

Effects of the growing rod on the discs and facet joints of the unfused intermediate segments

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Disclosure

⇒ Gokhan Demirkiran

No disclosure

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No disclosure

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No disclosure

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No disclosure

⇒ Kenan Daglioglu

No disclosure

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K2M (b), DePuy (c)

Background

- ⇒ Clinical studies have shown
 - ⇒ GR preserves the normal growth potential of spine while controlling the deformity
- ⇒ However there are disagreements stating
 - ⇒ Distractions and/or relative immobilization
 - ⇒ Disc and facet joints of the intermediate spanned segments
 - Degeneration and/or spontaneous fusion

Aim

- ⇒ Is GR ending up with degeneration and/or fusion ?
- ⇒ Comparison of discs and facet joints' health in
 - ⇒ Control group (CG)
 - ⇒ GR group
 - ⇒ Instrumented fusion (IF) group

Material & Methods

- ⇒ IRB approved
- ⇒ Study granted by
 - ⇒ The Scientific and Technological Research Council of Turkey
 - ⇒ Hacettepe University Scientific Research and Development Office
- ⇒ 13 piglets (3 CG, 7 GR, 3 IF)
- ⇒ 10-14 weeks of age

Technique

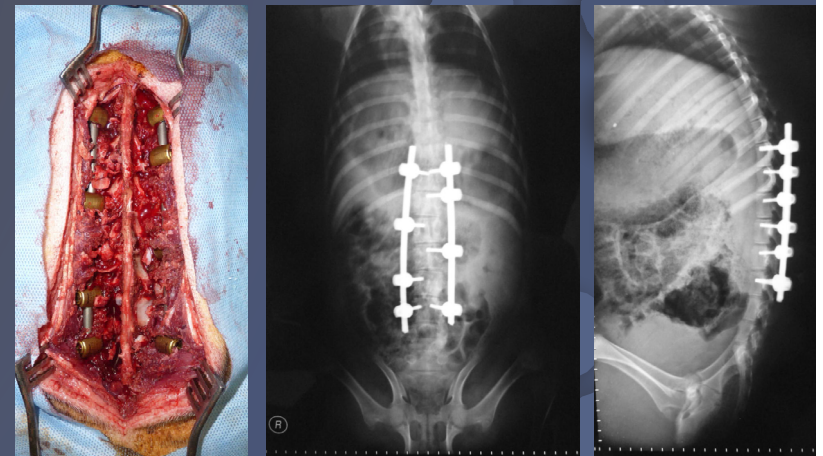
⇒ CG

⇒ Age matched healthy animal

⇒ IF

⇒ 6 levels fusion at TL spine with pedicle screws and local bone

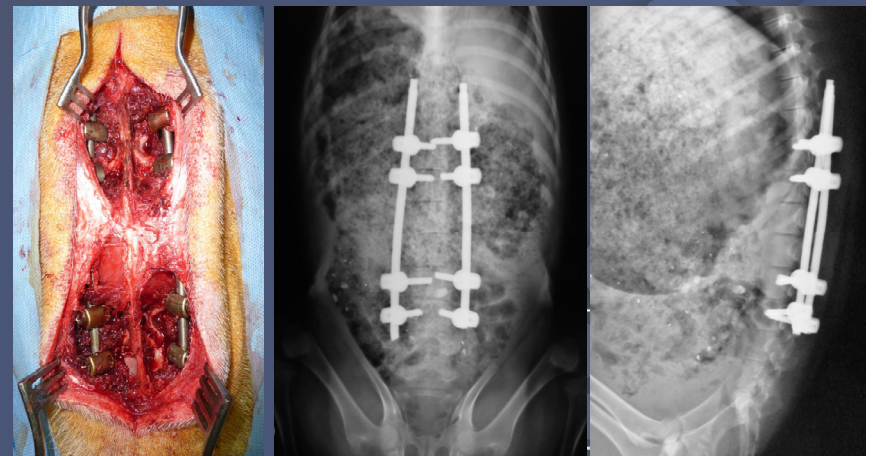
⇒ 4 months of follow-up



⇒ GR

⇒ After index surgery monthly lengthening of 5 mm monthly for 3 months

⇒ Same levels used with 2 spanned intermediate segments



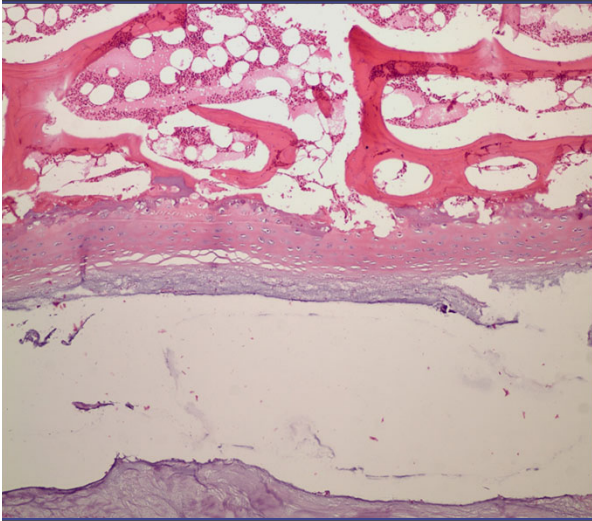
Material & Methods

⇒ Histological evaluation

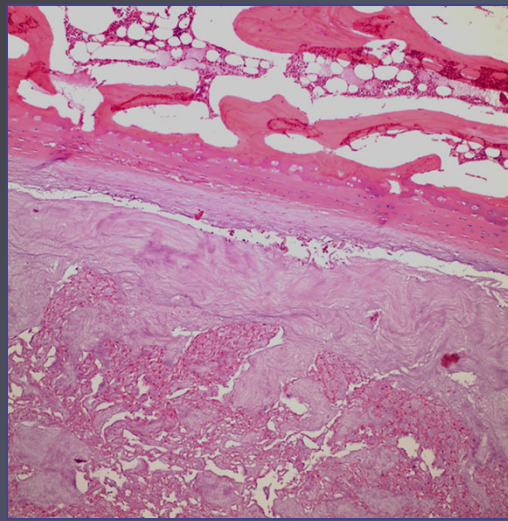
⇒ Intermediate discs and facet joints

⇒ Grading system → Gries et. al., Eur Spine J., 2000

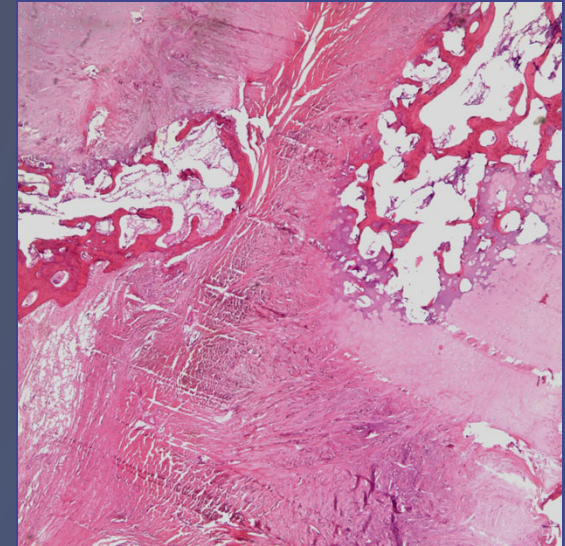
Results



Normal disc



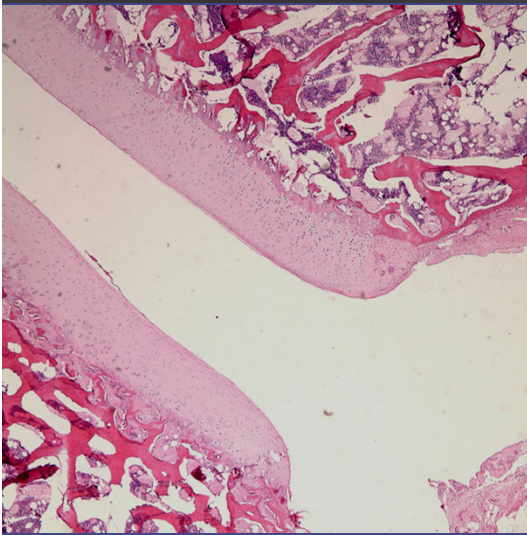
Near normal disc



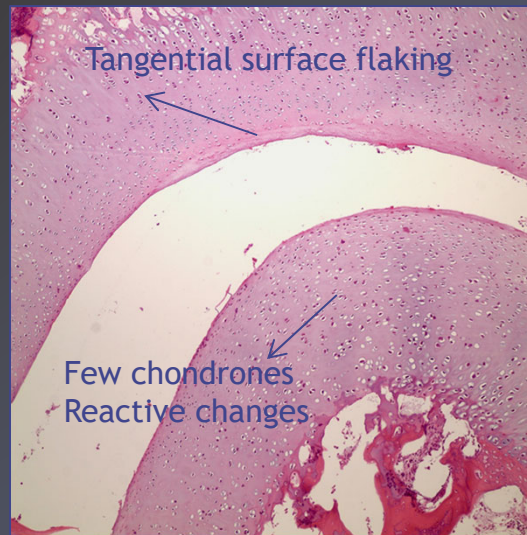
Fully degenerated disc

Histological Evaluation	CG (grade)	GR (grade)	IF (grade)	χ^2	p
Intermediate Disc	1.1333	1.7500	3.2941	31.59	0.00

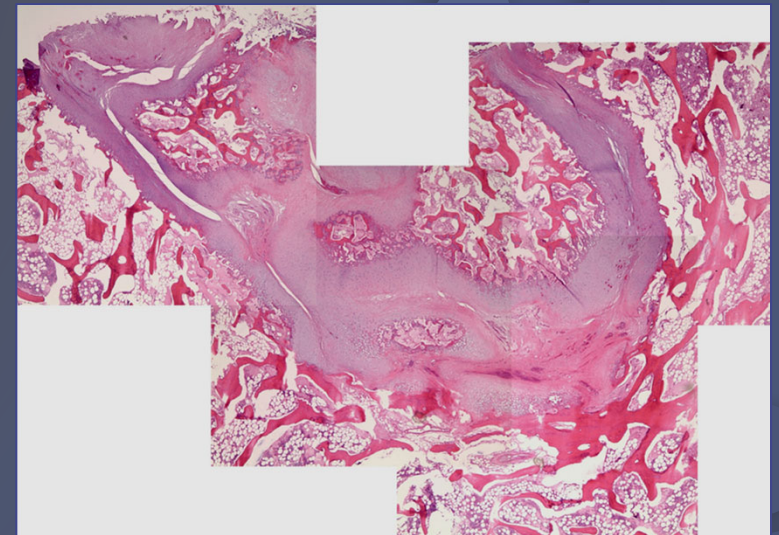
Results



Normal facet



Minimal degenerated



Fused facet

Histological Evaluation	CG (grade)	GR (grade)	Z	p
Intermediate Facet Joints	1	2	-3.523	0.00

Conclusions

- ⇒ Although some degenerative changes are observed in the intermediate discs when compared to normal spines
GR does not cause spontaneous fusion after multiple lengthenings
- ⇒ GR is closer to normal physiology
- ⇒ GR preserves the disc and facet joints of the intermediate segments
- ⇒ GR is a “fusionless” procedure