Constraint PE Insert for the HI Cup
Constraint PE Insert for the HI Cup

Recurrent dislocations of hip prostheses are serious complications that require special treatment strategies and implants. A constraint PE insert is available for the HI cup which is designed to achieve an increased dislocation stability. In the presence of insufficient soft-tissue tension, the use of constraint PE inserts can increase the dislocation safety. However, in contrast to the asymmetric insert, the impingement-free movement interval is reduced by premature contact of the prosthesis neck.

Function

The constraint PE insert extends beyond the cup entry plane and is, therefore, conically reinforced. This geometric alteration causes the retaining effect of the insert on the ball head.

The publication Experimental analysis of standard, asymmetric and constraint liners for total hip replacement by Bader et al. demonstrated that in both insufficient soft-tissue tension and hip abductor muscles the resulting holding forces of the head in the constraint PE insert can provide a passive retaining function of the head in the cup and, thereby, an increased dislocation stability.
Constrained liners have been designed as an option to control postoperative dislocation. According to the literature, constrained inserts may increase the dislocation stability in following cases:

- Insufficient soft tissue tension
- Multiple failed revisions for instability
- Unidentifiable case of hip instability
- Cognitive or neuromuscular disorder
- Failure of alternative therapies such as repositioning of the implants
- Failed non-operative management

However, constraint inserts exhibit clear movement limitations. Therefore the use of a constrained liner should be carefully considered and only be used in exceptional cases.

Please note that this list is not complete. The final decision whether a constraint liner is used or not is in the surgeon’s hands.

The constraint PE insert leads to a more difficult surgical technique, since coupling the ball head into the constraint PE insert requires a greater use of force.

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**HI Constraint PE inserts**

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**PE inserts for HI LUBRIMET®**

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* revision insert
Notices Concerning the Surgical Technique

In addition to the standard surgical technique for the HI cup, the following notices should be observed. When using a constraint PE insert, the usual trial repositioning with the trial ball head cannot be performed, since it would immediately snap into place. Therefore, the standard trial insert must be used with the trial ball head to determine the correct neck length. Only then is the final constraint PE insert introduced.

1. Introduction of the trial insert
2. Determination of the correct neck length with the trial ball head
3. Manual placement of the constraint PE insert
4. Using the internal rod of the inserter/impactor and the corresponding standard impactor head the constraint PE insert is driven into the cup (a hemispheric impactor head would snap into the constraint insert). An audible change in the accompanying sound confirms the final anchoring of the insert in the cup.
5. Placement of the original ball head on the neck cone
6. Repositioning with the original ball head. The ball head is applied to the entry plane of the insert until it snaps into place.

Important:
Beforehand, the insert must be cleaned with a dry swab and all fluid must be removed. Any fluid that remains in the insert makes the repositioning impossible.

Repositioning is performed by flexing and abducting the leg. During this process, it is also possible to exert additional pressure on the knee joint.

7. After repositioning the ball head in the insert, tension exerted by means of a single-toothed retractor must be used to check whether everything has completely snapped into place.
8. Multiple repositionings and dislocations reduce the retaining effect!
Range of Motion (ROM)

Flexion/extension ROM of the HI constraint PE insert in comparison to the HI standard PE insert, when combined with a POLARSTEM™ stem and an OXINIUM™ femoral head (Figure 1).

Note that the values were calculated using the recommended optimal orientation of the shell:

- Cup orientation: 45° inclination, 15° anteversion
- Stem orientation: 0° abduction, 0° external rotation

Note the following

- The HI constraint PE inserts lead to a lower ROM when compared to HI standard PE inserts.
- For the same femoral head offset, a femoral head with larger diameter results in a better ROM.
- The Metal/OXINIUM femoral heads with neck length XL/XXL (+12/+16) have a skirt that leads to a lower ROM, compared to Metal/OXINIUM femoral heads of smaller neck length or ceramic femoral heads (which do not have a skirt).


