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## **Does The Pre-Operative CCD-Angle Have An Impact On The Outcome Of A Calcar Guided Short-Stem?**

Orthopaedics / Pelvis, Hip & Femur / Joint Replacement - Primary

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### **Introduction**

Calcar guided short-stems follow the individual anatomy of the calcar. In hips with low CCD-angle these stems show a marked varus position which may cause concerns of future migration and failure.

### **Objectives**

The purpose of this prospective study is the analysis of CCD-angle dependent behavior of a calcar guided short-stem in a two year follow up.

### **Methods**

Using an antero-lateral approach a total of 216 optimys short-stems (Mathys Ltd, Bettlach, Switzerland) were implanted. Patients were allowed full weight-bearing. Clinical and radiological follow-up was performed directly postoperative, 6 weeks, 6 month, 1 year and 2 years after surgery. Cases were divided into three groups according to the preoperative CCD-angle (smaller and  $125^{\circ}$ ;  $126-135^{\circ}$ ;  $136^{\circ}$  and greater). Subsidence, change of CCD-angle postoperative and failure rate were evaluated.

### **Results**

One patient had to be revised due to early infection with change of head and inlay. Revision was successful without stem revision. In the whole series no stem failure was observed. Migration was little (in the mean less than 1mm) and occurred mainly at follow-up 6 weeks postoperatively. There was no migration observed at 1 and 2 years control. Migration in the low CCD group was significantly less compared to the  $126^{\circ}-135^{\circ}$  and the high CCD group (32% / 57% / 48%) (p-value = 0,036). The average preoperative CCD angle was  $131^{\circ} (\pm 6.6^{\circ})$  whereas the planned CCD also was  $131^{\circ} (\pm 2.9^{\circ})$ . Postoperative CCD was  $134^{\circ} (\pm 5.1^{\circ})$  in the mean, decreasing to  $132^{\circ} (\pm 4.2)$  after 6 weeks and  $131^{\circ} (\pm 4.4^{\circ})$  after 6 month with a stable state at 1 and 2 years.

### **Conclusions**

Mean migration is little with less than 1mm in total and 1.5mm in those cases where migration was observed. In contrast to the presumption migration was significantly smaller in the low CCD group compared to the group of CCD-angle  $126^{\circ}$  and higher. The postoperative CCD-angle increased in the mean by  $3^{\circ}$  compared to preoperative. At 6 weeks follow-up the CCD angle is reduced the same amount and remains stable in future controls. There appears to be no difference between CCD- angles preoperative and at last follow-up. Thus, the investigated, calcar guided short-stem showed a high precision in CCD reconstruction and a high reliability in mid-term follow-up.