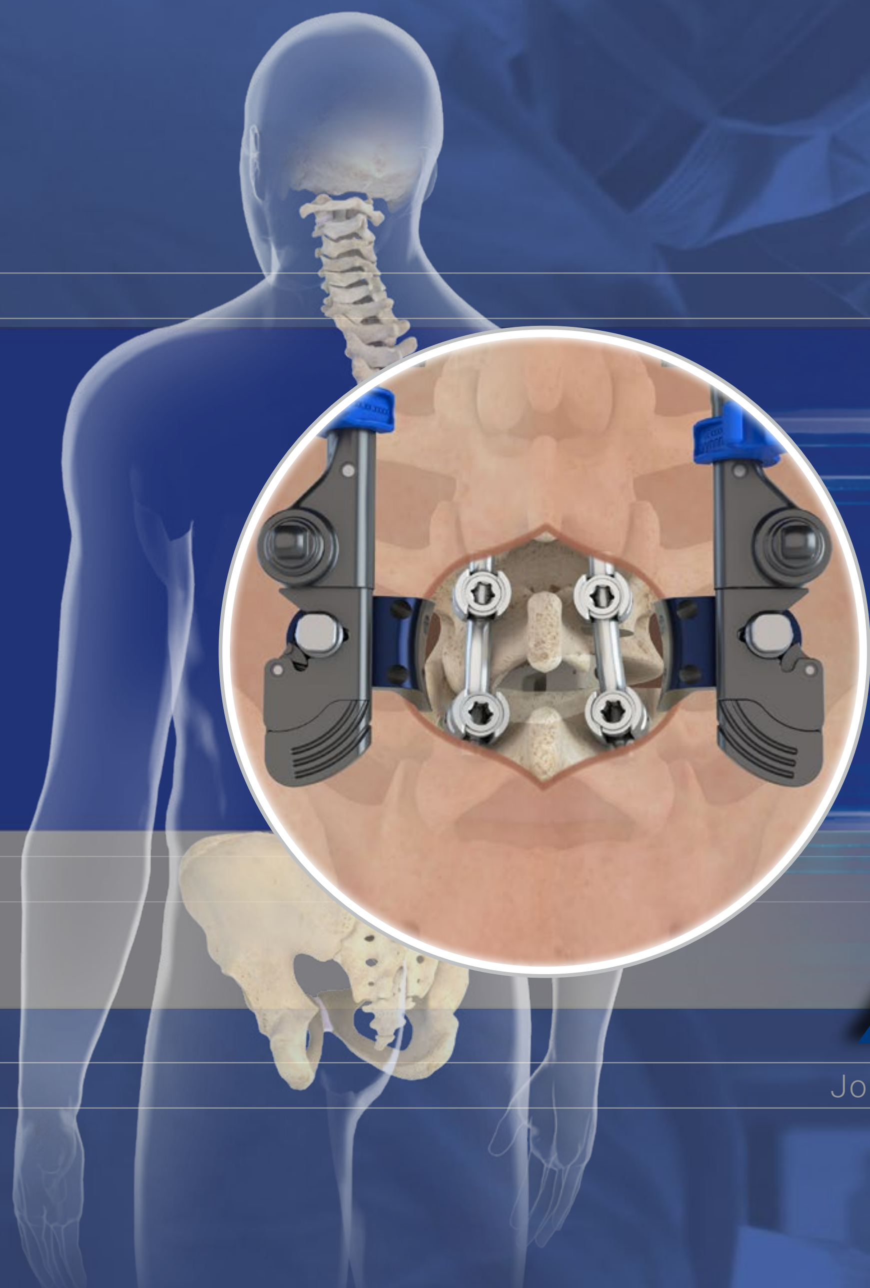
MySpine® MIS MC

PERSONALIZED MIDLINE CORTICAL PROCEDURE

COMPLETE SOLUTION IN THE MIDLINE CORTICAL APPROACH



Procedural Brochure

Joint | **Spine** | Sports Med

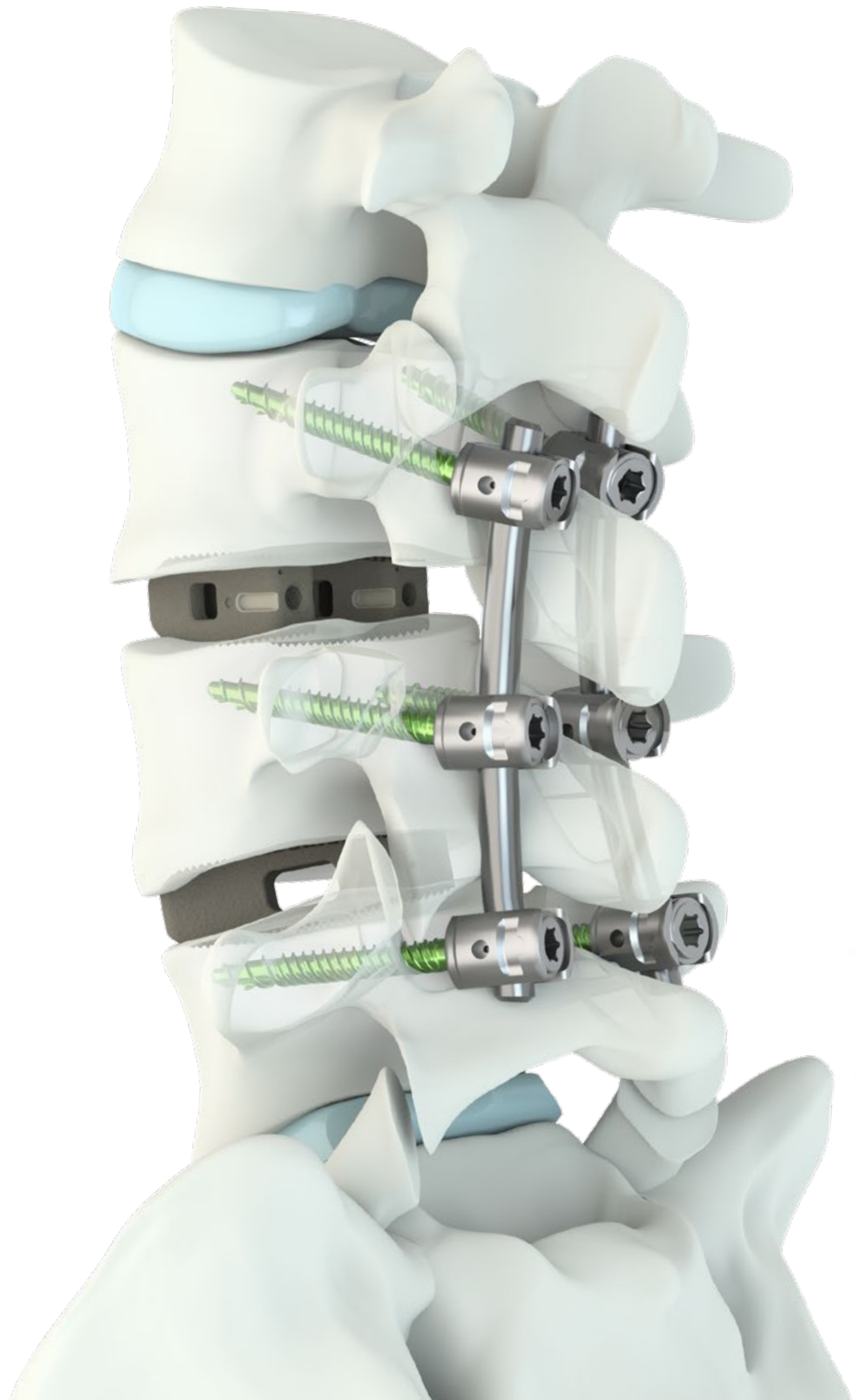
Medacta International

MySpine® MIS MC

COMPLETE SOLUTION IN THE MIDLINE CORTICAL APPROACH

The **MySpine® MIS MC procedure** is a complete solution that combines **MySpine 3D printed guides**, **M.U.S.T.® MC screw** system, and our **MectaLIF® posterior cage** system. MySpine 3D printed guides provide highly precise implant positioning in the **midline cortical approach**.[1] The M.U.S.T. MC screw system features cortical/cancellous screw threads and a **slim profile tulip** that optimizes a **minimally invasive approach**.

The MectaLIF cage system works in harmony with the guides and screws to provide supplemental fixation.



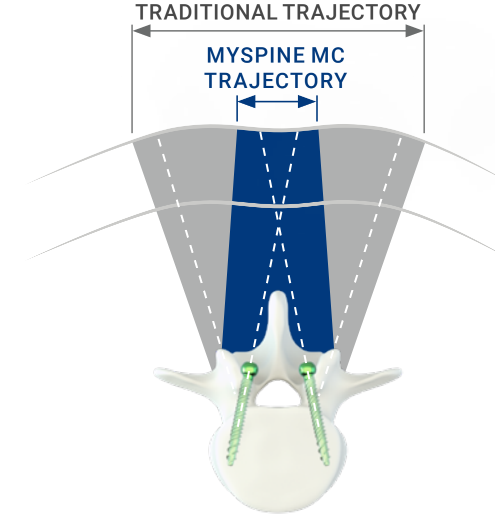
M.U.S.T. MC

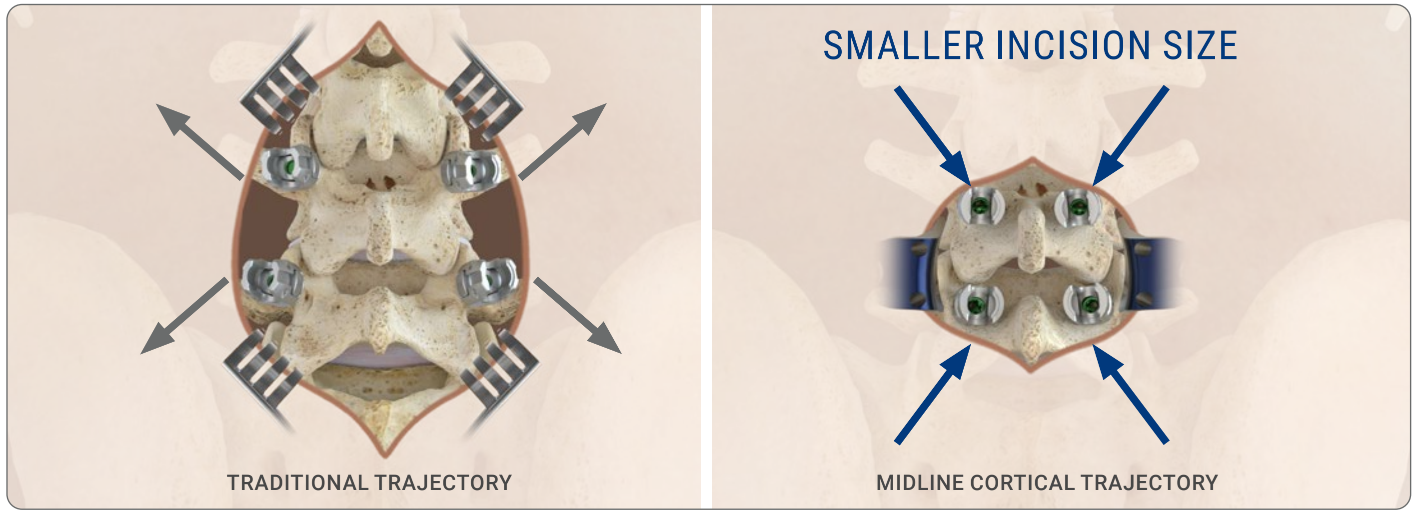
MectaLIF System

MySpine MC

WHY DIVERGENT SCREW POSITIONING?

Divergent screws **significantly increase the pullout resistance up to 30%** with respect to the conventional technique.[2]

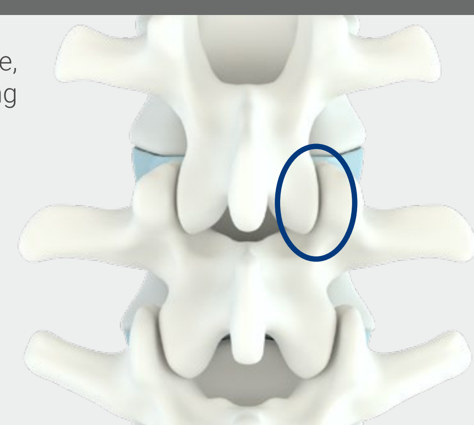




PATIENT BENEFITS OF THE MIDLINE CORTICAL APPROACH

Compared to the traditional open technique, this approach provides the following potential benefits for the patient:

- Supradjacent facet preservation[4,5]
- Faster discharge[6]
- Less pain[5]
- Quicker recovery[5,6]
- Enhanced muscle preservation[3]
- Reduced blood loss[7]



POTENTIAL FOR A **LOWER ADJACENT SEGMENT DISEASE (ASD)** VS. CONVENTIONAL TECHNIQUE[3]

UP TO 71% DECREASE

PERSONALIZED 3D PLANNING

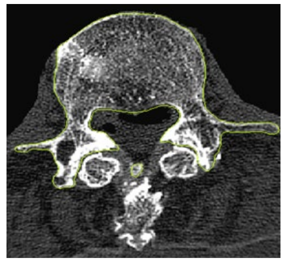
An **accurate 3D preoperative** plan based on a **low dose CT scan** delivers **patient-matched guides**, resulting in **zero capital investment**.

MYSPINE WEBPLANNER

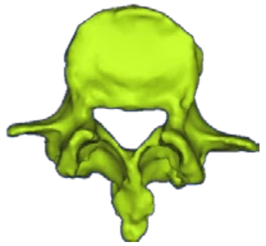
The MySpine Webplanner allows for **simple and accurate 3D preoperative planning**. Thanks to this tool, the surgeon can optimize screw parameters, entry points, and trajectories based on the patient anatomy. This can help **to avoid potential intraoperative complications for the patient**, such as pedicle fractures and neurovascular injuries.[6,8] Additionally, the surgeon can simulate the final screw position from the patient's medical images and preview any potential surgical obstacles.

LOW DOSE CT SCAN

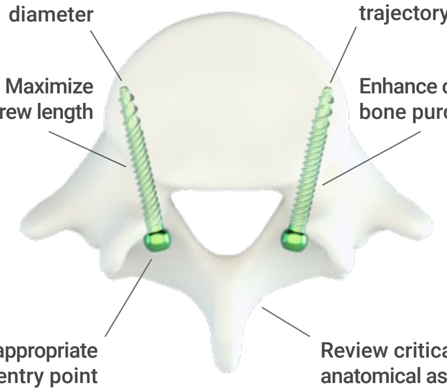
A specific **low dose CT protocol** ensures a safe image acquisition, reducing the amount of irradiation absorbed by the patient. Preoperative planning **potentially reduces the need for intraoperative checks**, with a reduction of irradiation.[1] **The cumulative dose can be potentially reduced** compared to the navigation-assisted technique.



CT BASED SEGMENTATION

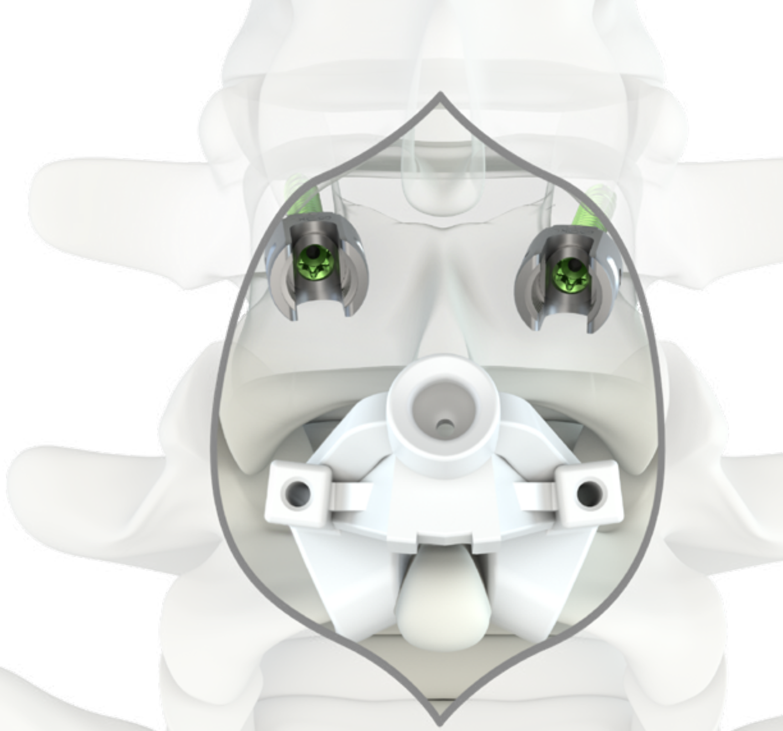


3D ANATOMY



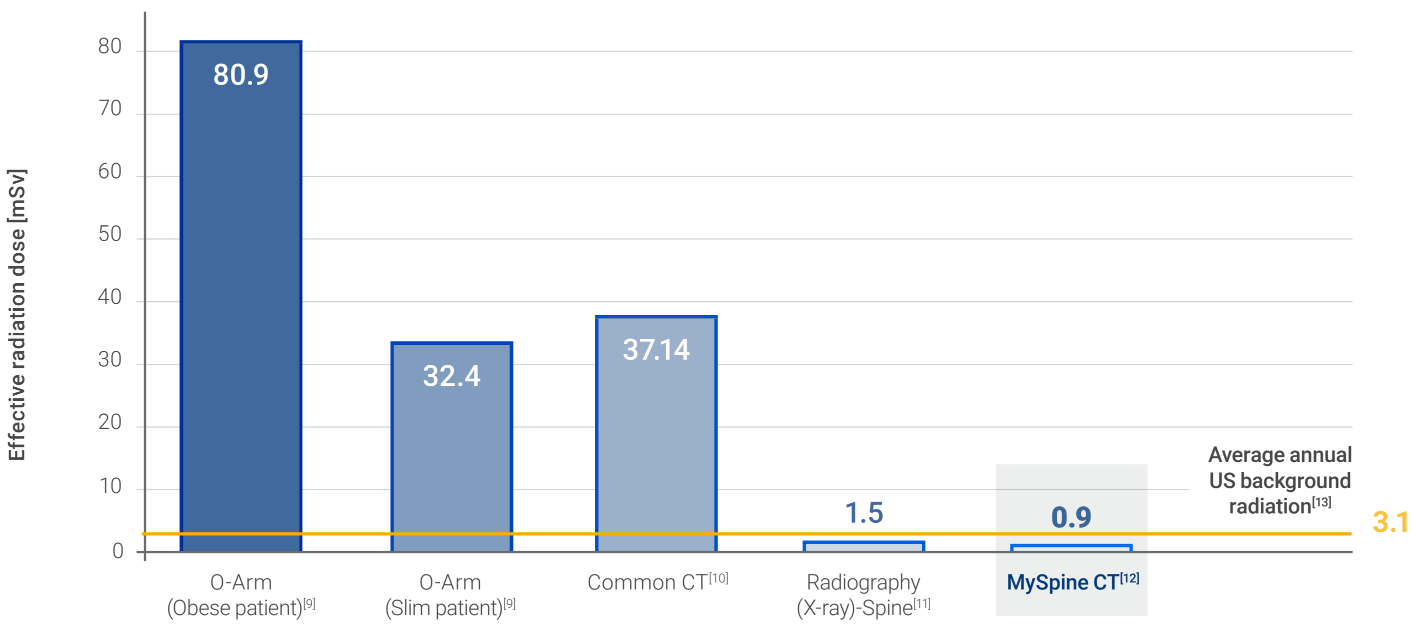
From Minimally Invasive Surgery to Personalized Medicine and Beyond

MYSPINE MC GUIDE



MIS INCISION WITH MYSPINE MC GUIDE

COMPARISON OF CONVENTIONAL AND COMPETITORS TECHNIQUE IRRADIATION VS. MYSPINE



MySpine potentially reduces the radiation exposure for both OR staff and patients!

PATIENT-MATCHED TECHNOLOGY

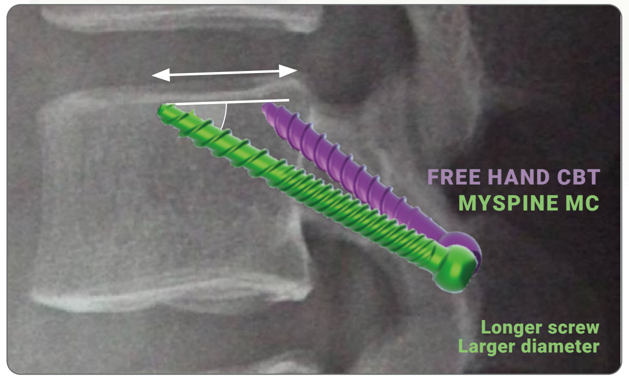
MySpine MC is a 3D printed patient-matched solution in the midline cortical approach. Following the preoperative trajectory, a **3D patient-matched guide** is designed to match the patient's anatomy. This **navigation platform** provides accurate intraoperative guidance for safe screw positioning with no expensive capital investment or restrictive purchasing agreements.

MYSPINE MC VS. FREE HAND CBT

The **MySpine MC guide** offers the possibility to position the **entry points at the pars interarticularis** with favorable cortical bone, allowing for **longer screws** and **larger diameters** compared to conventional CBT free hand.[14]

TIME SAVING TECHNIQUE

Positioning the 3D printed guides on the planned vertebra creates a screw path that is safe and time effective. This potentially eliminates the need for perioperative image acquisition and offers a significant **reduction of procedural time**.[15]



MC RETRACTOR

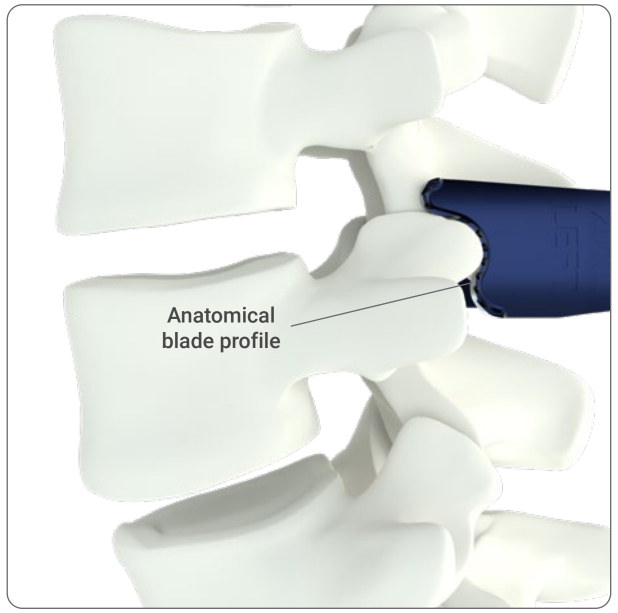
A dedicated **MIS retractor** with **anatomical blades** for **minimally disruptive access**.

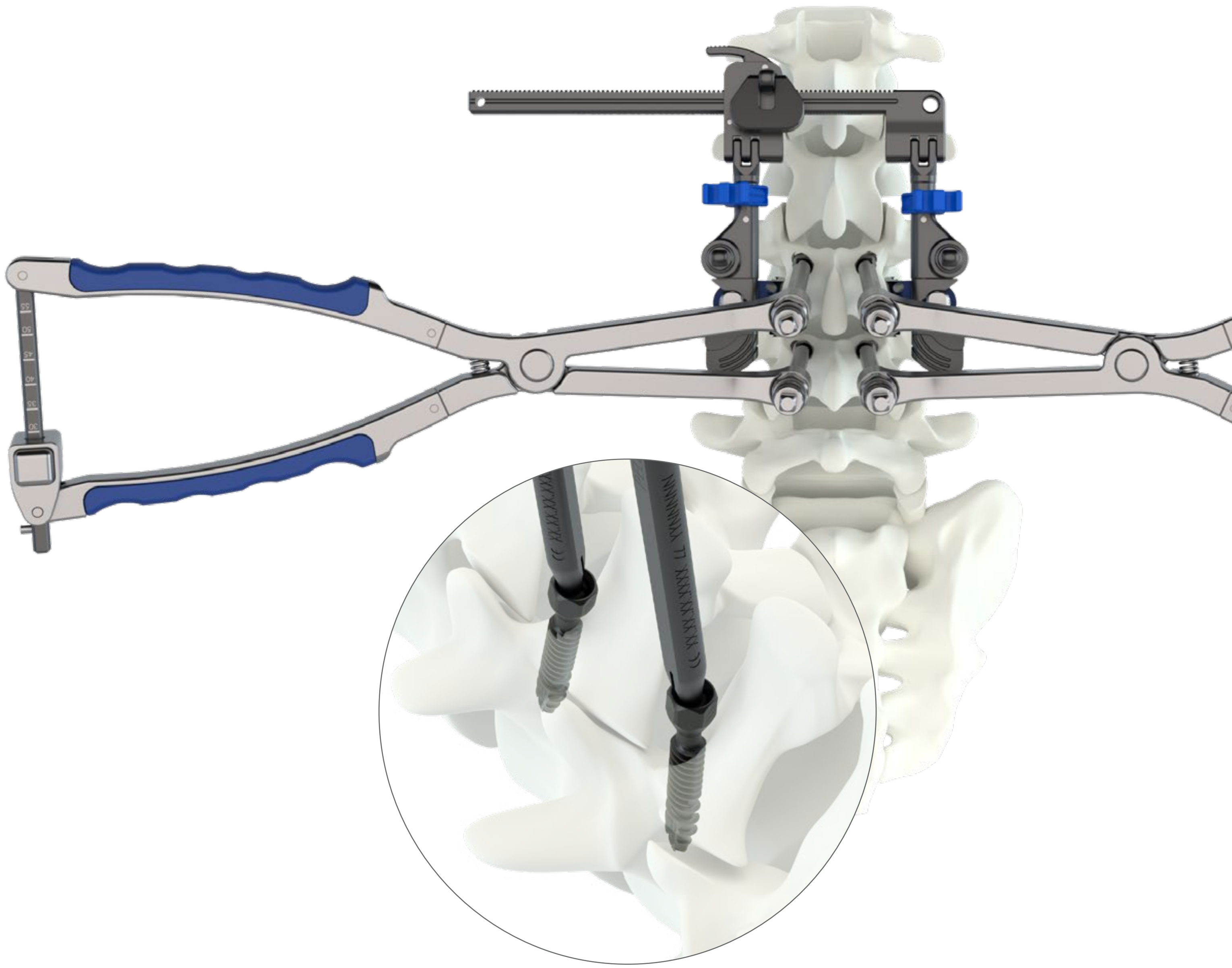
QUICK LATERAL MOUNTING
The retractor frame has been designed with a lateral mounting feature for **quick blade mounting**, which also allows for connection of the blades **in situ**.

EFFECTIVE MUSCLE RETRACTION
Further muscle retraction can be achieved by tilting the blades (**up to 30 degrees**) for an **optimal in situ visualization**.

ANATOMICAL BLADE DESIGN
The favorable fit of the blade onto the posterior anatomy provides **optimal tissue retraction** and helps prevent tissue creep, thus improving the field of view.

LIGHT SYSTEM
The compatible light system allows the surgeon to use **optical illumination** for **improved in situ visualization**.



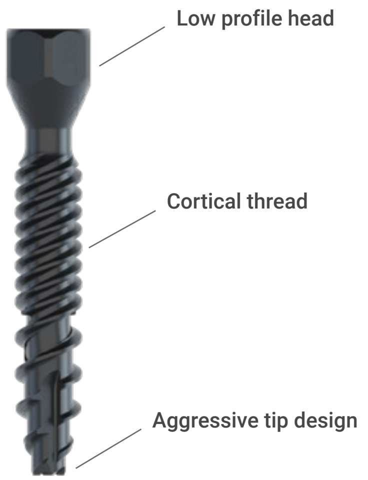


MC MODULAR TAP AND DISTRACTOR

The **distractor system** with **modular & low profile taps** allows for a **straightforward technique** with an **effective distraction maneuver**.

MODULAR AND LOW PROFILE
The modular and low profile design allows for a quick distractor system connection.

VERSATILE AND ROBUST
The distractor system can be adapted to the surgeon's **distraction technique** for an **easy intervertebral body device insertion** or to perform a **simple and effective decompression** maneuver.



MECTALIF SYSTEM - POSTERIOR LUMBAR CAGES

Medacta posterior lumbar cages are **versatile interbody fusion devices** designed for unilateral transforaminal approach or bilateral posterior approach.

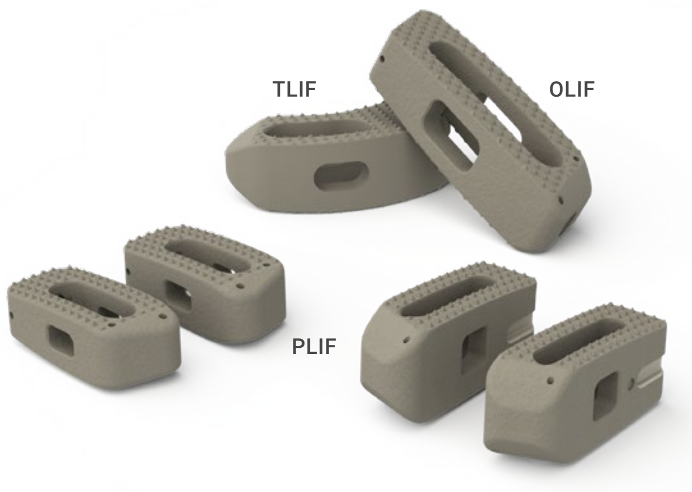
COMPREHENSIVE CAGE PORTFOLIO

Thanks to their **anatomical design**, the Medacta posterior cages provide **anterior-posterior support** with endplates in different shapes. This allows for an **improved bicortical bridge support** designed to enhance physiological stress distribution compared to standard designs[16].

POTENTIAL BENEFITS

- Provide in situ stability
- Restore the native disc space height and lordosis[17]
- Contribute to the recovery of the spinal balance

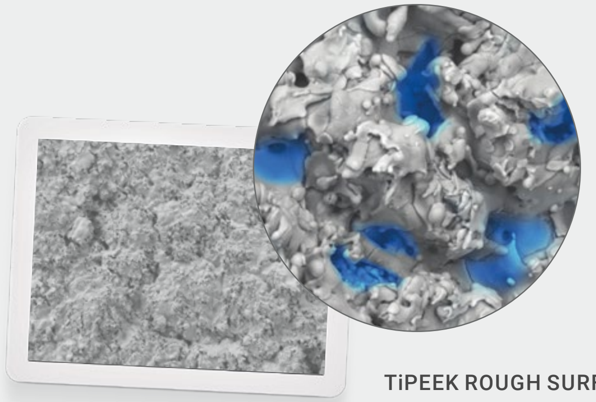
MectaLIF SYSTEM



UNIQUE TITANIUM COATING

The Medacta posterior cages are plasma spray coated with a **unique roughness** and a **3D complex topography**.

- The micro-scale toughness may lead to **improved primary stability**, and surface friction may enhance secondary stability.[18]
- **90% fusion rate** demonstrated after 3 months.[19]
- Maintenance of **interbody height restoration** compared to PEEK implants.[19]

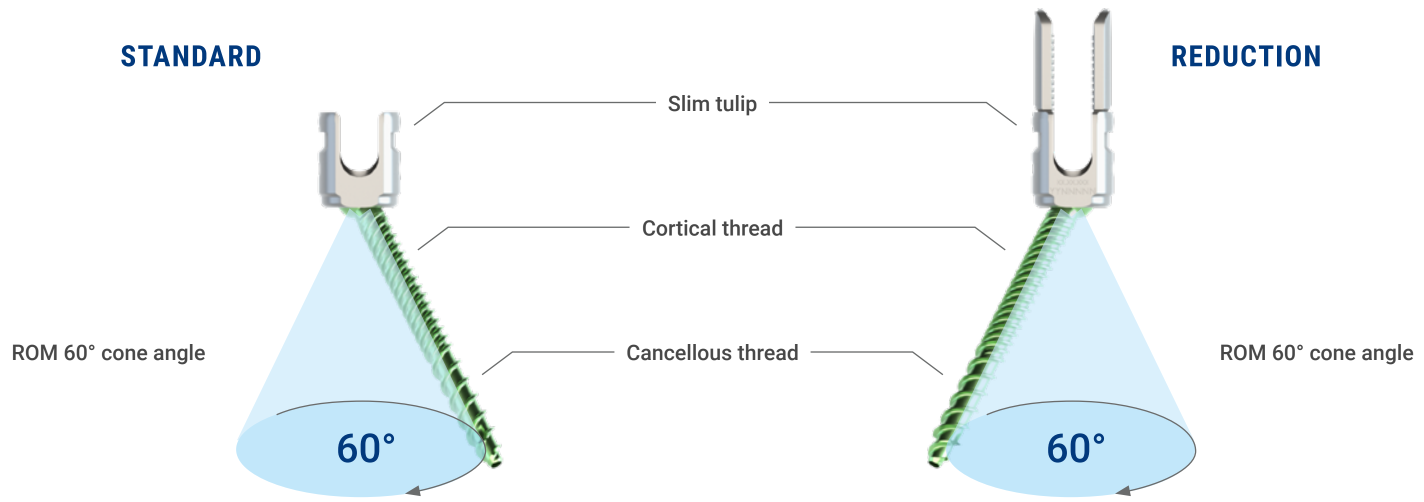


TiPEEK ROUGH SURFACE

The Titanium Coated PEEK cages (TiPEEK) incorporate the advantages of both PEEK polymer and Titanium. The cages are a **high-quality biocompatible implant** that may provide appropriate spine support, **preventing the risk of subsidence**[20] and allow for proper load force transmission at the implant-tissue interface.[21]

M.U.S.T. MC SCREW SYSTEM

The thread pitch on the screw is differentiated for **cortical/cancellous bone purchase**, enhancing the posterior fixation.

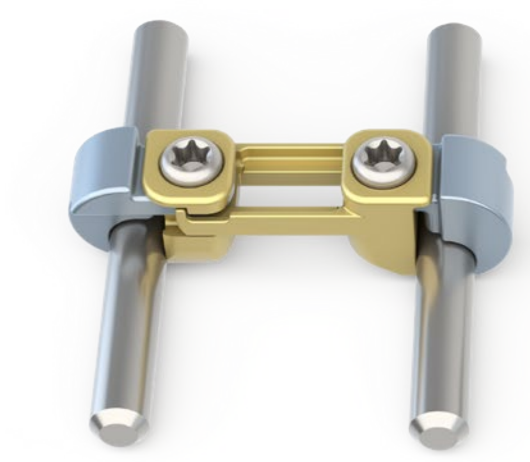


The M.U.S.T. MC screw has a low profile tulip, reducing the risk of interference with the surrounding bone and tissue.

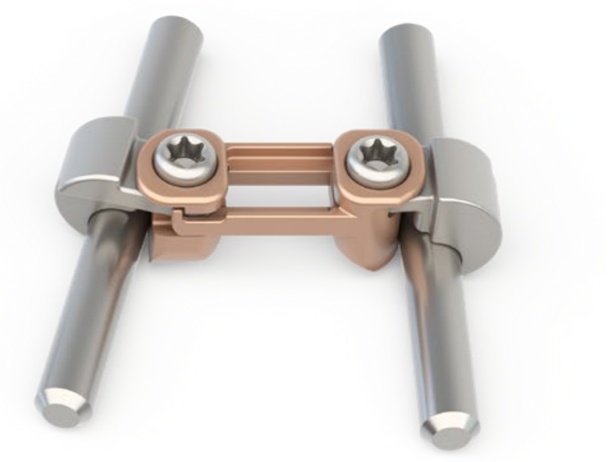
M.U.S.T. MC CROSS-CONNECTOR

The Medacta portfolio includes dedicated cross-connectors, designed with a minimized profile and is intended for use with rod distance between 19 and 40mm in length. Two versions of the M.U.S.T. MC cross connector are available: straight and adjustable. In the straight version, the hook can tilt +/- 5°, and in the adjustable version +/- 15°.

STRAIGHT



ADJUSTABLE



MYSPINE MIS MC POTENTIAL POSTOPERATIVE BENEFITS

SHORTER HOSPITAL STAY

The MySpine MC technique may significantly **reduce the hospital stay duration by 37%**.[22]

*"MySpine MC is a **Minimally Invasive technique** proven to be successful in Outpatient Setting."*

***I. LaMotta, MD**, USA*

REDUCED COMPLICATIONS

The MySpine MC technique **reduces the incidence of complications** when compared to free-hand techniques because of the **highly accurate implant positioning**.[22]

*"In our specific setting, the same surgical team **reduced complications from 16%** using the free-hand technique **to 0% with MySpine MC**."*

***N. Marengo, MD**, Italy*

SHORTER RECOVERY TIME

While **not violating the neuro-muscular structures**, the MySpine MC technique may **decrease the muscular atrophy** leading to a **shorter rehabilitation**.[4,5]

*"My patients can **walk autonomously** the day after the surgery."*

***N. Marengo, MD**, Italy*

LONG-TERM OUTCOME

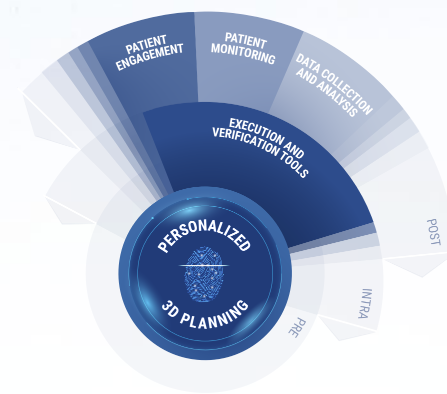
The MySpine MC 3D printed-specific solution may provide **better biomechanical performance**, allowing for an **improved long-term outcome**.[4,5,23]

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

***K. Matsukawa, MD**, Japan*

MYSOLUTIONS PERSONALIZED ECOSYSTEM

A network of advanced digital solutions designed to improve patient outcomes and healthcare efficiency



Medacta's MySolutions Personalized Ecosystem is designed around the patient's needs and expectations, in collaboration with an international network of expert surgeons, with the aim of delivering value throughout the entire patient journey.

Surgeons' advanced 3D planning is at the core of our platform, followed by highly accurate execution tools such as patient-matched surgical guides, as well as an augmented-reality-based surgical platform and verification software. Medacta has created a patient- optimized pathway tool to improve patients' surgical experience and support them during the continuum of care. This tool is a web- based archiving and analyzing system that also allows surgeons to record and measure their clinical outcomes.

Why Medacta personalized enabling technologies?

PERSONALIZED 3D PLANNING

Leverage Medacta's surgeon experience with our personalized **3D planning tool**. The preoperative planning software offers solutions to accurately plan even the most challenging case.

PRECISE EXECUTION

Provide **complete and precise pre- and intraoperative guidance** for screw placement, allowing surgeons a personalized approach based on each **patient's unique anatomy**.

STREAMLINED WORKFLOW

Surgeon's procedural workflow can be seamlessly integrated with Medacta's personalized enabling technology, potentially **saving O.R. space, setup time, and increasing operating efficiency**.

FULLY SUPPORTED ADOPTION

The **learning curve** can be limited to a few cases with the support of tailored **high-level educational pathways**. With the **M.O.R.E. Institute**, the surgeon is never alone when discovering new technologies.

SUSTAINABLE SOLUTION

- **Limited capital investment** required.
- **No service cost**

NEXTAR AUGMENTED REALITY SURGICAL PLATFORM

MySpine PATIENT MATCHED TECHNOLOGY IN SPINE SURGERY

REDEFINING BETTER
IN ORTHOPAEDICS
AND SPINE SURGERY

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MySpine® MIS MC
Procedural Brochure

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References: ***[1]*** *Matsukawa K. et al., Comparison of safety and perioperative outcomes between patient-specific template-guided and fluoroscopic-assisted freehand lumbar screw placement using cortical bone trajectory technique, Global Spine Journal, 2022.* ***[2]*** *Santoni B.G. et al., Cortical bone trajectory for lumbar pedicle screws, The Spine Journal, 2009.* ***[3]*** *Sakaura H. et al., Posterior lumbar interbody fusion with cortical bone trajectory screw fixation versus posterior lumbar interbody fusion using traditional pedicle screw fixation for degenerative lumbar spondylolisthesis: a comparative study, JNS, 2016.* ***[4]*** *Matsukawa K. et al., Incidence and Risk Factors of Adjacent Cranial Facet Joint Violation Following Pedicle Screw Insertion Using Cortical Bone Trajectory Technique, Spine, 2016.* ***[5]*** *Marengo N. et al., Cortical Bone Trajectory Screws in Posterior Lumbar Interbody Fusion: Minimally Invasive Surgery for Maximal Muscle Sparing—A Prospective Comparative Study with the Traditional Open Technique, Clinical Study, February 2018.* ***[6]*** *Marengo N. et al., Cortical Bone Trajectory Screw Placement Accuracy with a Patient-Matched 3-Dimensional Printed Guide in Lumbar Spinal Surgery: A Clinical Study, World Neurosurgery, June 2019.* ***[7]*** *Khanna N. et al. Spine (Phila Pa 1976). 2016 Apr;41 Suppl 8:S90-6. doi: 10.1097/BRS.0000000000001475. Medialized, Muscle-Splitting Approach for Posterior Lumbar Interbody Fusion: Technique and Multicenter Perioperative Results.* ***[8]*** *Matsukawa K. et al., Accuracy of cortical bone trajectory screw placement using patient-specific template guide system, Neurosurgical Review, 2019.* ***[9]*** *Lange et.al. Estimating the effective radiation dose imparted to patients by intraoperative cone-beam computed tomography in thoracolumbar spinal surgery, Spine 2013.* ***[10]*** *Biswas et.al. Radiation Exposure from Musculoskeletal Computerized Tomographic Scans, JBJS Am. 2009.* ***[11]*** *Radiation Dose in X-Ray and CT Exams; 2013 Radiological Society of North America, Inc.* ***[12]*** *MySpine, Charité University Hospital, Berlin, Germany.* ***[13]*** *Health Physics Society Specialists in Radiation Safety, Lawrence Berkeley National Laboratory; Fact Sheet 2010.* ***[14]*** *Matsukawa -2nd MORE Japan MySpine cortical Bone Trajectory 2017. https://mysurgeon.medacta.com/uploads/presentation/attachments/d33a45ed-c550-438b-96b8-5e3fb1696725.mp4.* ***[15]*** *Farshad et. al. Accuracy of patient-specific template-guided vs. free-hand fluoroscopically controlled pedicle screw placement in the thoracic and lumbar spine: a randomized cadaveric study. Eur Spine J. 2016.* ***[16]*** *Influences of disc degeneration and bone mineral density on the structural properties of lumbar end plates; Yang Hou et.al: The Spine Journal 2012. Osteoporotic patients in spine surgery (Michael Rauschmann).* ***[17]*** *Biswas et.al. Radiation Exposure from Musculoskeletal Computerized Tomographic Scans, JBJS Am. 2009.* ***[18]*** *Walsh W.R. et al, Titanium coated interbody devices. 8th M.O.R.E. International Symposium Proceedings- Spine Chapter, 2016.* ***[19]*** *Rickert M. et al., Transforaminal lumbar interbody fusion using polyetheretherketone oblique cages with and without a titanium coating: a randomised clinical pilot study. The Bone & Joint Journal (Oct 2017) 1366-1372.* ***[20]*** *Chen et al. Comparison of titanium and polyetheretherketone (PEEK) cages in the surgical treatment of multilevel cervical spondylotic myelopathy: a prospective, randomized, control study with over 7-year follow-up. Eur Spine J. 2013 Jul;22(7):1539-46.* ***[21]*** *Sagomonyants KB, Biomaterials 29 (2008) 1563-1572.* ***[22]*** *Petrone S. et al., Cortical bone trajectory technique's outcomes and procedures for posterior lumbar fusion: A retrospective study, Journal of Clinical Neuroscience, 2020.* ***[23]*** *Matsukawa K. et al., Cortical pedicle screw trajectory technique using 3D printed patient-specific-guide, M.O.R.E. Journal, 2018.*