Quantitative Patency Assessment

Steps for Successful Flow Measurement during Creation of a Microvascular Anastomosis

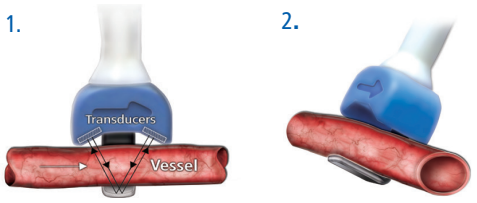
Measure baseline flow in the native vessel prior to any surgical manipulation:

1. Select the appropriate size Flowprobe. The vessel should fill 70-100% of the probe-sensing window (Figs. 1,2).
2. Clear approximately 1 cm of the vessel to be measured of extraneous tissue (i.e. fascia, fat) for an accurate measurement. This should provide adequate room for the probe head. Fat could interfere with acoustic transmission.
3. Fill the Flowprobe window with ultrasonic gel or submerge the Flowprobe head in saline in the surgical field.
4. Apply the Flowprobe at right angles to the vessel (Figs. 1-4). Take extra care not to "twist" or "lift" the vessel with the Flowprobe. This will restrict or occlude blood flow creating inaccuracies at such small flow values.
5. Check the Flowprobe's ultrasonic signal strength on the Monitor display or Flowmeter front panel.

   Once a repeatable, reproducible flow waveform is seen (Fig. 5), the Probe, Meter and Monitor combination has sensed volume flow through the vessel.
6. When the waveform appears stable (10-15 seconds), assess the mean flow value and either take a snapshot of the measurement, make a recording, or print the waveform with associated mean flow.
7. Leave the probe on the vessel until the printing stops or a snapshot or recording has been captured (8 – 10 seconds).

Measure flow after creation of a vascular anastomosis.

1. Re-measure volume flow following the above steps at a site distal to the anastomosis Do not measure flow directly over the anastomosis. Suture material will interfere with acoustic coupling (Fig. 4).
2. If flow is less than expected, consider:
   - Technical error in anastomosis creation
   - Poor run-off (increased resistance in the vascular circuit)
   - Vasospasm, kinks or twists
   - Drop in MAP
   - Change in body temperature



Figs. 1,2: Front and side view of optimum vessel positioning within the ultrasonic window of a Transonic Microvascular Flowprobe.

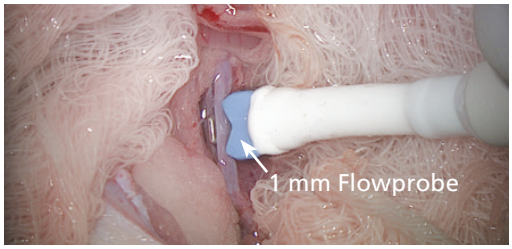


Fig. 3: Microvascular Flowprobe applied to rat aorta.

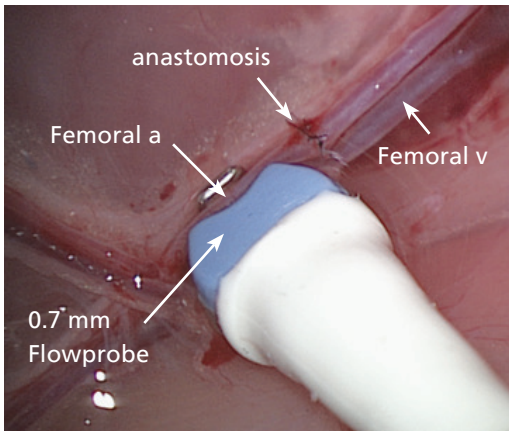


Fig. 4: Microvascular Flowprobe on rat femoral artery.

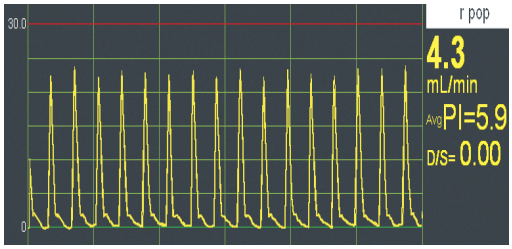


Fig. 5: Waveform of Flowprobe on popliteal artery.

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