Reviewer's report

Title: Computer-aided individualized resection and endoprosthesis reconstruction of malignant bone tumors around the knee

Version: 2 Date: 18 June 2013

Reviewer: KC Wong

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Major compulsory revisions

Authors reported their early results of using computer-aided planning in bone tumor resection via a cutting guide and reconstruction with allograft-custom prosthetic composite.

1. Authors have not defined clearly their research question. Readers are keen to know
   A. why they used allograft-custom prosthetic composite for bone reconstruction but not other viable alternatives such as modular / custom massive endoprosthesis;
   B. what are the existing problems in reconstruction with allograft-prosthetic composite that may be improved with the suggested computer assisted approach;
   C. why they used semiconstrained knee design with collateral ligament reconstruction instead of rotating hinge knee design that is common in bone tumor reconstruction around the knee.

2. At “Materials and Method”, patients included in the study were different from that stated in Table I. However, in Table I, no patients had pelvic, humerus and radius tumors and two patients had benign giant cell tumor of bones.

3. Patients with high grade osteosarcoma had preoperative chemotherapy. It will be useful to elaborate the timing of planning, custom prosthesis design and manufacturing prior to their definitive surgery.

4. Author should add some parameters to determine the accuracy of the approach. Postoperative Xray certainly cannot validate the accuracy of a 3D planning. Clear resection margin in the specimen is important for oncological result but it may not necessarily represent the achieved resection is equal to the planned.

5. The complications in allograft reconstruction and functional score such as Musculoskeletal Tumor Society (MSTS) score should be recorded.

6. For “Discussion”, authors should compare and contrast their results with the published data, so readers know what additional information they can get from the paper.
   A. As results were not quantified into assessment parameters, comparison with
the published data cannot be well addressed.

B. The advantages of their approach mentioned at “Discussion” (page 13) were not adequately shown by the results and they were only described as the potential benefits of their technique.

C. The allograft healing was relatively not relevant to the aim/result of the study.

D. Limitations of the work were not mentioned.

Although the described approach is technically feasible with good potentials, it is better to define more clearly the research questions and assess the problem with some quantifiable parameters for easy comparison.

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

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests