Author’s response to reviews

Title: Blood Consumption in Total Arterial Coronary Artery Bypass Grafting

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Version: 1 Date: 10 Dec 2019

Author’s response to reviews:

Reviewer # 1:

1) Q: The sentence concerning with the lines 69-73, may be revised as "While the first randomized trial on CABG survival at 10 year between BIMA and SIMA, the Arterial Revascularization Trial (ART), still awaits its outcome data, the analysis of clinical and safety outcomes after 5 years shows no significant differences in the rates of death, stroke or myocardial infarction between the bilateral- and single-arterial graft groups."

R: Thank you for your comments and your suggested changes to the abovementioned sentences. We agree with the suggested changes and adapted the wording accordingly. The changes to the manuscript are marked in red in the word file.

2) Q: The sentence concerning with the lines 96-97, may be revised as "We excluded patients with single-vessel coronary artery disease (N=40) since these patients were commonly only grafted with a single conduit."

R: Thank you for this remark, we adapted the wording as you suggested.

3) Q: The sentence concerning with the lines 101-104, may be revised as "Within our study population, patients were attributed to two groups. The group undergoing total arterial CABG
includes patients who were revascularized using exclusively BIMA conduits (N=419) and the mixed CABG group includes patients who received a composition of SIMA and SV conduits (N=176)."

R: Thank you for this comment. We agree with the suggested changes and adapted the manuscript.

4)

Q: The sentence concerning with the lines 134-135, may be revised as "No sealant at all was used for hemostasis and clipping was preferred for bleeding control whenever possible."

R: We thank you for this suggested change. We consent with your suggestion and changed the text accordingly.

5)

Q: Concerning with the lines 172-173, the term of "anticoagulation" may be replaced with the term of "anticoagulation and antiaggregation regimen". Concerning with the line 212, the term of "anticoagulant" may be replaced with the term of "anticoagulant and antiaggregant". Concerning with line 260, the term of "anticoagulation scheme" may be replaced with the term of "anticoagulation and antiaggregation scheme". In table 1, the variable of "anticoagulation" may be as "anticoagulation and antiaggregation"

R: Thank you for this important remark. We agree that anticoagulation and antiaggregation should always be differentiated and adapted the text accordingly.

Reviewer # 2:

1)

Q: Is there any timeframe difference between mixed and BITA groups? I mean, if mixed grouped was performed years before switching to the BITA strategy?

R: Thank you for this essential remark. In both study groups, the operations were performed over the same time interval and we did not significantly change our grafting strategy. The aim to use IMA grafts whenever possible was established beforehand and the grafting mainly depended on IMA graft quality and length (as well as the corresponding heart size).
Q: How the authors define elective status? If elective, so why some patients are under active anticoagulation?

R: The elective status was defined as a planned operation without any preceding medical condition that would have required the CABG procedure in order to prevent permanent disability or death.

A preoperatively established single antiaggregation (either acetylsalicylic acid or ADP-receptor inhibitor monotherapy) was continued throughout the perioperative period, according to current recommendations. A double antiaggregation was only continued if it was essential due to a recently performed vascular intervention (e.g. previous coronary/ peripheral/ cerebrovascular stenting) and was an individually discussed with the consulting cardiologists or interventional radiologists.

A total of 3.5% of all patients were under active anticoagulation at the time of the operation. These cases either included patients with a high risk of thrombosis due to hematologic disorders or (mostly) patients who did not pause their anticoagulation in the defined timeframe before the operation. In these few selected cases, the operation was not postponed if the residual active anticoagulation was thought to be of no additional risk.

3)

Q: As the authors performed CABG under cardiopulmonary bypass and the mixed group had longer pump time (more distal anastomoses), did the authors checked for the impact of pump time between the 2 groups?

R: Thank you for this important comment. We have now performed an analysis of the association between the pump time and the consumption of blood products. No significant difference in the aortic crossclamp time was found between patients where erythrocyte concentrates were transfused (t=80.2 + 25.4min) and patients who did not require EC transfusion (t=77.9 + 28.2min) (P=0.45). We added these findings in the revised manuscript in the new section on surgical details (lines 185-189).

4)

Q: The arguments advanced by authors to support BITA group in discussion section should be more consistently advanced. One could also stipulate that surgeon familiar with BITA all arterial are more meticulous; did the authors checked the surgeon difference?

R: Thank you for this important remark. We consent that the role of the surgeon and his experience is important regarding perioperative blood consumption. Since this study reports a single-center experience from Switzerland, all selected cases were operated by the last author
(A.K.) or under his supervision. Also the control of hemostasis is always performed by the attending surgeon in our center. We therefore added the following statement in the method section: “In all patients, CABG and the control of hemostasis was performed by the attending surgeon (A.K.) or under his supervision.” in line 133-134. In the discussion we added the following paragraph (lines 255 – 258): “We are convinced that also the surgeon’s experience and meticulousness is a crucial factor for perioperative bleeding and the consumption of blood products. Since in this present study, all operations were performed by or under supervision of the attending surgeon (A.K.), the bias from different surgeons is minimized.”

5)

Q: Please provide more surgical information: the percentage of in-situ BITA, percentage of composite grafting, number of SVG sequential anastomoses.

The statistic methodology stand worth and iconography is appropriate.

R: Thank you for this essential comment. We have included further analyses of the surgical details and added these findings in a separate sub-section of the results (lines 175-189):

“The mean numbers of distal anastomoses were 3.1 ± 0.9 in the total arterial CABG group and 3.9 ± 0.9 in the mixed CABG group (p<0.001). In patients receiving a SV graft, sequential grafting was performed in 68.6% of all patients, with 2 distal anastomoses in 41.8%, 3 distal anastomoses in 20.6% and 4 distal anastomoses in 6.2% of all patients. In 31.4% of the patients receiving a SV graft, only one distal anastomosis was made. Composite grafting was performed significantly more often in patients undergoing total arterial CABG with a total of 200 cases (47.7%), compared to mixed CABG where composite grafting was performed in 8 cases (4.5%, p<0.001). In total arterial CABG, one IMA was used as an in-situ graft in 124 patients (29.6%) and both IMAs were used as in-situ grafts in 286 patients (68.3%).”