

Physician - Experimental Researches

[MSB-15]

Histopathological Comparison of the Effectiveness of St. Thomas II and del Nido Cardioplegia Solutions with Respect to Myocardial Ischemia and Reperfusion in Rats

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Objective: This study aimed to compare the effectiveness of traditional St. Thomas II and the next-generation del Nido cardioplegia solutions in minimizing ischemia/reperfusion injury during open heart surgery in a myocardial ischemia/reperfusion model created in rats.

Methods: In this experimental study, 24 Wistar albino rats were divided into three groups: the sham group (normal saline), the St. Thomas II group, and the del Nido group. Cardioplegia was induced, and heart tissues were collected for histopathological analysis after 90 min. The number of macrophages was counted to assess inflammation.

Results: The mean macrophage count in ischemic tissues was similar across the sham, St. Thomas II, and del Nido groups. In tissues with reperfusion injury, the control group had fewer macrophages compared to the St. Thomas II and del Nido groups, but the difference between the two solutions was not statistically significant.

Conclusion: Both St. Thomas II and del Nido solutions were more effective than the control in preventing reperfusion injury. However, no significant difference was observed between the two cardioplegia solutions, possibly due to the short ischemia/reperfusion duration and the resilient nature of rat myocardium.

Keywords: Del Nido cardioplegia, histopathological examination, ischemia/reperfusion injury, myocardial protection, rat myocardium, St. Thomas II cardioplegia.

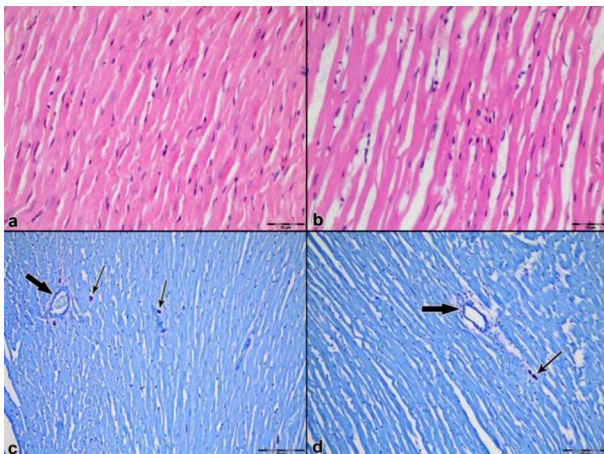


Figure 1. Group 1. a, c: Ischemia group; b, d: Reperfusion group. a, b: Heart tissue stained with hematoxylin-eosin. c, d: Heart tissue stained with toluidine blue. Blood vessel (thick black arrow), mast cell (thin black arrow). a, b: x400, c, d: x200.

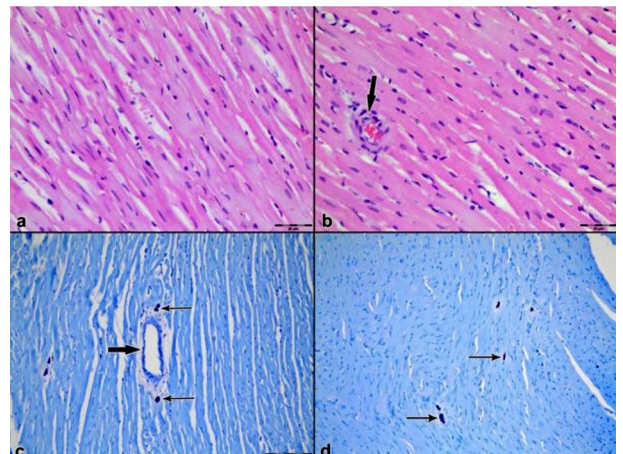


Figure 2. Group 2. a, c: Ischemia group; b, d: Reperfusion group. a, b: Heart tissue stained with hematoxylin-eosin. c, d: Heart tissue stained with toluidine blue. Blood vessel (thick black arrow), mast cell (thin black arrow). a, b: x400, c, d: x200.

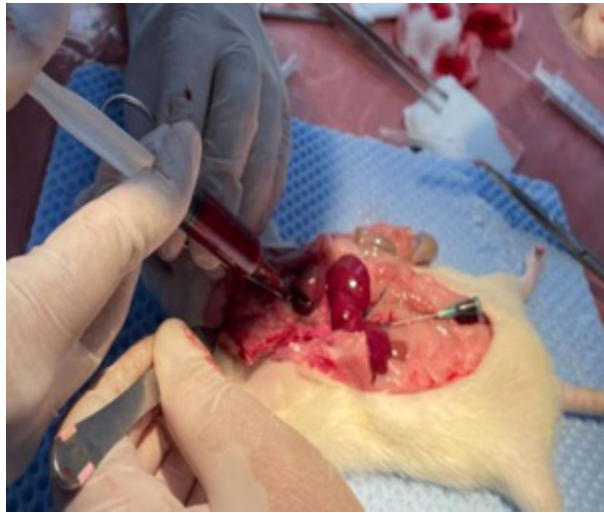


Figure 3. Cross-clamp and cardioplegia application.

Table 1. Assessment of differences in mast cell count by group and time (*One-way analysis of variance, **Paired t-test)				
	Control (n=8)	St. Thomas (n=8)	Del Nido (n=8)	
	Mean±SD	Mean±SD	Mean±SD	p-value*
Mast cell count				
Ischemia	33.4±7.7	33±8.7	34.2±6.1	0.95
Reperfusion	29.1±10.1	34.1±10.4	32.7±7.2	0.55
p-value**	0.02	0.19	0.61	