

Interspinous Process Implants of Metal Cause Wear of the Spinous Processes –

An Experimental Study and Clinical Cases

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BACKGROUND

There are few biomechanical studies on interspinous process implants

but none that have investigated the amount of wear caused to the spinous processes.

PURPOSE

To investigate the effect of repetitive loading of the interspinosus implant Aperius on the spinous processes in a biomechanical porcine model.

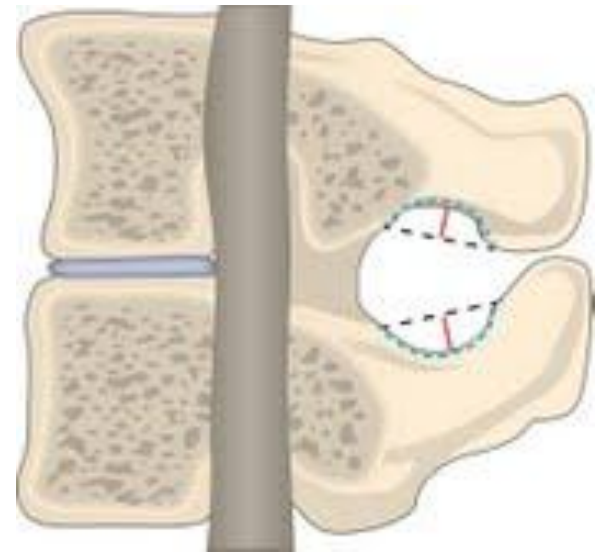
We also present 3 clinical cases operated with Aperius followed with X-rays and CT up to one year.

METHODS

4 lumbar spines from 6 months old porcines were divided into eight segments, which received interspinous implants.

The segments were then exposed to 20.000 cyclical loads where after the deformation (wear) of the segments was registered.

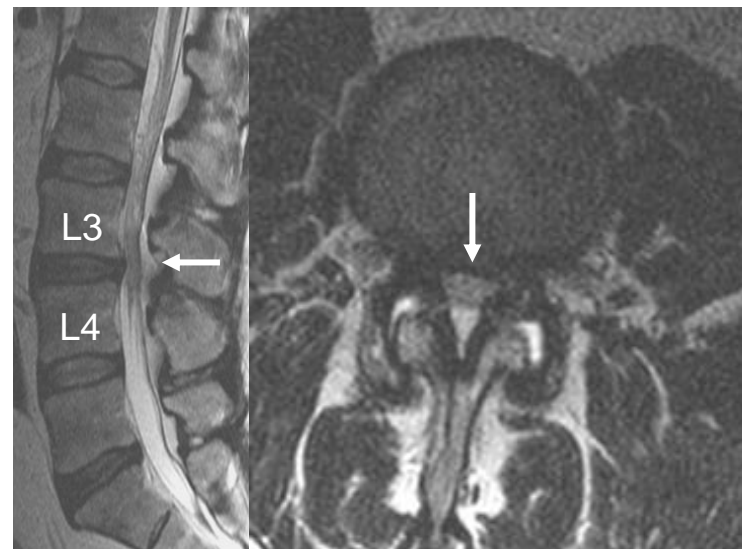
The wear of the spinous processes was measured in mm on the following CT-scan.



METHODS

Additionally, 3 patients with lumbar spinal stenosis treated with interspinous implants were followed between one and two years postoperatively.

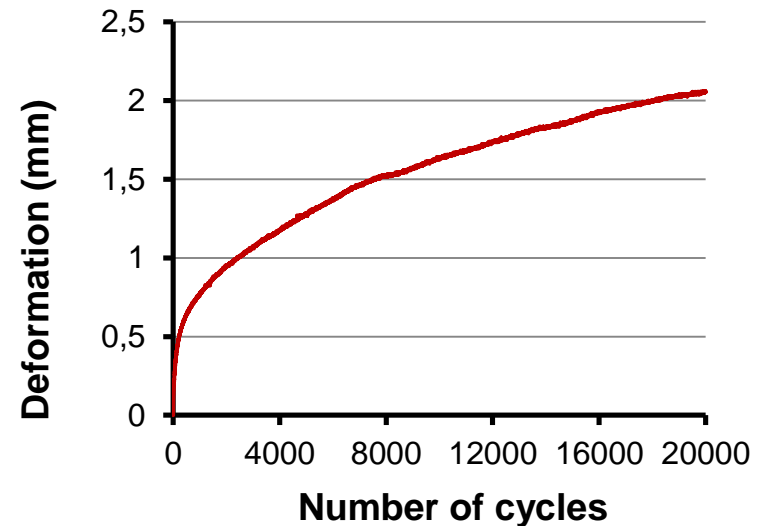
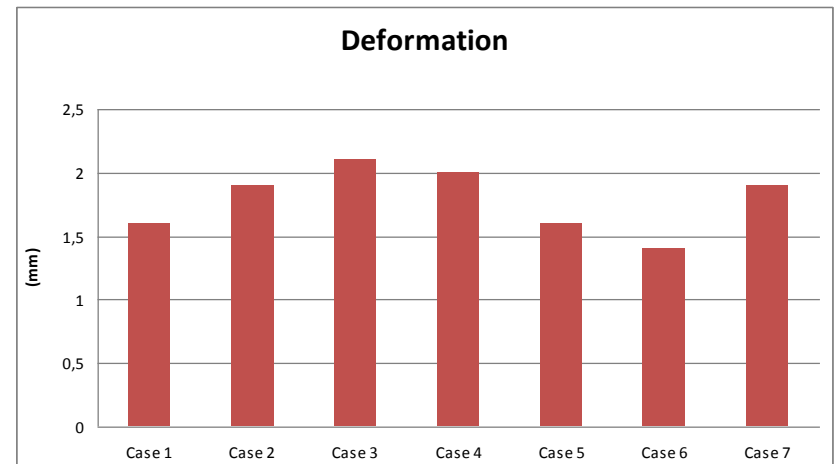
The wear of the spinous processes on CT-scans or X-ray were presented together with the clinical results.



RESULTS

The mean maximal deformation of all specimens was 1.8 mm (SD 0.25).

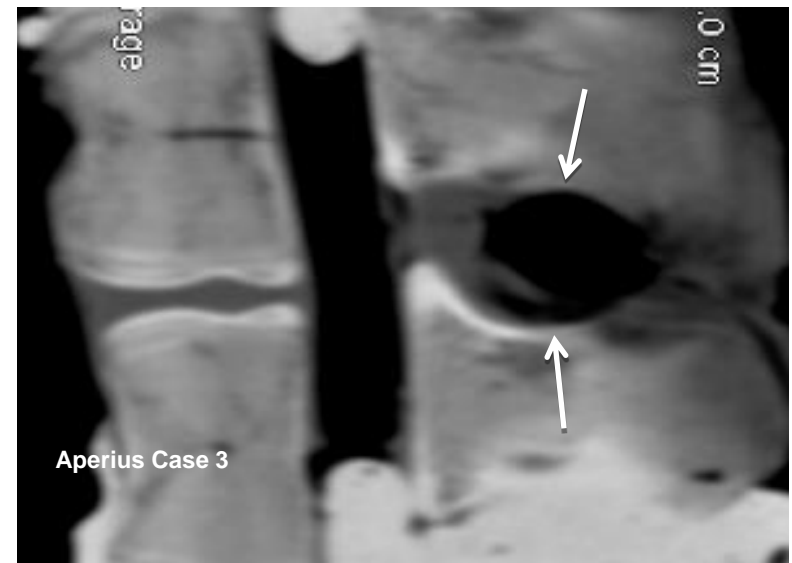
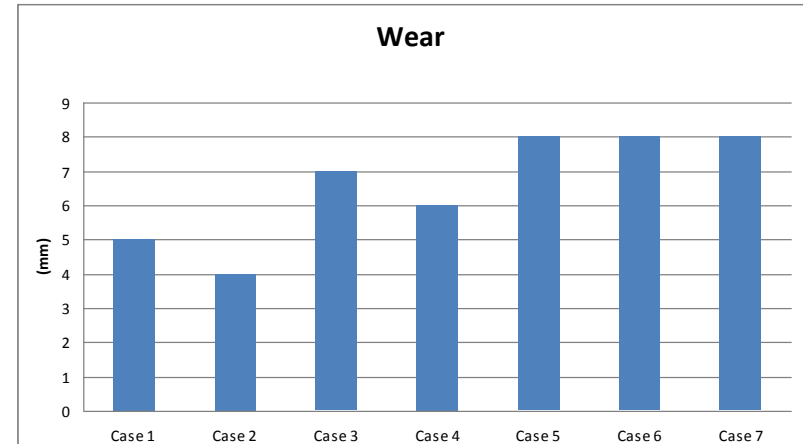
The largest deformation occurred in the first quarter of the loading (< 5000 cycles).



RESULTS

The mean wear of the spinous processes after loading was 6.57 mm (SD 1.62)

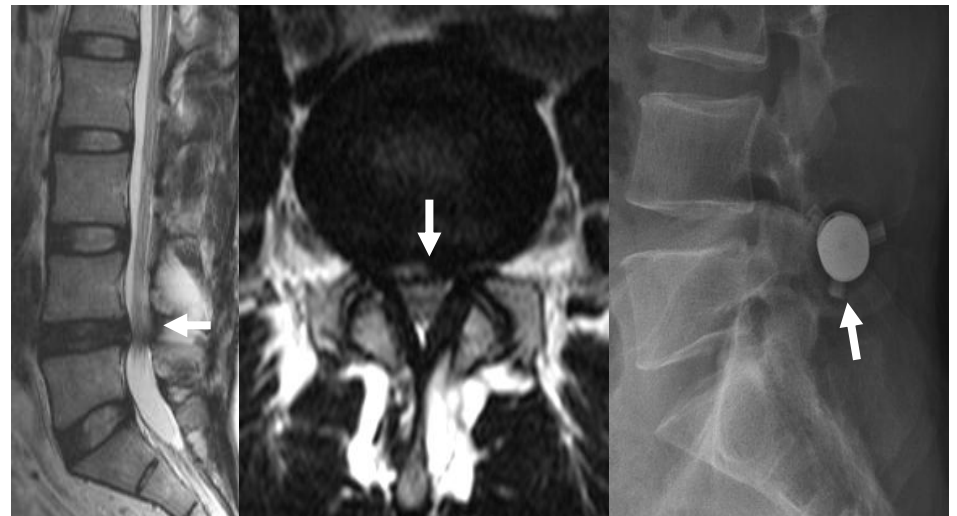
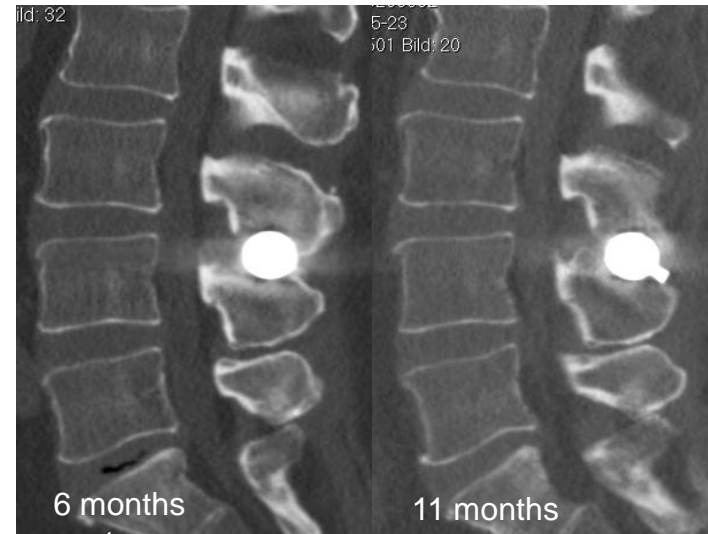
Wear of the spinous processes on CT examinations after loading.



RESULTS

Wear of the spinous processes was detected in the clinical cases already after 3 months postoperatively.

2 of the patients had recurrence of their symptoms and were planned for laminectomy.



CONCLUSIONS

- In an experimental biomechanical study under cyclical loading the interspinous titanium implant Aperius causes significant wear of the spinous processes.
- Wear of the spinous process is also present in clinical cases already at three months post-operatively.
- The clinical importance of these findings is still not clarified but indicates that the material the implant is made of is of importance for the clinical durability.
- Further clinical studies are needed

Potential conflict of interest disclosure

No conflicting interest for any author