Author’s response to reviews

Title: Relations between the Crowe Classification and the 3D Femoral Head Displacement in Patients with Developmental Dysplasia of the Hip

Authors:

Rongshan Cheng (chengrongshan@sjtu.edu.cn)
Henghui Zhang (medzh@163.com)
Willem Kernkamp (wakernkamp@gmail.com)
Jingmao Zheng (635587323@qq.com)
Kerong Dai (krdai@163.com)
Yifei Yao (yaoyifeiyf@gmail.com)
Liao Wang (wang821127@163.com)
Tsung-Yuan Tsai (tytsai@sjtu.edu.cn;evanny.tsai@gmail.com)

Version: 2 Date: 13 Sep 2019

Author’s response to reviews:

Author’s response to reviews

Title: Relations between the Crowe Classification and the 3D Femoral Head Displacement in Patients with Developmental Dysplasia of the Hip

Authors:

Rongshan Cheng (chengrongshan@sjtu.edu.cn)
Henghui Zhang (medzh@163.com)
Willem Alexander Kernkamp (wakernkamp@gmail.com)
Jingmao Zheng (635587323@qq.com)
Kerong Dai (krdai@163.com)
Yifei Yao (yaoyifeiyf@gmail.com)
Liao Wang (wang821127@163.com)
Response to the reviewer reports:

Sakai T (Reviewer 1):

1) The femoral anteversion is not investigated.
Response: Thank you for the insightful comments. We share your interest in the relationship between the femoral anteversion and DDH. We also plan to study the relationship between the femoral anteversion and DDH. However, the limitation of word count does not allow us to include additional information. Besides, the focus of this study is on the relations between the Crowe classification and the 3D femoral Head displacement in DDH patients.

2) The Crowe group II showed the largest average anterior displacement followed by the group III then group I with no significant differences. Why group II?
Response: Thank you for pointing out that this. In the study by Argenson et al. (Argenson et al. 2007, Clin Orthop Relat Res, 40-45), it showed that the Crowe II dysplastic patients have the greatest amount of femoral anteversion. Akiyama et al. reported that femoral anteversion correlated with anterior acetabular coverage and bone deficiency in patients with DDH. The most frequent type of acetabular bony defects among DDH patients locate at the superior and anterior portion of acetabulum (Akiyama et al. 2012, Skeletal Radiol, 1411-1418). According to Crowe’s classification, 50-75% of femoral heads dislocate from true acetabulum in Crowe type II. In other words, a relatively smaller portion of femoral head dislocates from true acetabulum compared with these classified as Crowe type III. When the femoral head further dislocates from true acetabulum among these with Crowe type III, the femoral head goes back to posterior direction due to the resultant of forces of peri-acetabulum muscles. Thus, based on these previous studies, we can understand that patients with type II have the largest anterior bone defects when compared to type I and III.
3) The Crowe group I showed the largest average lateral displacement followed by the group III then group II with no significant differences. Why group I?

Response: In patients with Crowe type 1 dysplasia, the femoral head is still inside the true acetabulum. As osteoarthritis progresses, the peri-acetabular osteophytes can grow at the medial side of the femoral head as well as acetabular fossa (Madadi et al. 2013, Int Orthop, 1007-1011). We think that this, in part, can explain why the largest average lateral displacement is in the patients with Crowe type 1 dysplasia. Patients classified as Crowe type II and III have already partially dislocated from the true acetabulum, and they tend to dislocate anteriorly. While femoral heads of Crowe type I are well contained in the true acetabula, lateral direction could be the direction of less resistance force.

Ali Biçimoglu (Reviewer 2):

1) A well designed and written study which needs further English re-write. It can be acceptable after language revision.

Response: According to your request, we have revised the language of this article.