Reviewer's report

Title: Biomechanical optimization of different fixation modes for a proximal femoral L-osteotomy

Version: 2 Date: 11 March 2009

Reviewer: Susan Renner

Reviewer's report:

Minor Essential Revisions:

Figures 5 and 8 would be much clearer if a color image was provided.

Figure 7 needs to have a title on the graph itself.

It would be helpful if an image was included that shows the mesh used in the models.

In the discussion section, first paragraph, second sentence the word ‘exist’ is repeated. “Many surgical procedures exist for treating these patients exists, but ….” Consider revising to “many surgical procedures exist for treating these patients, but …”

In the finite element model the screw threads and tips are not modeled for simplicity sake. It would be very interesting to include those threads and determine if any changes would be seen in the stresses produced. This may not be necessary for publication, but some discussion of this in the paper would be a good inclusion.

Major Compulsory Revisions:

Model development: The models used are described as a solid model of the left and right femurs of a patient with hip dysplasia. It is unclear if both the cortical bone and trabecular bone structures of the femur were modeled (a figure would be very helpful to explain this). It seems from the description given in the text and in the material properties used that the femur was considered as a single solid material. This is not the case in vivo where the femur is a heterogeneous, anisotropic composite material.

If indeed the models considered the femur as one homogenous isotropic material this is a serious limitation to the study. This needs to be clearly stated and discussion of what affect this may have on relating the results predicted by the current models to a clinical situation must be included in the manuscript.

If the model is not of a single solid material this should be made clear in the description of the model in the methods section. Again, a figure showing the mesh used would be very helpful here.

Model validation: It is unclear from reading the text if the model is validated for
the intact condition (without osteotomy) or for the osteotomy condition. This should be stated more clearly.

If the model was validated only for the intact condition what confidence to the authors have that the model is valid and relevant for use in investigating the osteotomy condition? This should be discussed as a limitation to the study and its potential effect on the results discussed.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.