Author`s Reply

To the Editor,

Thanks for reading our manuscript entitled "Effect of inflammation on the biomechanical strength of involved aorta in type-A aortic dissection and ascending thoracic aortic aneurysm: An initial research" (1). Because you have asked some questions in the letter, we would like to introduce some more detailed information.

First, you asked if we should compare patients with chronic AD with those with nondissected AA. AD is a critical illness that has a very high mortality rate in its acute course due to aorta rupture, and urgent or emergent surgical treatment should be performed in this phase. As mentioned in the manuscript, the acute inflammation of the involved aorta walls was the main cause of invulnerable aorta and aorta rupture, and it also made graft anastomosis in surgical treatment more difficult. In an earlier article, we had proven that the inflammation biomarkers of AD, such as IL-6 and TNF-a, present time-dependent changes in its course and may rise to their peak levels in a few days after onset and decline slowly to near-normal levels after the acute phase (2). Because AA progress had not involved an intensive inflammation response and the biomarkers were usually in the normal range, we thought that there should be no significant difference between the patients with subacute or even chronic AD and AA, both in the degree of inflammation and the incidence of surgical implications and mortality. Therefore, we declined performing a comparison between them. As you had mentioned, it would be more appropriate to add the comparison of them. We may consider this in future studies.

Second, you mentioned that "the authors did not compare tissue strength after the increase in inflammation in the circulation, as indicated in the aim of the study" and that "there are no data regarding patients with AD with low and high inflammatory responses in the blood to compare this difference in the aortic tissue." For the former, because the involved patients with AD in our

study had already presented a significant inflammatory response both in the tissue and circulation and because the samples were all one-time-point collected, we could not directly compare the change in the tissue strength in one individual before and after inflammation onset. This was also a limitation of our human study. Thus, we had only tested the correlation between inflammation (both in the circulation and vessel tissue) and tissue strength in involved patients, and the significant correlation was shown in the manuscript. For the latter, it is a known fact that there is a chronic inflammatory response in the AD aortic wall before the intima tear, and the implosive acute inflammatory response induced by the blood flow impact occurred after the intima tear. Thus, we thought that all AD-related aortic vessels suffered from severe local tissue inflammation. The following circulatory or systemic inflammation of AD started with the release of inflammation biomarkers from the dissected aorta just after onset, and it might be aggravated by impaired multiple organ perfusion (mainly gastrointestinal tract and kidneys) due to dissection of the entire aorta during AD progress. The severity of circulation inflammation of AD may vary among individuals due to differences in the dissected area or involved organs. In our involved patients, there was no significant impaired organ perfusion due to dissection because no patients suffered from gastrointestinal ischemia and renal failure. However, four of 20 patients suffered from respiratory failure before surgery. Which we thought should be acute lung injury induced by local accumulation of inflammation biomarkers. It was obvious that there were many factors that might have caused uncertainty with regard to a direct correlation between aortic and circulatory inflammation. In such an initial research with a small sample size, we could not eliminate all interference variables; therefore, we declined performing the correlation test. In future research with more patients and more influence factors included, the correlation test might be appropriate.

Because our manuscript was an initial research with a small sample size and simple testing and statistical analysis, the results may sometimes be viewed with subjectivity, one-sidedness, and superficiality. We wish to introduce our research to interested cardiovascular surgeons and researchers, and we accept the criticisms and suggestions of colleagues.

Zhixuan Bai, Jun Gu[1], Yingkang Shi[1], Wei Meng[1]
Department of Cardiovascular Surgery, The Second Affiliated Hospital, School of Medicine, Zhejiang University; Hangzhou-*China*
[1]Department of Cardiovascular Surgery, West China Hospital, Sichuan University; Chengdu-*China*

References

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Address for Correspondence: Wei Meng, MD,
Department of Cardiovascular Surgery,
West China Hospital, Sichuan University;
Guoxue Rd 37th Chengdu-*China*
Phone: +86-028-85422897
E-mail: mengwei_111@hotmail.com