Reviewer's report

Title: Cardiopulmonary Bypass Has a Modest Effect on Cancer Progression in a Retrospective, Population-based, Propensity Score Adjusted Cohort Study.

Version: 2 Date: 30 July 2013

Reviewer: Akihiko Usui

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Authors designed a clinical study to clarify the hypothesis that the use of cardiopulmonary bypass (CPB) may cause a transient immunosuppression with the potential to promote the spread and growth of coexisting cancer cells. A retrospective cohort study of cancer risk, stage, and mortality in 43,347 patients who underwent coronary artery bypass graft (CABG) surgery with and without CPB in New Jersey between 1998-2004 was conducted. The study revealed that an increased risk for overall cancer incidence and cancerspecific mortality did not reach statistical significance. An increased risk of skin melanoma and lung cancer was only observed for patients with pump versus off-pump open-heart surgery. Authors concluded that these results suggest that there may be a relationship between CPB and cancer progression, however, the effect is likely modest at most.

This clinical study is a retrospective but large scale study. I think this study may contribute higher evidence level about the effect of cardiopulmonary bypass on the cancer prognosis. But I think this study design has serious faults.

Objects of this study are patients who were diagnosed cancer after CABG surgery. Patient with prior cancer diagnosis were excluded in this study. This study design may clarify the effect of cardiopulmonary bypass to increase of cancer incidence after CABG surgery. But the effect of cardiopulmonary bypass on patients who have cancer on CABG surgery is not observed. I think Journal readers want to know the effect of cardiopulmonary bypass to cancer prognosis on patients with any cancer.

1. Patients who were diagnosed cancer within 1 year prior to CABG surgery should be added and be analyzed statistically.

2. Patients who were diagnosed cancer simultaneously to CABG surgery should be added and be analyzed statistically.

3. Patients who were diagnosed cancer more than 1 year after CABG surgery are no meaning to this study. They should be deleted.

Level of interest: An article of importance in its field

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' below.