

## Poster #776

Endplate anatomical restoration may reduce adjacent fracture occurrence when using a new cranio-caudal expandable implant for Vertebral Compression Fracture treatment.

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# Background & Purpose

*« Depression of the fractured endplate alters the pressure profile of the damaged disc resulting in increased compressive loading of the anterior wall of adjacent vertebra that predisposes it to wedge fracture »*

*Tzermidianos, Eur. Spine J., 2008*

**PURPOSE** = Determine whether the adjacent vertebral fractures occurrence might be influenced by the anatomical restoration of the endplates

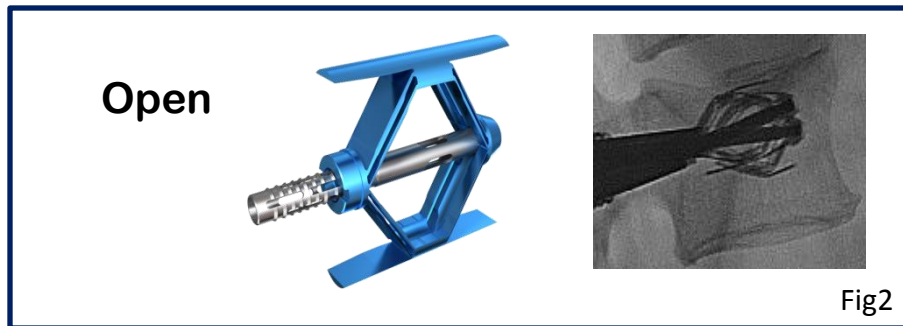
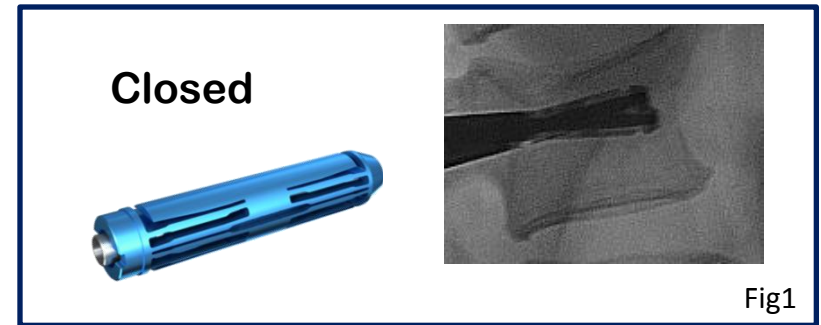
# Material & Methods (1/4)

- 134 patients (mean age 61yo, 76 Female/58 Male) with Vertebral Compression Fractures were enrolled prospectively in a European multicentric observational study. Mean fracture age was 32,4 days at the time of surgery.

<b>VCF Etiology</b>	<b>Fracture type</b>	<b>Fracture classification (for traumatic only)</b>
45 (osteoporotic)	44 (Biconcave)	50,4% (A1)
86 (traumatic)	67 (Wedge)	20,7% (A2)
3 (tumour)	37 (Crush)	28,9% (A3.1)

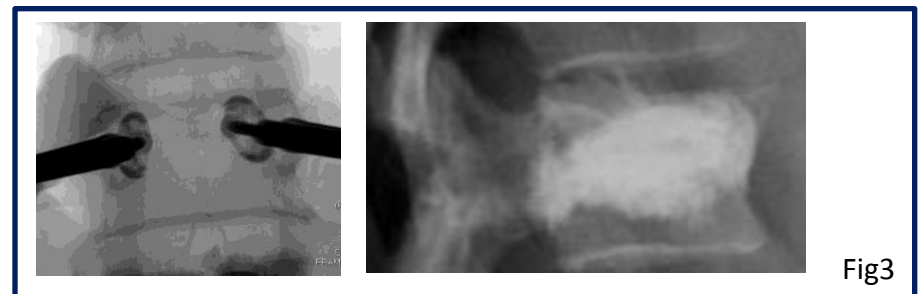
# Material & Methods (2/4)

Surgical treatment has consisted in placing one SpineJack® (in its closed position) via each pedicle under fluoroscopic guidance (fig1).



Then, they were both expanded (fig2) in a fully controlled manner to reduce the fractured vertebral body.

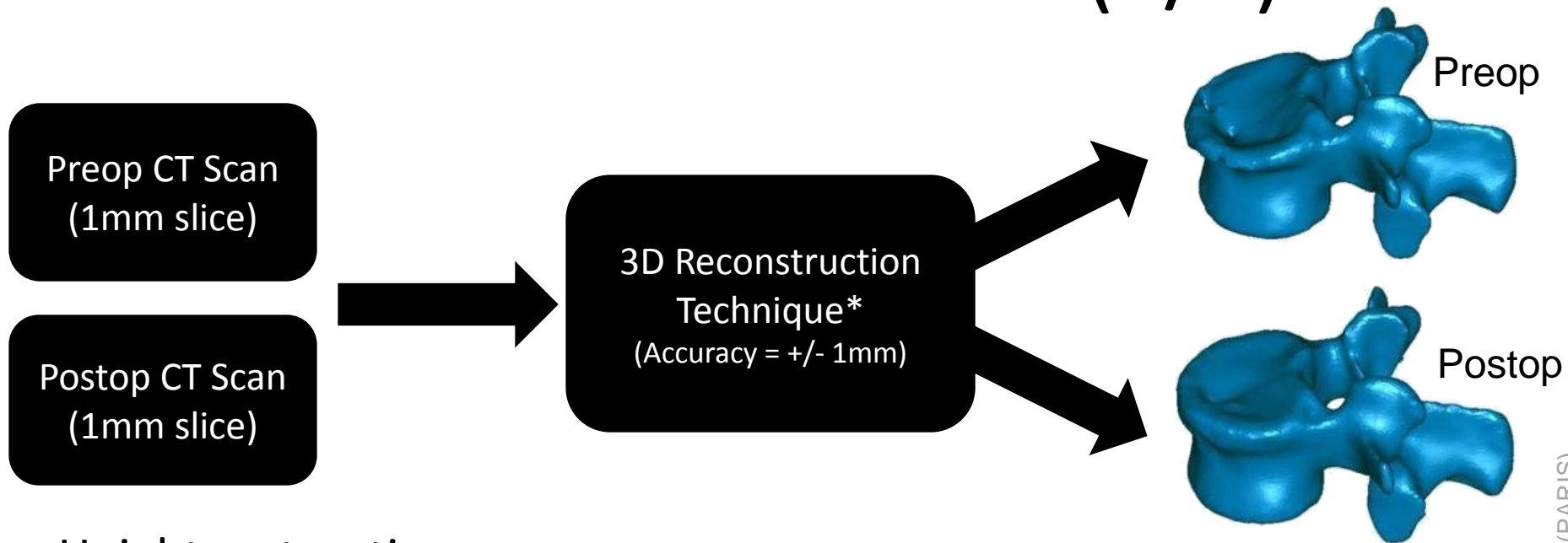
Cement was injected afterwards directly into the implant (fig3) to stabilize the reduction without losing any correction.



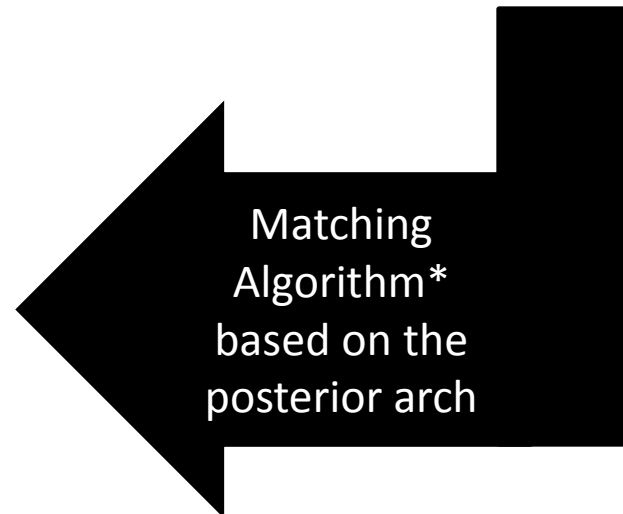
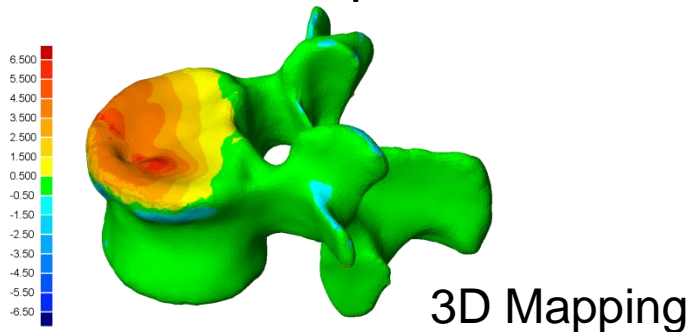
# Material & Methods (3/4)

- Radiological parameters calculations were made using CT-Scan 3D reconstructions and a specific comparison algorithm developed by an external laboratory (LBM/ENSAM – ARTS – PARIS) allowing thus to compare vertebral local kyphosis angle and vertebral body shape changes (including endplates).
- Adjacent fractures occurrences were registered thanks to FuP visits

# Material & Methods (4/4)



Height restoration  
Traumatic kyphosis reduction  
Vertebral endplate restoration



# Results

- Anatomical endplate restoration was achieved with 92% of vertebral kyphosis angle reduction and up to 10,8mm of height increase in the anterior part of the vertebral body.

- Adjacent fractures

	@ 6 month FuP	@ 12 month FuP
# of patients	34	17
# of adjacent fractures	2	0
Rate @1year FuP	3,9%	

# Discussion

- Adjacent fractures rates commonly reported for :
    - Percutaneous vertebroplasty : between 8 and 52%
    - Balloon kyphoplasty : between 3 and 29%
    - Conservative Therapy : 19,2%
- Movrin, Arch. Orthop. Trauma Surg., 2010*
- With the SpineJack<sup>®</sup>, the rate of adjacent fractures is only 3,9% (i.e. much lesser than with other

# Conclusion

- Encouraging results with the SpineJack<sup>®</sup> for:
  - Anatomical restoration of the vertebral body
    - Endplates
    - Cortical ring height
    - Vertebral kyphosis reduction
  - Lower rate of adjacent fractures when compared to conventional treatments
- Further and longer-term studies will be necessary to confirm this.

# Disclosures

D Noriega – Valladolid – SPAIN (b,e)

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*(a) grant/research support*

*(b) consultant*

*(c) stock/shareholder*

*(d) royalties*

*(e) other financial report*