



# Novel Fast Cold Flushing Cannulation for Transplant Organ Procurement

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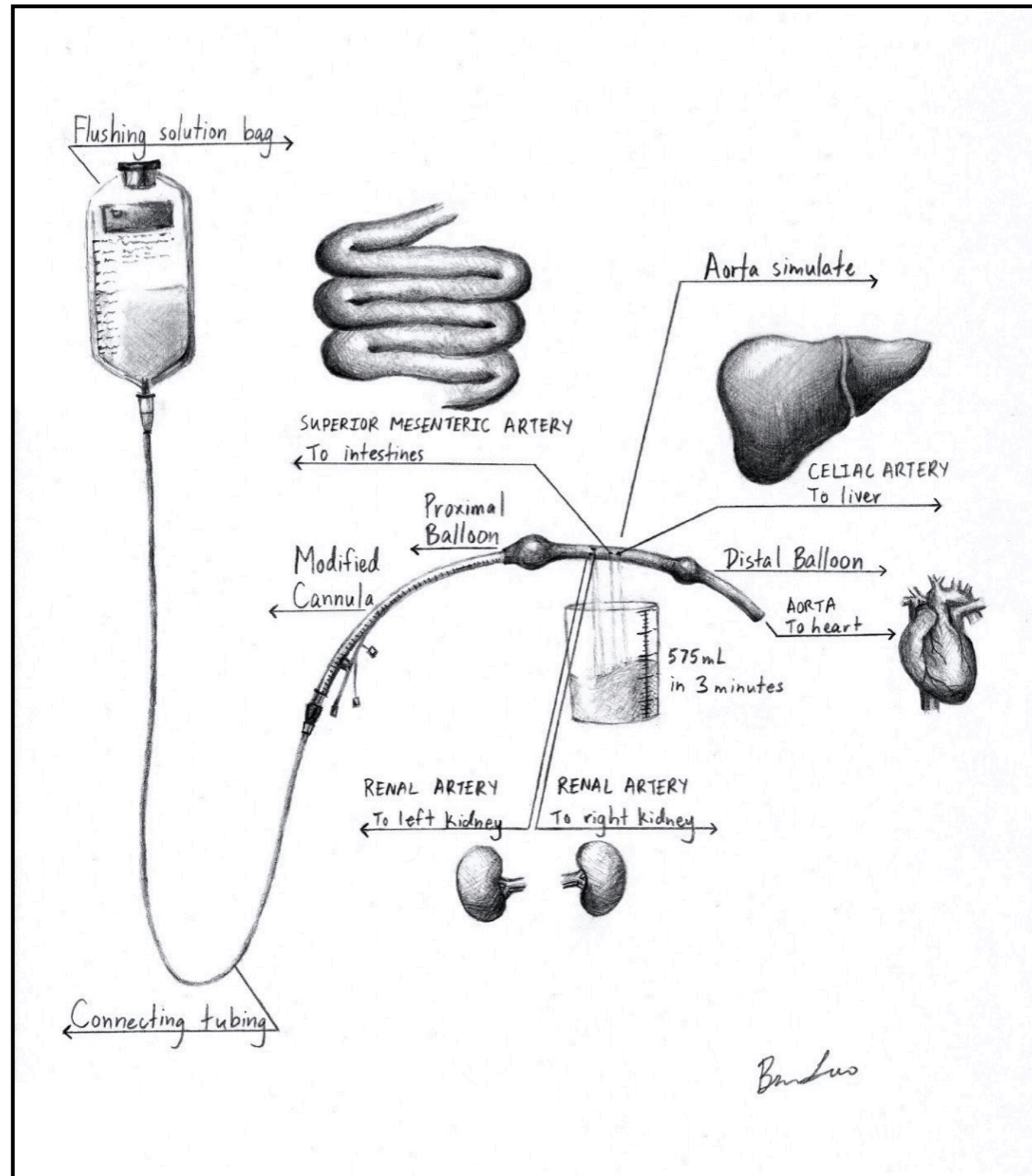
# Introduction

- A reliable and fast cannulation of aorta in organ procurement for transplantation, is critical, especially for DCD (donation after circulatory death).
- By shortening warm ischemia time, a better donor organ quality is expected against delay graft function (DGF up to 60%) and primary non-function (PNF, up to 5%) in post transplant recipients of DCD organs.
- Present study used an in vitro simulate set-up to test the concept of a novel reliable and fast cold flushing cannulation for transplant organ procurement

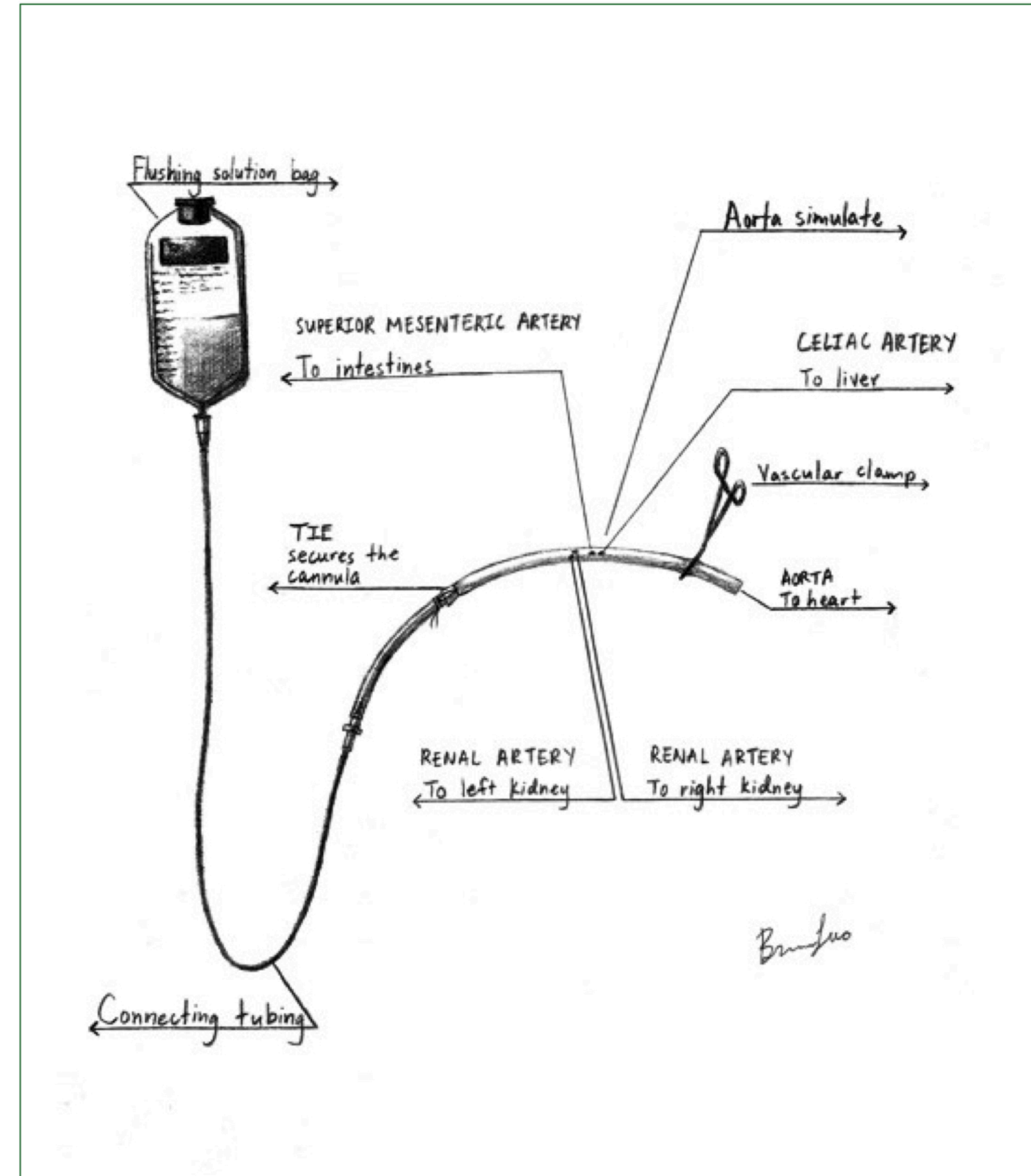
# Method

- a 1/2" Argyle™ Penrose Tubing 20cm long was used to simulate the abdominal aorta with 4 side holes simulating as celiac artery, superior mesentery artery and bilateral renal arteries, while a PHYCON (I.D. 7.0mm, O.D. 10.7/12.5mm ORAL) endotracheal tube was used as a double balloon cannula in study group(Fig 1), and a traditional MAQUET 21 Fr cannula was used in control group(Fig 2).
- In the study group, we inserted the double balloon cannula into the simulate abdominal aorta, inflated both balloons, began flushing for 3 minutes. The fluid flowed out of the simulate aorta side holes was recorded. In the control group, a traditional cannula was inserted into the simulate abdominal aorta, a clamp was placed superiorly above the all side holes, and a hand tie was placed distal to the side holes to hold the cannula in place, Similarly flushing was carried out for 3 minutes and flow volume was recorded. In both groups the tests were performed for 10 times.





**Fig 1. Study Group**



**Fig 2. Control Group**

# Results

- The results shew that the mean time to the start of flushing was 49.6 seconds in the study group and 61.3 seconds in the control group( $P=0.007$ ).
- The results also shew insignificant differences in flow rates between the control group vs study group (620.5ml vs 575ml),  $P =4.1$ ).
- Statistic analysis was performed with anova.



# Results

Test Number	Study Group, Time to start flushing (sec)	Control Group, Time to start flushing (sec)	Study Group, Flow Vol ml/ 3 minutes	Control Group, Flow Vol ml/ 3 minutes
1	44.70	66.39	575	635
2	60.81	56.99	575	600
3	43.11	61.67	575	635
4	46.25	67.38	575	600
5	57.07	64.35	575	640
6	44.18	57.47	575	625
7	44.64	58.14	575	625
8	36.15	56.67	575	610
9	47.60	62.54	575	610
10	71.22	61.72	575	625
<b>Mean</b>	49.57	61.33	575	620
<b>P</b>	0.01		4.07	

# Conclusion

This study proved the concept that a double-balloon cannula might in fact reliably lessen the warm ischemia time, especially when we took into account of time saved in exposing and clamping the upper abdominal aorta.

# References

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