The interspinous implant according to LifeSpine: **Aileron**

Dario Bergadano, Myrmex SpA
• Implant goal: Minimize movements

• Consequence (wished): Interbody fusion
Basic biomechanical goal:

To have, after implantation, a SUFFICIENT stability to let fusion happen

(ligaments and muscles)
Basic surgical goal:
The device should make surgery:

- Rapid
- Reduced blood loss
- Reduced radicular risk
- Reduced vascular risk (anterior)
- No fluoroscopy
Advanced biomechanical goal:

- Preservation of supraspinous ligament as contribution to stability
- Insertion AS ANTERIOR AS POSSIBLE
  - (closer to instantaneous rotation axis)
  - (shorter lever arm)
How does stabilization happen?

- In extension, through a mechanical stop
- In flexion, through friction on lateral surface of interspinous process (+ spikes)
(Bio)mechanical validation

- Karahalios et al., *J. Neurosurgical Spine*, 2010

Biomechanics of a lumbar interspinous anchor with anterior lumbar interbody fusion

Laboratory investigation

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### Flexion: [$^\circ$]

- ISA only: 0.92 0.60
- ISA+ALIF: 0.45 0.23
- PS bilat+ALIF: 0.75 0.40
- (normal): 5.13 1.13

### Extension: [ ]

- ISA only: 1.60 0.48
- ISA+ALIF: 0.51 0.21
- PS bilat+ALIF: 1.54 0.77
- (normal): 4.93 1.18
(Bio)mechanical validity...

... depends on surgical performance, but also on device accuracy.

Fusion may take place...

Boestman et al., *Posterior final fusion using internal fixation with the Daab plate*, *Acta Orthop Scand*, 1984


Fidler MW, *Spinal fusion: a combined anterior and supplementary interspinous technique*, *Eur Spine J* 6, 1997

Wang JC et al., *Comparison of CD Horizon Spire and pedicle screw fixation after anterior lumbar interbody fusion*, *J Neurosurg Spine*, 2006

... but it’s not guaranteed! (adjacent levels)
Grazie

per la cortese attenzione.

Dario Bergadano