



Disc Space Angles

Importance of selecting the right M6-L to provide optimal biomechanics, maximum range of motion and minimal shear forces

The M6-L disc is designed to replicate the physiologic motion of the healthy lumbar spine. Providing this motion is dependent on:

- Patient Selection
- Disc Space Height and Mobilization
- Device Angle Selection

Patient Selection

Evaluation of the index level disc angle in the standing neutral position is a critical component when selecting a patient for implantation of the M6-L device. Implanting the M6-L into a disc space with a disc angle of $> 13^\circ$ may result in limited range of motion and high shear forces affecting the stability of the device (Figures 1 and 2).

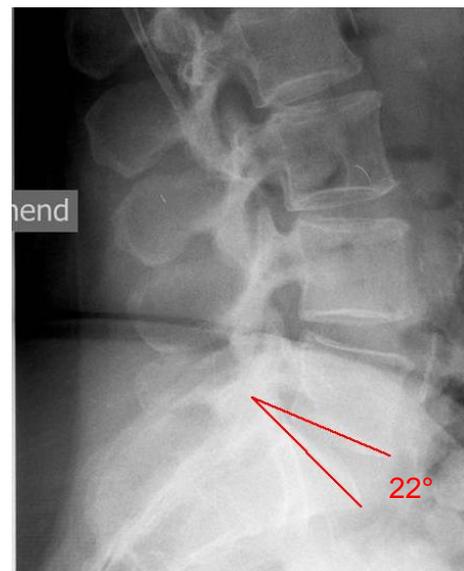


Fig. 1 - Pre-operative disc angle $> 13^\circ$ in the neutral position



Figure 2: Placement of a 10° M6-L in a 22° space resulting in limited range of motion and excessive shear forces.



Use of a radiographic template (Fig. 3) during the pre-operative screening process may aid the surgeon in excluding patients with excessive disc angles for implantation of the M6-L device.

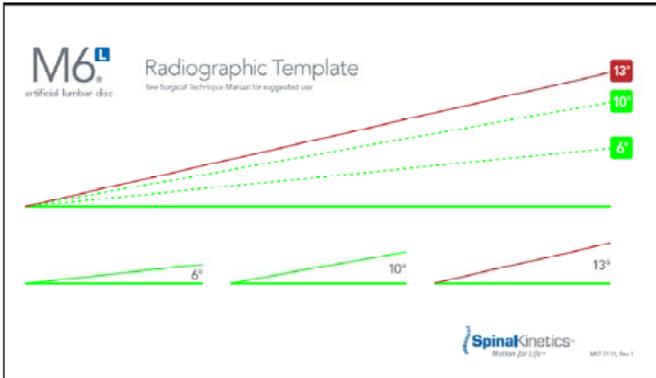


Fig. 3 - Lumbar disc space angle template

Disc Space Height and Mobilization

Distraction and mobilization of the disc space are important factors in achieving optimal outcomes in all cases. A 10mm disc needs to have 10mm of posterior distraction, and a 12mm disc needs to have 12mm of posterior distraction. This is easily verified by use of the 10-12mm discectomy blocks.

If a patient with an index level disc height of < 5mm is considered for implantation of the M6-L device, full posterior mobilization is critical. While always required, use of the paddle distractor and distraction spacers to facilitate mobilization becomes especially important. Insufficient posterior mobilization may affect proper posterior device placement creating excessive disc angles. This could lead to a limited range of motion and high shear forces.

Device Angle Selection

The M6-L device is available in 3°, 6° and 10° angles (Fig. 4). The angles are split evenly between the 2 outer endplates (eg. a 3° disc is angled at 1.5° on each outer endplate).

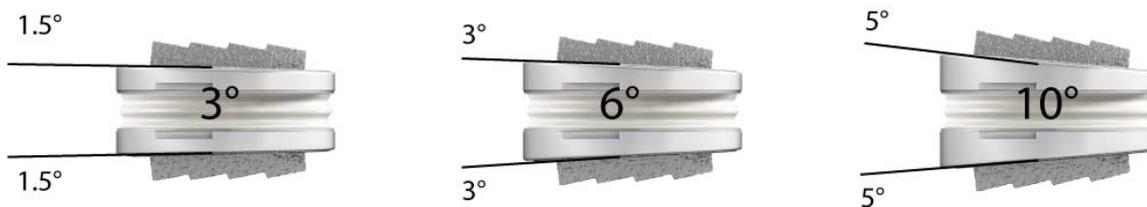


Fig. 4 – Available M6-L disc lordosis angles



The goal of proper device angle selection is to achieve as close to parallel inner endplates as possible (Fig. 5). Ideally, the selected M6-L disc angle should be within 3° of the pre-operative index level disc angle (Fig. 6). If this is not achieved, limited range of motion in extension and high shear forces may occur.

M6-L Disc Angle	Recommended Range of Index Level Disc Angle
3°	0-6°
6°	3-9°
10°	7-13°

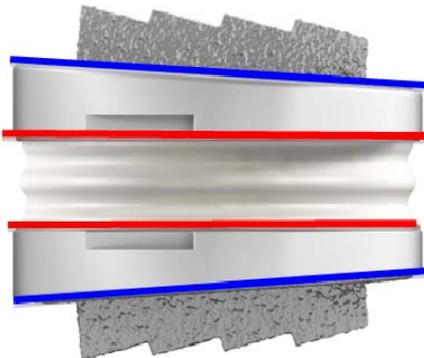


Fig. 5 - **Blue lines** = device lordosis
Red lines = parallel inner endplates

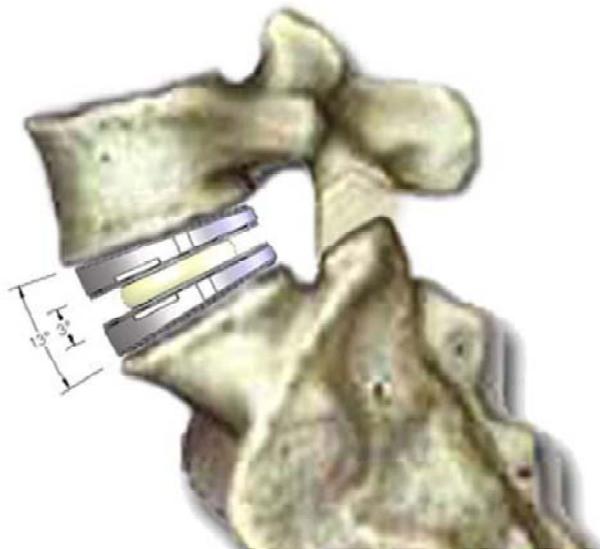


Fig. 6 - Acceptable 10° device angle in 13° space; close to parallel endplates

Conclusion

Evaluations of index level disc angle and index level disc height are important factors when selecting a patient for implantation of the M6-L device. If a patient with an index level disc angle of > 13° is implanted with the device, it may be impossible to achieve sufficiently parallel inner endplates to allow a maximum range of motion.

If a patient with a disc height of < 5mm is selected for implant, it may be difficult to position the device in the optimal posterior position. For patients with a disc height of < 5mm, it is important to achieve adequate posterior mobilization.

Implantation of the M6-L device in the proper posterior position, with endplates as parallel as possible, provides optimal biomechanics, maximum range of motion and minimal shear forces.