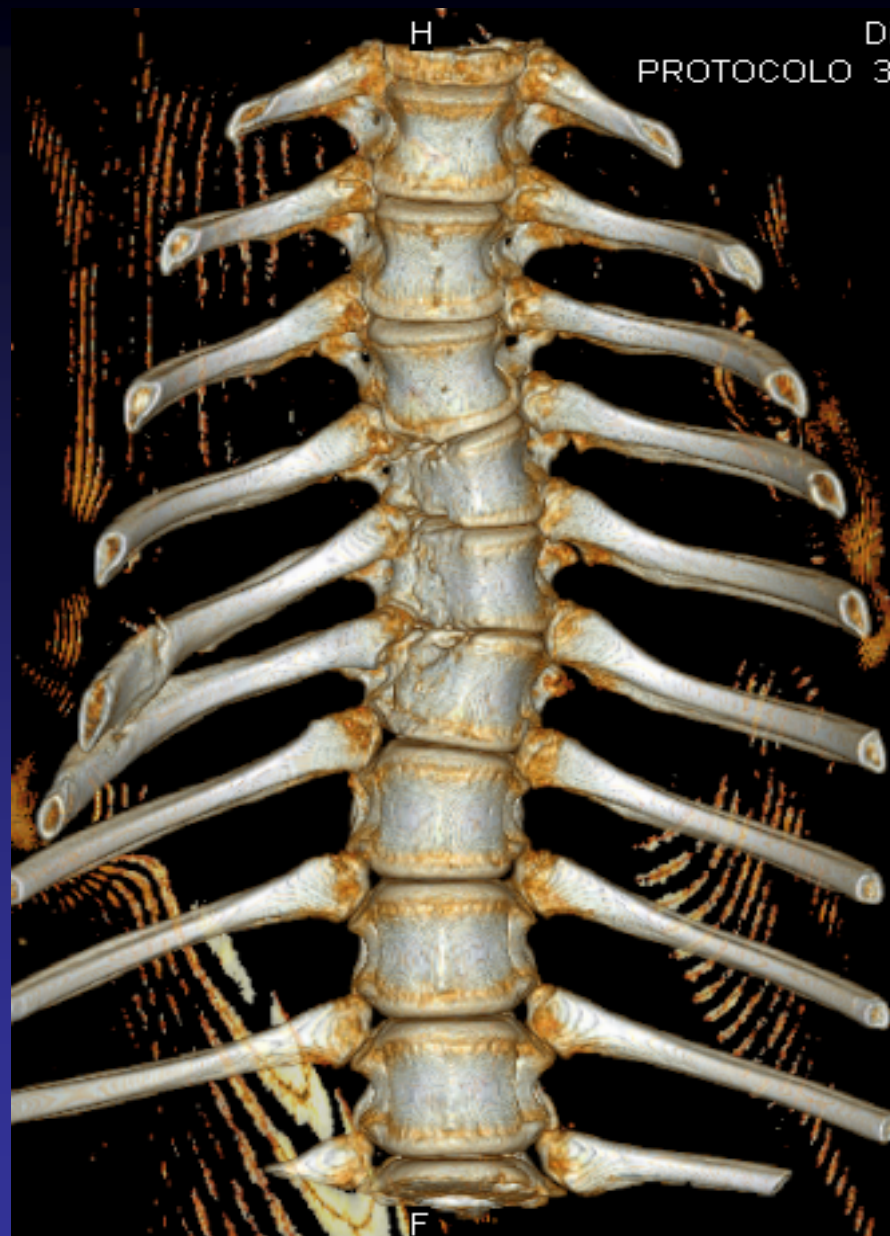
CT before RF  
Pig 17 Kg



CT RF electrode position  
Pig 17 Kg

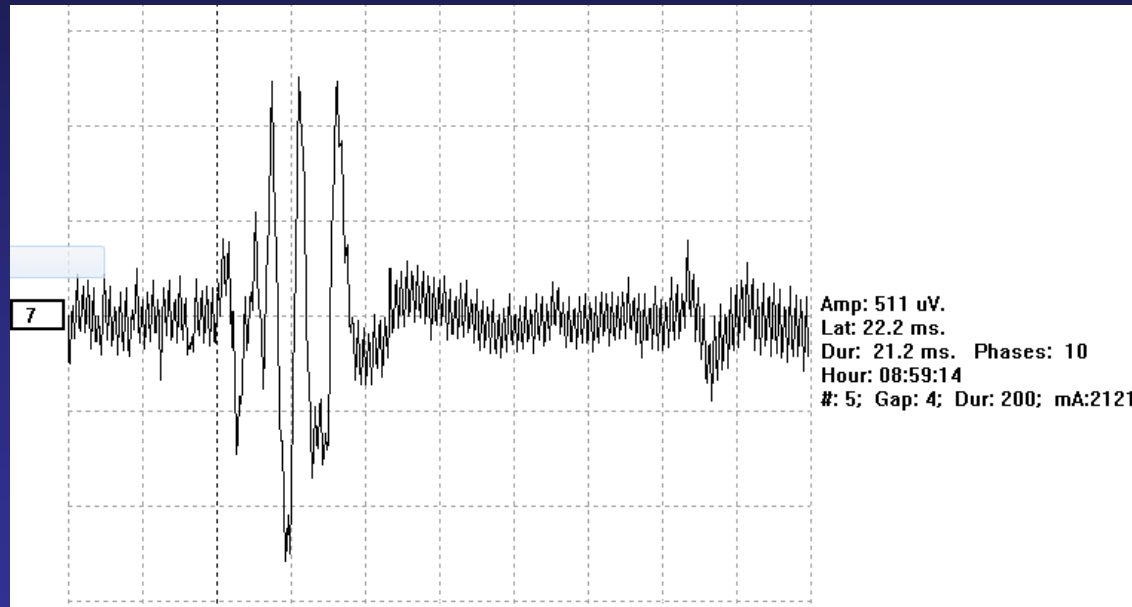


CT after 6 months  
Pig 70 Kg



3D CT SCAN SPECIMEN GROUP B

- Clear and continuous MEP recordings before, during, and after application of RF were obtained in all specimens



MEP during RF Pulse

# Conclusions

- Radio frequency is an effective method to produce structural alterations on vertebral annular synchondrosis.
- The asymmetric RF injury, induced scoliosis with the concavity and inward rotation to the side of the lesion, kyphosis, and asymmetric anterior hypoplasia.
- MEP can be well monitored during the RF pulse in the vertebral body

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