It is common practice for a fracture of any weight-bearing joint to first be reduced, then stabilised. The concept of SpineJack® is to achieve a biomechanical restoration to allow early mobilisation and weight bearing.

Anatomical reduction means restoration of the geometry of the whole vertebral body, that is, the cortical rings and endplates. Anatomical restoration consists of achieving sagittal and coronal balance; the key for kyphosis management and consequent adjacent fracture avoidance.1,2,3,4,5,7

Vertebral endplate restoration has been described as having a positive influence on disc creeping, disc degeneration, compensatory curvatures or facet joint arthritis.1,6,8,9,10,11

Several clinical and epidemiological studies have shown a correlation between vertebra deformation and clinical problems such as post-traumatic kyphosis, which has been depicted as a serious post-traumatic deformity.2,12 Within this context, Vexim has designed the SpineJack® implant to provide clinicians with a fully controlled and comprehensive solution for Vertebral Compression Fractures treatment enabling first, an anatomical reduction, and second, a safe stabilisation.
Controlled Anatomical Restoration

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“Bring clinically and scientifically proven solutions to minimally invasive treatment of patients suffering from spinal trauma disorders”
Anatomical Restoration

To achieve anatomical restoration after a vertebral compression fracture, the following should be considered:

- Controlled uni-directional cranio-caudal expansion to restore sagittal and coronal balance
- Adaptation of implant’s expansion to restore **coronal angulation**
- Adaptation of implant’s positioning for **endplate restoration**

**Back in Shape**

AN OVERALL ANATOMICAL RESTORATION

Effective restoration measurement

The restoration capability of SpineJack® has been proven using 3D reconstructions of pre and post-op CT scans. The superimposition of these images allows precise measurement of the vertebral body’s anatomical restoration.

3D mapping with colour scale allows the visualisation of the amount of restoration.

Green = Lowest restoration, Red = Highest restoration
Anatomical Restoration

To achieve anatomical restoration after a vertebral compression fracture, the following should be considered:

1. **Implant positioning**
   - Controlled by a specific instrumentation
   - Implants’ positioning in both sagittal and transverse planes can be achieved to a best fit for the fracture’s shape and each patient anatomy.

2. **Implant expansion**
   - Controlled by millimetric implants expansion
   - Millimetric expansion of the implant can be maintained until the biomaterial is injected.

3. **Optimal Biomaterial positioning and interdigitation**
   - Controlled by Biomaterial fixed pathway and preservation of surrounding trabecular bone
   - Fixed pathway for the insertion of biomaterial through the implant helps minimize the risk of posterior leakage. Preserving the surrounding trabeculae by a cranio-caudal expansion allows for better interdigitation, thereby improving fixation and bone healing process.

   - Depending on the quality of the preserved trabecular structure, Vexim offers a range of injectable biomaterials:
     - *Cohesion® Bone Cement*
     - *Interface® Bone Fixation Composite*

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**Stabilise**

SpineJack®
Anatomical Restoration

To achieve anatomical restoration after a vertebral compression fracture, the following should be considered:

1. Controlled uni-directional cranio-caudal expansion to restore sagittal and coronal balance
2. Adaptation of implant's expansion to restore coronal angulation
3. Adaptation of implant's positioning for endplate restoration

Effective restoration measurement

Back in Shape

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   Controlled by a specific instrumentation

   Implants' positioning in both sagittal and transverse planes can be achieved to a best fit for the fracture's shape and each patient anatomy.

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   Millimetric expansion of the implant can be maintained until the biomaterial is injected.

Clinical cases

30-year-old patient
A.3.1. fracture in T12 after a fall from a ladder.
Surgery on fracture day + 5.

VAS graphs:
- Hospital stay: 2 days
- VAS Pre-op: 5.1
- VAS Post-op: 2.1

80-year-old patient
Low energy trauma in osteoporotic bone, A.1.2 fracture in L1.

- Hospital stay: 3 days
- VAS Pre-op: 8.1
- VAS Post-op: 0.7

78-year-old patient
After a fall accident patient suffered a A.3.1 fracture in T9.
Massive osteoporotic bone.
Surgery on fracture day + 4.

- Hospital stay: 4 days
- VAS Pre-op: 8
- VAS Post-op: 3

80-year-old patient
OSTEOPOROTIC

78-year-old patient
OSTEOPOROTIC
Controlled Anatomical Restoration

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