

Technical Note

Flow Value Fluctuations during EC-IC Bypass Surgery

Extracted from an inquiry from Dr. Kawashima of Tokyo Women's Medical University

QUESTION

When using 1.5 mm probe during STA-MCA bypass surgery, the flow values fluctuated between 30 – 70 mL/min when the probe tip was tilted slightly. The signal strength was good all the time. Which value should be considered the true value: 30 mL/min, 70 mL/min or somewhere in between? What might be the cause of these unstable values?

RESPONSE

Any flow reading will either be accurate or perhaps reduced if there is some mechanical blockage. Since there is no way to increase the flow in a vessel with Probe placement, the 70 mL/min measurement is probably the most accurate.

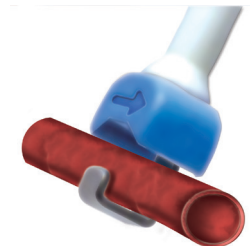
Any vessel that transmits that much flow is certainly not too small for a 1.5 mm Flowprobe. In fact, it is possible that the vessel was tightly positioned in the Probe. If that were the case, any minor manipulation of the Probe head such as the described twisting of the Probe tip would serve to bend the vessel, possibly slowing the flow.

When this situation arises, the best way to proceed would be to measure the vessel with a larger Flowprobe. As long as the vessel fills the Probe reflector area by 75%, and the signal strength is good, the reading will be accurate. The benefit of using a larger Flowprobe would be a greater margin of allowable motion of the Probe head without fear of constricting the vessel.

In regards to the last question on the cause of unstable values, it appears more likely the flows were unstable due to vessel constriction. If the Probe head was turned, and constricted the vessel, flow could easily vary by that much. As long as the Flowmeter is getting a strong signal, it will provide accurate flow readings.



The vessel should fill between 75-100% of the ultrasonic window (lumen between the Probe body and the reflector).



The vessel should be aligned horizontally with the body of the Flowprobe as shown.