Flow-assisted Surgical Techniques and Notes* Robotic IMA Harvesting CABG Protocol

Drawn from the surgical expertise of Francis Sutter DO, Lankenau Hospital, Philadelphia, PA

*Flow-Assisted Surgical Techniques ("F•A•S•T") and Protocols are drawn from surgical experiences by transit-time flow measurement users and passed along by Transonic for educational purposes. They are not intended to be used as sole basis for diagnosis. Clinical interpretation of each patient's individual case is required.

Introduction[5]

During hybrid coronary artery bypass grafting (CABG) surgery a surgeon may elect, following robotic internal mammary artery harvesting and its anastomosis to a coronary artery, to use a Coronary Flowprobe to measure blood flow through a bypass graft to objectively assess its anastomosis to a coronary artery and detect any unseen blood flow obstructions. This ability to correct otherwise undetectable flow restrictions on the spot provides a surgeon with an opportunity to improve patient outcomes.

Measuring Bypass Blood Flow[1,2,3]

1. Select Correct Perivascular Flowprobe Size

Measure the diameters of the vessel(s) to be measured with a gauge before opening the Flowprobe package. Select a Flowprobe size so that the vessel will fill between 75% - 100% of the Flowprobe's ultrasonic sensing window.

2. Prepare Vessel for Flowprobe

Determine the optimal site for applying the Flowprobe by selecting a site wide enough to accommodate the Perivascular Flowprobe's acoustic reflector. Clear approximately 1 cm of the vessel to be measured of extraneous tissue (i.e. fascia, fat).

3. Add Couplant to Flowprobe

Fill the Flowprobe's window with ultrasonic gel or submerge the Flowprobe head in saline in the surgical field.

4. Apply Flowprobe

Apply the Flowprobe at right angles to the vessel taking care not to "twist" or "lift" the vessel with the Probe. Apply the Flowprobe so that the entire vessel lies within the ultrasonic sensing window of the Flowprobe

5. Check Signal Strength

Check the Flowprobe's ultrasonic signal strength on the the Flowmeter's Signal Quality Indicator. If acoustic contact falls below an acceptable value, an acoustic error message will be displayed.

6. Measure Flow

7. Access Flow per CABG Patency Assurance Program[3]

8. Document Flows for Case Record, if Desired

Document flow values. If the a negative flow is displayed, press the INVERT button to change the polarity before printing the waveform.

References

1 Measuring PeriFlowprobe(CV-180-mn)RevA2018USltr
2 AU-QRG-Optima-EN Rev E
3 CABG Graft Patency Assessment Handbook (CV-50-hb) Rev B, 2014
4 Gobran SR, Sutter FP *et al,* "Outcomes after usage of a quality initiative program for off-pump coronary artery bypass surgery: a comparison with on-pump surgery," Ann Thorac Surg 2004; 78(6): 2015-21. (Transonic Reference # 3025AH)
5 Photo Case Study: Courtesy of Francis Sutter OD, Chief, Dept. of Cardiothoracic Surgery, Lankenau Hospital, Philadelphia, PA

Robotic Cardiac (CV-317-mn) Rev C 2019 USltr

Bypass Graft Flow Measurement[5]

Prepare patient for surgery and insert endoscopic instruments into the patient's thoracic cavity and adjust camera angles and images. (Figs. 1,3 on reverse side)

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Harvest the Left Internal Mammary Artery with the da Vinci Robot (Fig. 2 on reverse side)

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Through a small incision in the chest, prep the harvested IMA for anastomosis (Figs. 5,6 on reverse side))

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Sew the harvested IMA to the LAD through the small incision (Figs. 7-9 on reverse side))

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Measure bypass graft flow with the Flowprobe inserted through the small opening in the patient's chest. (Fig. 10 on reverse side)

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Record flow by pressing PRINT on the Flowmeter or record and take a snapshot on the AureFlo. (Fig. 11 on reverse side)

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Close incision in patient's chest. (Fig. 12)

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Robotic IMA Harvesting CABG Protocol cont.[5]

Fig. 1: Endoscopic instruments inserted in ports in patient's thoracic cavity.

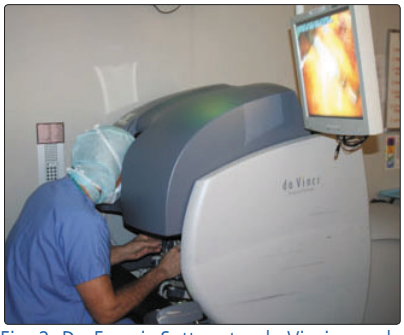

Fig. 2: Dr. Francis Sutter at a da Vinci console harvesting the Internal Mammary Artery (IMA) robotically.

Fig. 3: Assistant at operating table adjusting endoscopic video camera.

Fig. 4: Video screen close-up.

Fig. 5: Back at the operating table, prepping the harvested IMA.

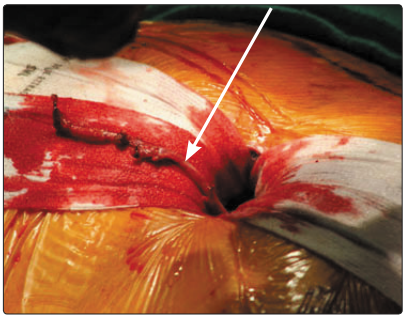

Fig. 6: Exposing the IMA graft.

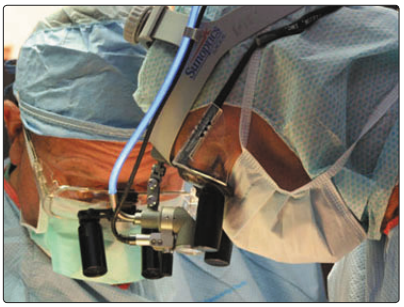

Fig. 7: Team concentration as the surgeons sew the harvested IMA to the LAD.

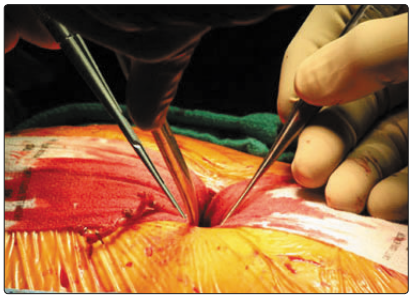

Fig. 8: Anastomosing IMA to the LAD coronary through the camera port.

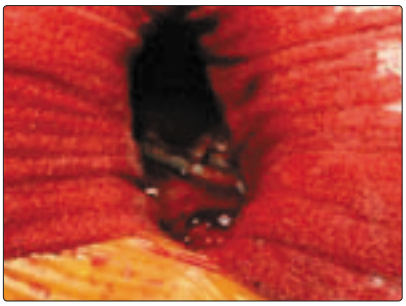

Fig. 9: View of IMA - LAD anastomosis.

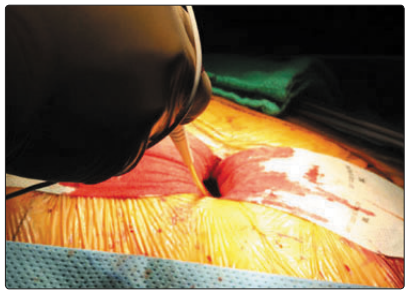

Fig. 10: Measuring IMA flow with flowprobe inserted through port.

Fig. 11: Good IMA graft flow: 63 mL/min.

Fig. 12: Measuring 1 1/2 inch incision in 85-year-old patient.