

## Hipstress After Bilateral Periacetabular Osteotomy Based On Medialisation Of The Hip Centre

Orthopaedics / Pelvis, Hip & Femur / Joint Preserving Surgery

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Keywords: Hip Dysplasia, Bilateral Periacetabular Osteotomy, Hipstress

### Background

Periacetabular osteotomy (PAO) is accepted as a golden standard for treatment of acetabular dysplasia in adults. Its goal is to reduce hip-stress by improving the coverage of the femoral head.

### Objectives

Medialization of the acetabular fragment during PAO is believed to be the key to success. The reduction of the inter-hip distance achieved by the medialization of the hip center could have significant beneficial effect on the hip-stress.

Our hypotheses were:

1. The hip-stress is reduced after PAO based on medialization of the acetabular fragment.
2. The hip-stress is further reduced on the same (first operated) hip after PAO is done on the contralateral side.

### Study Design & Methods

The parameters to calculate the hip force and the hip-stress were measured from the AP standing radiographs of 52 patients with bilateral acetabular dysplasia who underwent two stage bilateral PAO with medialization of acetabular fragments (ref.: Hip-stress model by Igljic-Kralj V. et al.). The hip force and the hip-stress obtained after correction on the first operated hip were compared to the hip force and the hip-stress prior correction. Further alteration of the hip force and the hip-stress on the same (first operated) hip was checked after correction on the contralateral hip in the second stage. Statistics were done using paired T-test with p value of less than 0.05 reporting statistical significance.

### Results

After PAO performed on the first hip, several parameters included in calculation of the hip-stress improved significantly on the operated side; the average CE angle increased from 15.27° to 26.37°, the average inter-hip distance (I) decreased from 197.66 mm to 194.27 mm and the average width of the pelvis (C) increased from 45.38 mm to 47.32 mm. The hip force was reduced significantly as was the hip-stress, later by 42% in average. Further significant reduction in I (to 191.6 mm in average) and significant increase in C (to 48.91 mm in average) were obtained on the same, first operated hip after correction on the contralateral side. Against our expectations, hip force and hip-stress did not improve further, after PAO was performed on the contralateral hip.

### Conclusions

PAO based on medialization of the acetabular fragment improves biomechanical properties of the hip significantly. It reduces both, the hip force and the hip-stress in the operated hip.

Hip force and the hip-stress are not further reduced significantly after PAO performed on the contralateral side although improvement of some biomechanical properties is achieved by medialization of the contralateral acetabular fragment.