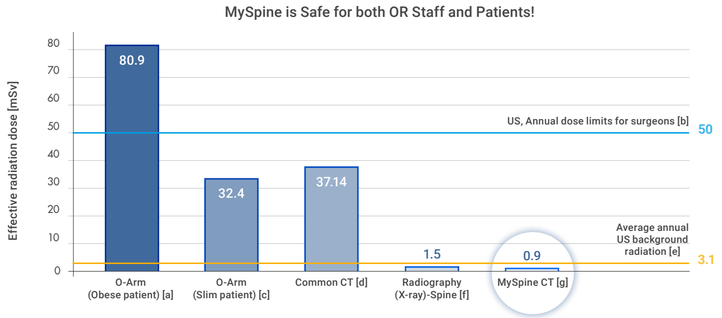
LOW RADIATION DOSE

- Patients are exposed to a **low dose** pre-op **CT scan**, resulting in a lower radiation exposure than a single full spine x-ray
- Pre-operative planning potentially **eliminates the need of intra-operative checks**, with a dramatic reduction of irradiation **-33%** compared to the free-hand technique [11,13]
- The **cumulative dose is potentially reduced** with respect to navigation-assisted technique

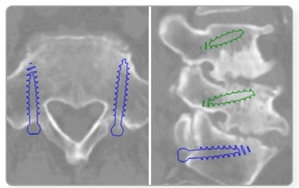


Comparison of irradiation between conventional and competitors' techniques and MySpine

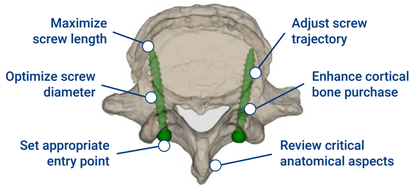
[a] Lange et al. Estimating the effective radiation dose imparted to patients by intraoperative cone-beam computed tomography in toracolumbar spinal surgery, Spine 2013 [b] US Nuclear Regulatory Commission's (USNRC) [c] Lange et al. Estimating the effective radiation dose imparted to patients by intraoperative cone-beam computed tomography in toracolumbar spinal surgery, Spine 2013 [d] Biswas et al. Radiation Exposure from Musculoskeletal Computerized Tomographic Scans, JBJS Am. 2009 [e] Health Physics Society Specialists in Radiation Safety, Lawrence Berkeley National Laboratory; Fact Sheet 2010 [f] Radiation Dose in X-Ray and CT Exams; 2013 Radiological Society of North America, Inc [g] MySpine, Charité University Hospital, Berlin, Germany

ACCURATE PRE-OP PLANNING

The MySpine Web Platform allows for a **simple** and **accurate 3D pre-operative planning**. The surgeon can simulate the final screw position in the patient's medical images and **preview any potential surgical critical aspects**.



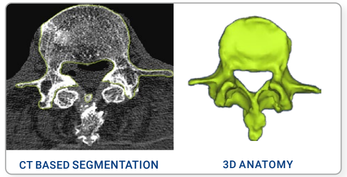
2D CT VIEW



3D VIEW

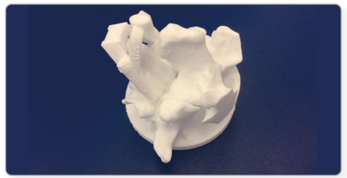
An **effective** tool for a **personalized surgical planning**.

MYSPINE CASE MANAGEMENT



1. IMAGE ACQUISITION
Low Dose CT scan to deliver 3D reconstruction of **each patient's** vertebral anatomy

2. 3D PRE-OP PLAN MANAGEMENT
The surgeon defines optimal implant parameters: screw **diameter**, **length** and **trajectory**



3. 3D PRINTING MYSPINE MC
3D patient-matched Jigs are sent to the hospital

4. MYSPINE MC MIS SURGERY
Surgery with dedicated MySpine MC system

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MINIMALLY INVASIVE PATIENT-MATCHED SOLUTIONS

MySpine MC is a **3D printed** patient-matched solution in the **midline cortical** approach. Posterior lumbar fusion is performed in a **minimally invasive,** muscle sparing way, allowing for shorter operating times and a substantial reduction of both radiation exposure and costs.

- **MINIMALLY INVASIVE**
- **EXCELLENT CLINICAL OUTCOMES**
- **HIGH EFFICIENCY**
- **LOW RADIATION DOSE**

The goal of MySpine MC is to combine an **excellent fusion rate** with **greater predictability** of the clinical outcomes.

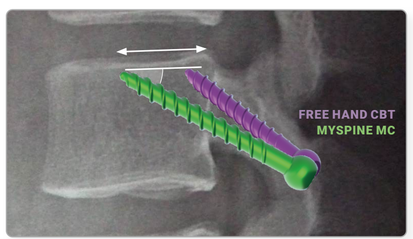
MySpine **MC** - **M**idline **C**ortical

EXCELLENT CLINICAL OUTCOMES

MySpine MC provides **highly precise implant positioning** which:

- allow **accurate positioning** of entry points in the the pars interarticularis with **favourable cortical bone purchase** [4]
- may enable the use of **longer screws** and **larger diameters** than CBT free hand [5]
- may lead to **uncompromised fusion rate** [6]

Moreover, the pre-operative trajectory management may **reduce the risk of nerve root injury** [7]



99.5%
SAFE PEDICLE SCREW POSITIONING [14]

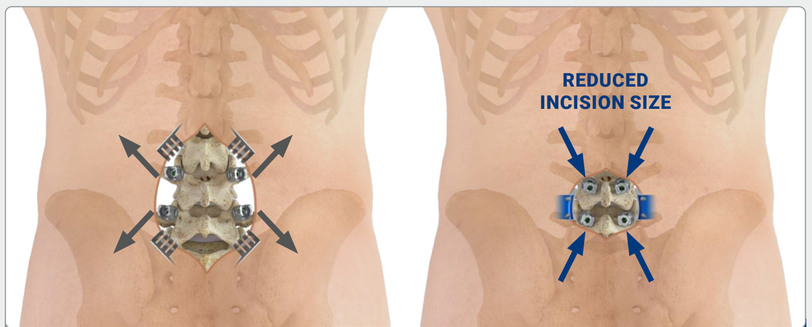
-69%
REDUCED SCREW LOOSENING RATE [9]

+35%
SIGNIFICANT INCREASE IN PULL-OUT RESISTANCE [14]

-83%
ANTEROPOSTERIOR SPONDYLOLISTHESIS CORRECTION SLIP [10]

WHY A MYSPINE MC MINIMALLY INVASIVE SURGERY?

Thanks to its muscle sparing technique, the erector spinae muscles are gently manipulated and a **small skin incision** of 4-5cm is performed.
For this reason, MySpine MC delivers a **minimally disruptive surgery**, which is fundamental to drive a **fast patient recovery**. MySpine MC will **improve the patients' quality of life** and **hasten their recovery** after a spinal fusion surgery.



From **Minimally Invasive** Surgery
to **Personalized Medicine**
and beyond

DECREASED POST-OPERATIVE PAIN

In comparison with "conventional" open surgical techniques, the MySpine MC approach may **reduce the postoperative pain** thanks to a **less invasive technique**. [16,17] **ODI** index at 12 months is **reduced by 18% more** than conventional technique, leading to a **better patient clinical score**.

-18%
POST-OP PAIN [16,17]

SHORTER REHABILITATION

While **not violating the neuro-muscular structures**, the MySpine MC technique may **decrease the muscular atrophy** leading to a **shorter rehabilitation**. [16,17]

*"My patients can **walk autonomously** the day after the surgery."* MD N. Marengo, Italy

SHORTER HOSPITAL STAY

The MySpine MC technique usually **significantly reduces the duration of the hospital stay by 37%**. [13]

*"MySpine MC is a **Minimally Invasive** technique proven to be successful in **Outpatient Setting**."* MD I. LaMotta, USA

-37%
HOSPITAL STAY [13]

SMALL SKIN INCISION

With MySpine MC, the skin incision is often shorter than with "conventional" open surgery and therefore **scar tissue is reduced**, guaranteeing an **easier soft tissue handling** and a **more "cosmetic" procedure**. [16,17]

FASTER RETURN TO DAILY ACTIVITIES

The MySpine MC 3D Printed Patient-Specific Solution may provide **better biomechanical performance**, allowing for an **improved long-term outcome**. [15,16,17]

*"At 6-month follow-up, our patients show **important clinical improvements**, without new neurologic deficits or radiologic pathologic findings."* MD K. Matsukawa, Japan

LESS BLOOD LOSS

Preservation of muscles and vessels may **reduce blood loss**, -16% compared to conventional open access surgery, for **more conservative treatments**. [16,17]

-16%
BLOOD LOSS [16,17]

REDUCED COMPLICATIONS

The MySpine MC technique **significantly reduces the incidence of complications,** when compared to free-hand techniques, because of the **highly accurate implant positioning**. [13,14]

*"In our specific setting, the same surgical team **reduced complications** from 16% using the free-hand technique to **0% with MySpine MC**."* MD S. Petrone, MD N. Marengo et al., Italy

HIGH EFFICIENCY

ECONOMIC EFFICIENCY

- **No expensive** capital investment is required
- **No recurrent service cost**
- **Rapid Learning Curve** for effective accuracy
- **Outpatient Surgery:** hospital can potentially capitalize on resources and increase volumes as patients return home the same day of the surgery [12]

TIME EFFICIENCY

- **No peri-operative image acquisition,** thanks to the accurate pre-op planning [11]
- Compared to free-hand CBT, the MIS MySpine MC technique leads to a significant **34% reduction** of **procedural time** [13]

-34%
PROCEDURAL TIME [13]