Reviewer's report

Title: Non-invasive Monitoring of Tissue Oxygenation During Laparoscopic Donor Nephrectomy

Version: 1 Date: 18 December 2007

Reviewer: Patrick Luke

Reviewer's report:

In the manuscript entitled NON-INVASIVE MONITORING OF TISSUE OXYGENATION DURING LAPAROSCOPIC DONOR NEPHRECTOMY, the authors intended to validate a real time in vivo assay to assess kidney oxygenation in a porcine model during open nephrectomy and then during laparoscopic donor nephrectomy in humans. For that, they used the 3-CCD camera to monitor the qualitatively renal parenchymal oxygenation. Using a software, the blue CCD response was subtracted from the red one to give a score that was correlated with biologic oxygenation parameters on pig and then assessed under human laparoscopic condition. The beauty of this technique is that we do not need extra piece of equipment but just the appropriate software to make these analyses. This article describe the technique and correlation with organ saturation oxygenation.

Major comments:

1. The validation of this new technique was performed on porcine model, during open surgery, using decreasing FiO2 to validate the correlation between organ oxygenation and ROI results from the CCD. From that point on, this method was applied to human laparoscopic donor nephrectomy (LDN) in nine patients. It would have been more important to validate the technique with a laparoscopic porcine approach using increased pneumoperitoneum pressures or some other positive control such as progressive hilar clamping. As well, does a bloody laparoscopic field associated with more important bleeding change the red CCD response and the ROI values? Also, regional vasoconstriction associated with manipulation-related or drug-related (catecholamine) vasospasm has not been assessed with this setting; the only factor that was assessed was variation of O2 content based on FiO2 variations. It is not clear whether the current technology can accurately assess these important factors. It is also not clear whether organs with decreased ROI had any differences in immediate graft function vs. those with higher ROI. Therefore, there are problems with study design.

Minor comments:

1. In the abstract section, ROI should be identified as region of interest and then add the abbreviation.
2. What is the basis underlying the oxygenation monitoring and CCD? I feel that very few details about the theory where provided to the readers. Is it based on
red light emission based on temperature and blood perfusion intensity or is it based on red emission based on highly-oxygen saturated hemoglobin? A paragraph or sentence could explain this.

3. The authors need to discuss the clinical utility of this test during LDN. For example, if ROI is reduced, what is the consequence, what is the therapy?

4. The conclusion section is too long.

Overall, I feel it is an interesting and novel concept. However, study design and clinical relevance reduce the impact of this paper.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

i declare that i have no competing interests