



ZIMMER BIOMET

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Cervical Solutions

MaxAn[®]

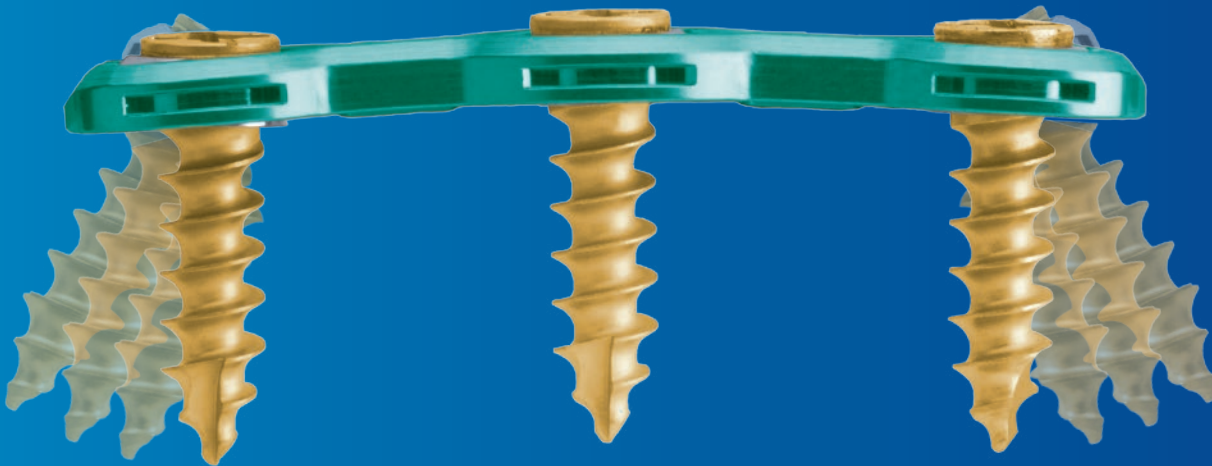
Anterior Cervical Fixation System

The MaxAn System is an anterior cervical plate with a design rationale that helps to minimize the risk of adjacent-level ossification.



Maximization OF SCREW ANGULATION

The MaxAn System accommodates the widest cephalad/caudal screw angulation sweep of any cervical plate to allow for maximum plate distance from adjacent levels. Clinical studies demonstrated that the risk of moderate to severe adjacent-level ossification (ALO) significantly decreases when the plate-to-disc distance (PDD) is greater than 5mm from the adjacent level.^{1,2}



DESIGNED FOR SUCCESS



Precision

- The MaxAn 8mm plate is the smallest anterior cervical plate on the market, allowing for ample distance (5mm) from the adjacent level.
- Multiple plate sizes accommodate a range of patient anatomies and provide surgeons with choices for the best fit, with plates increasing in 1mm increments.



Efficiency

- The innovative Trial Drill Guide allows for trialing, drilling and sizing to take place simultaneously, promoting reproducible results.
- The single-step locking mechanism reduces steps in the procedure and may cut back on time spent in the OR and the amount of retraction used on patients.

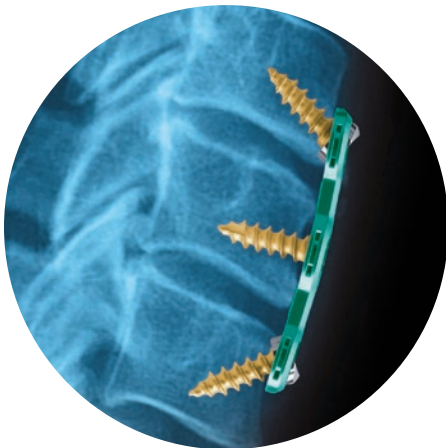


Safety

- Up to 30° of cephalad/caudal screw angulation encourages screw purchase in denser bone.
- The combination of plate sizes and screw angulation allows for maximal plate placement away from adjacent levels, potentially reducing the risk of moderate to severe ALO.

MINIMIZE THE RISK OF ALO: CLINICAL STUDIES

Spine surgeons have achieved great success in treating patients with anterior cervical discectomy and fusion (ACDF). However, the incidence of ALO following ACDF has diminished the positive results seen with this procedure. While ALO may not be fully preventable, two clinical studies published in 2005 and 2007 indicated that the incidence of moderate to severe ALO significantly decreased when the plate-to-adjacent-level disc distance was greater than 5mm from the adjacent level.^{1,2} **The design rationale of the MaxAn System is rooted in these studies.**



Clinical Study 1: Development of adjacent-level ossification in patients with an anterior cervical plate*

Authors: Jong-Beom Park, MD, PhD, Yong-Sun Cho, MD, and K. Daniel Riew, MD

Publication: *The Journal of Bone and Joint Surgery (American Edition)*

Study Design

Retrospectively reviewed radiographs, 62 patients, 24-month minimum follow-up, 36-month average follow-up.

Study Findings

The occurrence of ossification was significantly increased for levels with a PDD less than 5mm (67% at cephalad and 45% at caudal) compared with levels with a PDD greater than 5mm (24% at cephalad and 5% at caudal).

Clinical Study 2: Timing of development of adjacent-level ossification after anterior cervical arthrodesis with plates*

Authors: Jong-Beom Park, MD, PhD, Thanet Wattanaaphisit, MD, and K. Daniel Riew, MD

Publication: *The Spine Journal*

Study Design

Retrospectively reviewed radiographs, 62 patients, 24-month minimum follow-up, 36-month average follow-up.

Study Findings

The occurrence of ossification was significantly increased for levels with a PDD less than 5mm (72.1%, 49/68) compared with levels with a PDD greater than 5mm (45.5%, 20/44).

*These clinical studies did not include the use of the MaxAn System, and findings are not necessarily indicative of results involved with the MaxAn System.

OPTIMIZE PROCEDURES WITH MULTIPLE PLATE SIZES

Design Challenge: In an effort to avoid ALO, it is important to keep the plate greater than 5mm from the adjacent level.^{1,2} To do this, use plates that are small enough to cover the shortened hole-to-hole distance properly.



The Zimmer Biomet Solution

The MaxAn System offers single-level plates that begin at 8mm hole-to-hole (to be used with a 5mm graft) and increase in 1mm increments.



Designed to Help Minimize the Risk of ALO

The MaxAn System's 8mm plate is currently the smallest anterior cervical plate on the market. It is available in single-millimeter increments, which makes it easier to provide ample distance (5mm) from the adjacent level.



ACHIEVE PROPER SCREW PLACEMENT

Design Challenge: To remain greater than 5mm from the adjacent disc space, the placement of the screws is essential to the success of the procedure. The screw holes must be placed close to the endplate of the treating disc—which can be hard cortical bone—and this can be difficult to achieve consistently with all patients.



The Zimmer Biomet Solution

The Trial Drill Guide is an innovative instrument that allows for trialing the disc space and drilling screw holes while simultaneously sizing the plate. The Trial Drill Guide places the screw holes exactly 1.5mm above and below the endplates in a single-level fusion. It also does the same for the cephalad holes in a multi-level construct, which provides a reproducible method for placing screws greater than 5mm from the adjacent level.



Designed to Help Minimize the Risk of ALO

Zimmer Biomet is currently the only manufacturer that offers a Trial Drill Guide as part of its Anterior Cervical Plate Systems.

MAXIMIZE SCREW ANGULATION

Design Challenge: It is commonly believed that screw threads placed too close to the endplates can compromise purchase and potentially lead to subsidence.



The Zimmer Biomet Solution

The MaxAn System's screws can be placed at any angle up to 30° cephalad on the superior end of the plate and up to 30° caudal on the inferior end of the plate. This feature helps to angle the screws away from the endplates while still engaging in cortical bone. In addition, each screw is drilled 5° medially for a total screw convergence of 10° on the midline.



Designed to Help Minimize the Risk of ALO

The MaxAn System's 30° of cephalad/caudal screw angulation at the ends of the plate is currently the highest amount of screw angulation of any anterior cervical plate on the market. This feature encourages screw purchase in denser bone.

References:

1. Park JB, Cho YS, Riew KD. Development of adjacent-level ossification in patients with an anterior cervical plate. *J Bone Joint Surg Am.* 2005;87:558–63.
2. Park JB, Wattanaaphisit T, Riew KD. Timing of development of adjacent-level ossification after anterior cervical arthrodesis with plates. *Spine J.* 2007; 7(6):633–36.



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