eComment: Influence of cross-clamp duration and pressure on aortic damage

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We read with a great interest the report of Babin-Ebell and associates regarding the influence of the aortic cross-clamping on endothelial integrity during cardiac surgery procedures [1]. Some questions arise regarding this paper.

Could you share some ideas on how it is possible to quantify/determine intraoperatively the pressure applied on the aorta, considering the variability of aortic thickness and conditions of aortic tissue? Since standard available aortic clamps are used, the ‘strength’ of aortic clamping (the clamp cogs engaged) remains empirical and some special tips would certainly be of interest.

What is your vision about clamps with an atraumatic grip? Do you think these clamps can make sense compared with conventional cross-clamping instruments? We employ flexible atraumatic clamps regularly during minimally invasive valve operations and it seems that these atraumatic jaws leave less tracks on the aortic adventitia after declamping, but the conditions of the media and endothelial layer damage remain unrevealed. Also, it is difficult, if not impossible, to have an equal pressure over the jaws with standard aortic clamps, which can be very traumatic especially in plaque-thickened, diseased aortas.

There is no standard aorta, but we can standardize our approach. Unquestionably, cross-clamping remains inevitable for most of the cardiac surgery procedures, but it should be considered, even if the general complexity of a cardiac surgery procedure overshadows some structural disruption and dysfunction of tissues manipulated during a procedure. Further studies are needed to clarify the possible associated clinical risks and new less invasive aortic clamping solutions could positively contribute to the current surgical armamentarium.

Reference


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