

Influence Of Coronary Artery Diameter On The Pattern Of Bypass Volumetric Blood Flow Curve According To Intraoperative Ultrasonic Flowmetry Data In Patients Undergoing CABG

Vladislav Vasilev¹, Dmitrii Petrovskii¹, Shohruh Mukimov¹, Andrey Shiryaev¹,
Damir Galyautdinov¹, Ruslan Latypov¹, Renat Akchurin¹

1 - Federal State Budgetary Institution «E.I.Chazov's National Medical Research Center of Cardiology» Ministry of Health of the Russian Federation,
Moscow, Russia

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**We have no conflict of
interests**

Operating microscope

Since 1985 in our center more than 9.000 operations were performed

- Pros:
 - The same operating field
 - Great zoom (up to x12)
 - Good visualisation of damaged vessel wall
 - Translation of whole process on screens
 - Possibility of making pictures and videos during operation



Operating microscope

Since 1985 in our center more than 9.000 operations were performed

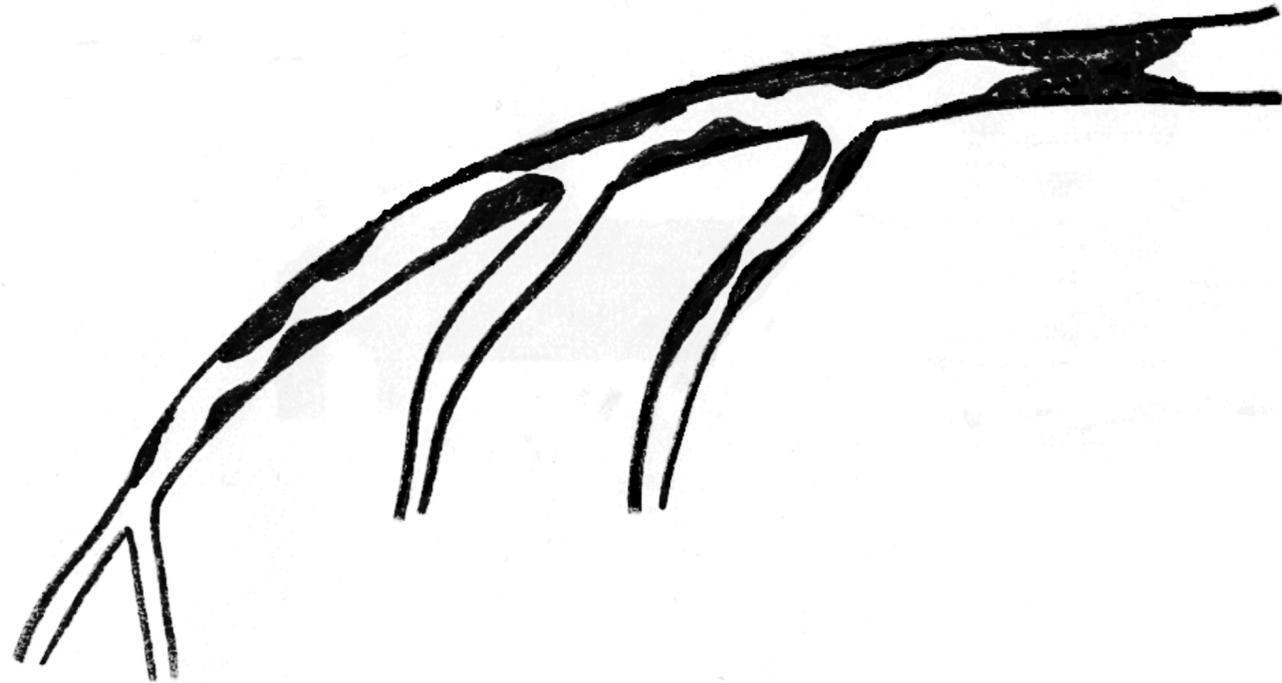
- Cons:
 - Indirect vision
 - Microscope takes a lot of space
 - Need of consumables



Diffuse lesions

Ways to operate

- Distal anastomosis
- Endarterectomy
- Prolonged anastomosis
- On-lay patch



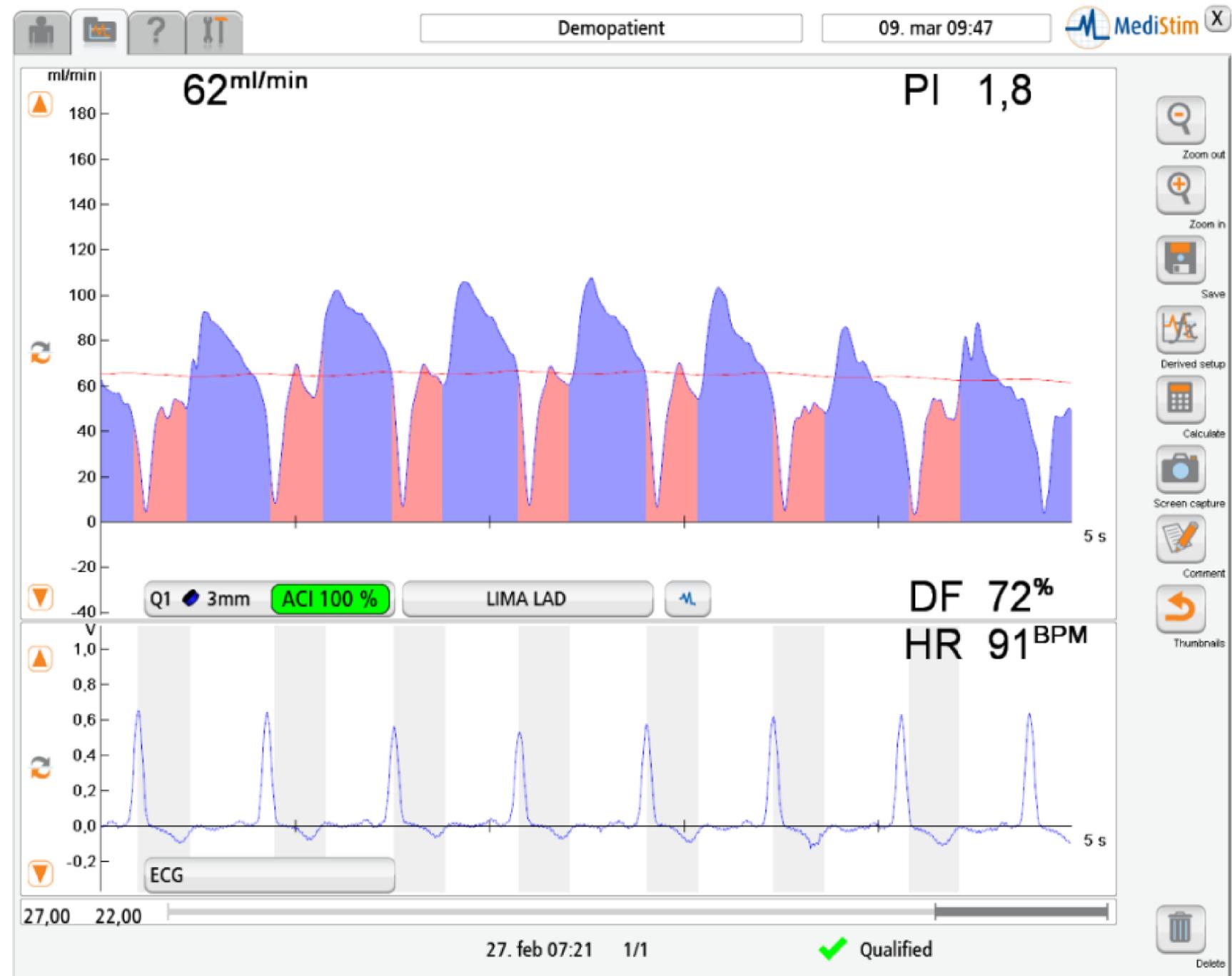
Materials

- 142 patients over 18 years old, underwent to CABG with evaluation of TTF parameters from 01.2018 till 12.2021
- Inclusion – all coronary bypasses
- Exclusion – Y-grafts or sequential anastomosis
- 313 (100%) of included grafts undergone TTF:
 - 100 (31,9%) – coronary artery $D \geq 1,5$ mm (Group 1)
 - 137 (43,8%) – coronary artery $D = 1,0$ mm ~ 1,5 mm (Group 2)
 - 76 (24,3%) – coronary artery $D < 1,0$ mm (Group 3)
 - Summary almost 70% – small arteries ($< 1,5$ mm).

TTF

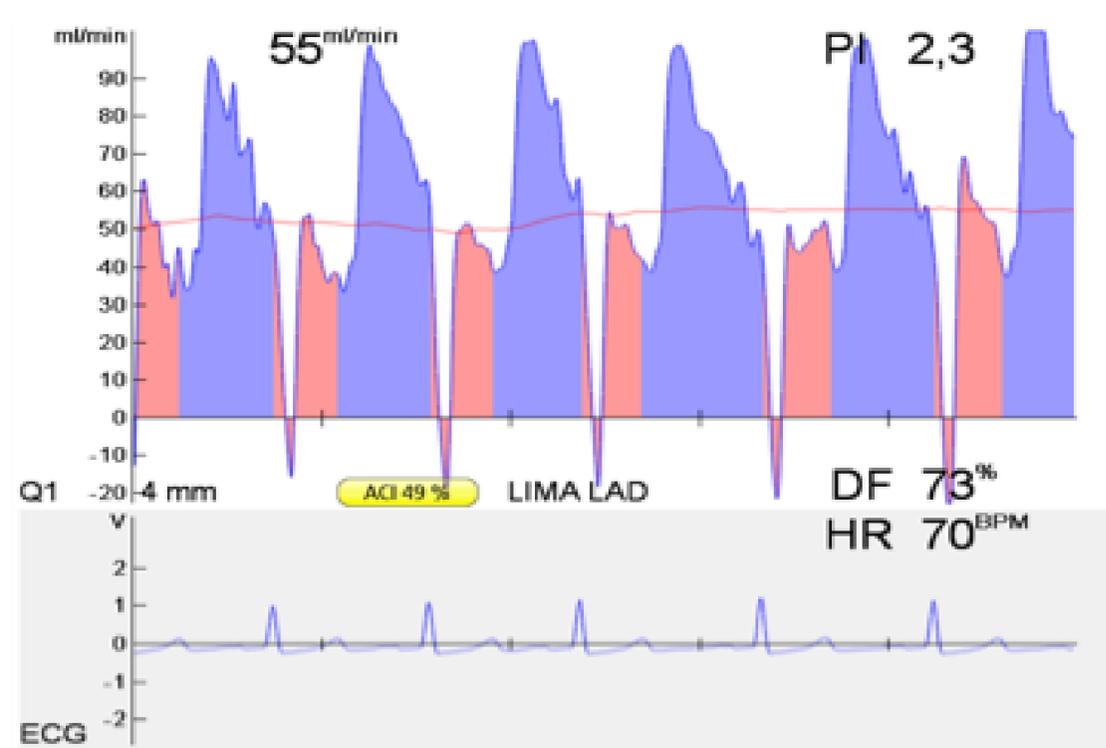
Transit Time Flowmetry

- MGF – Mean Graft Flow
 - Through IMA > 15 ml/min
 - Through venous graft or other arterial graft > 20 ml/min
- PI – Pulsatility Index $< 5,0$
- DF – Diastolic Filling
 - For RCA > 50 %
 - For LCA > 70 %

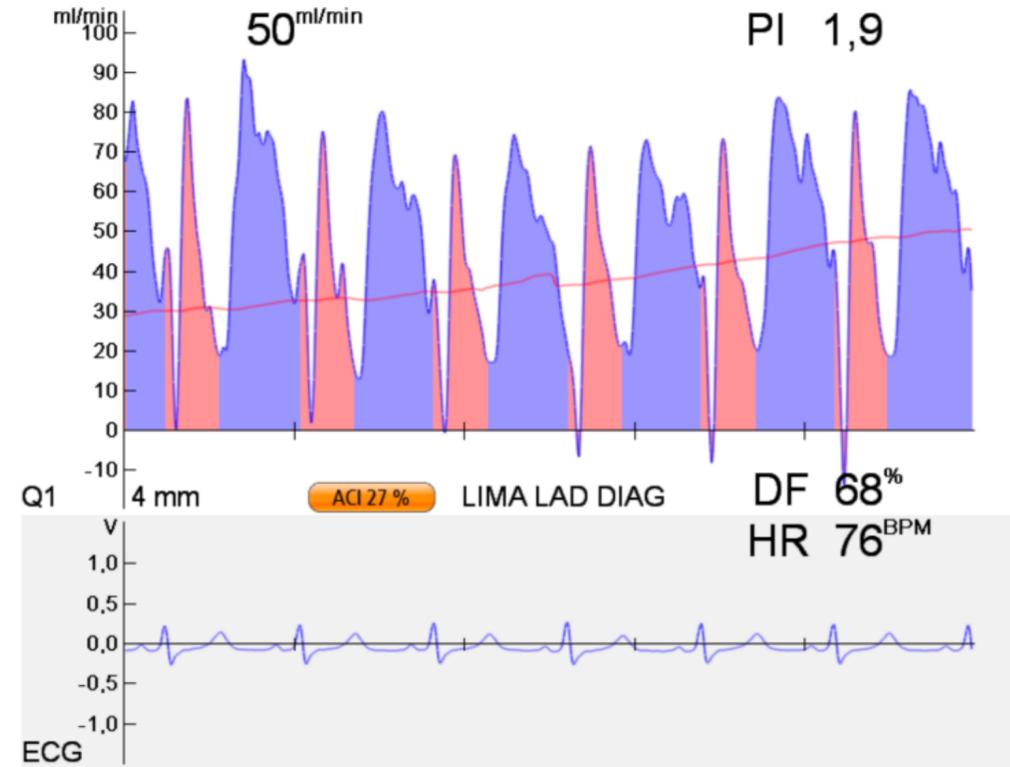


MGF Patterns on TTF

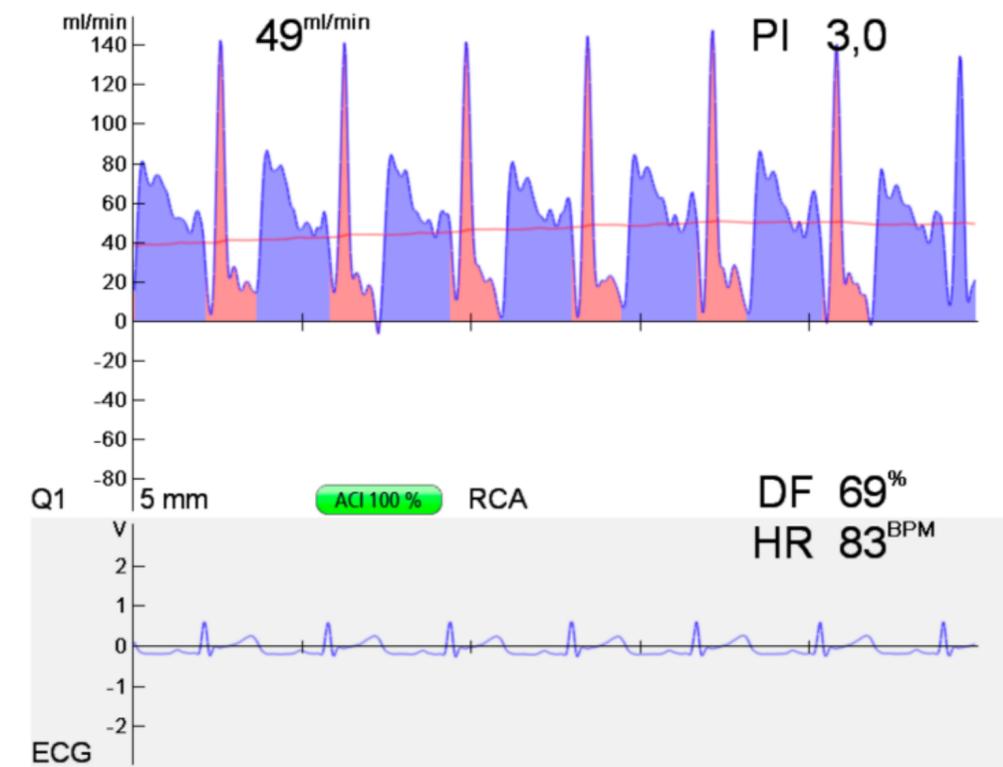
GF on TTF has two main peaks: systolic (SP) and diastolic (DP)



Pattern 1
SP Height < DP Height



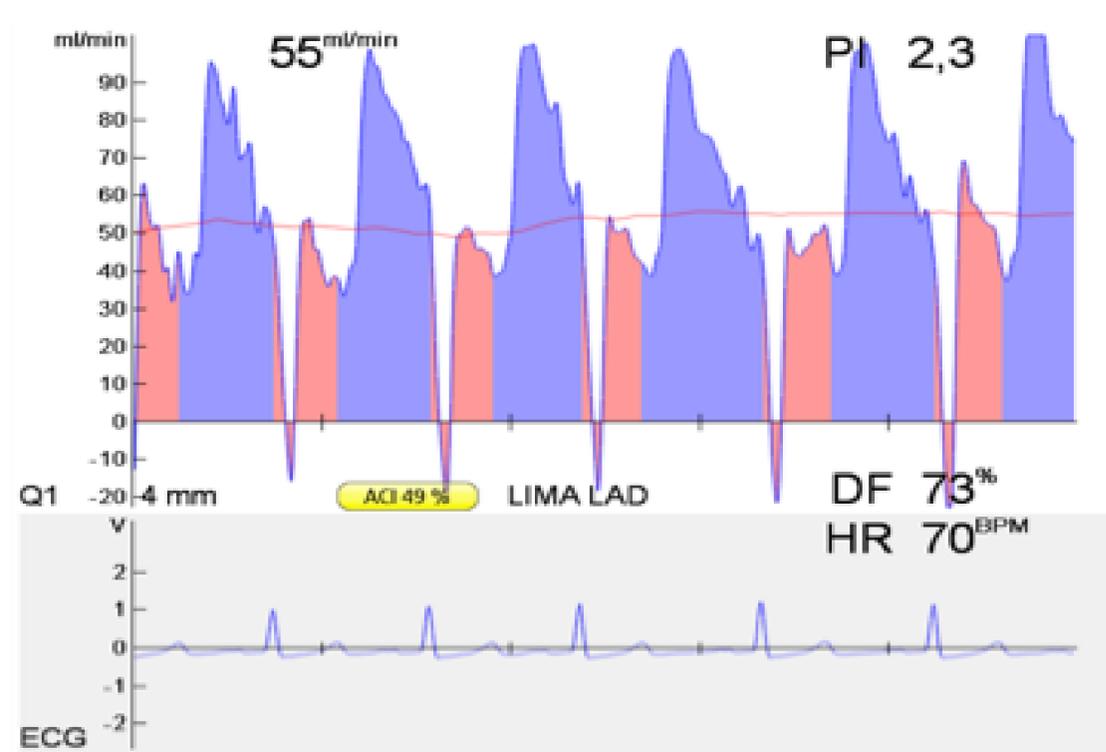
Pattern 2
SP Height = DP Height



Pattern 3
SP Height > DP Height

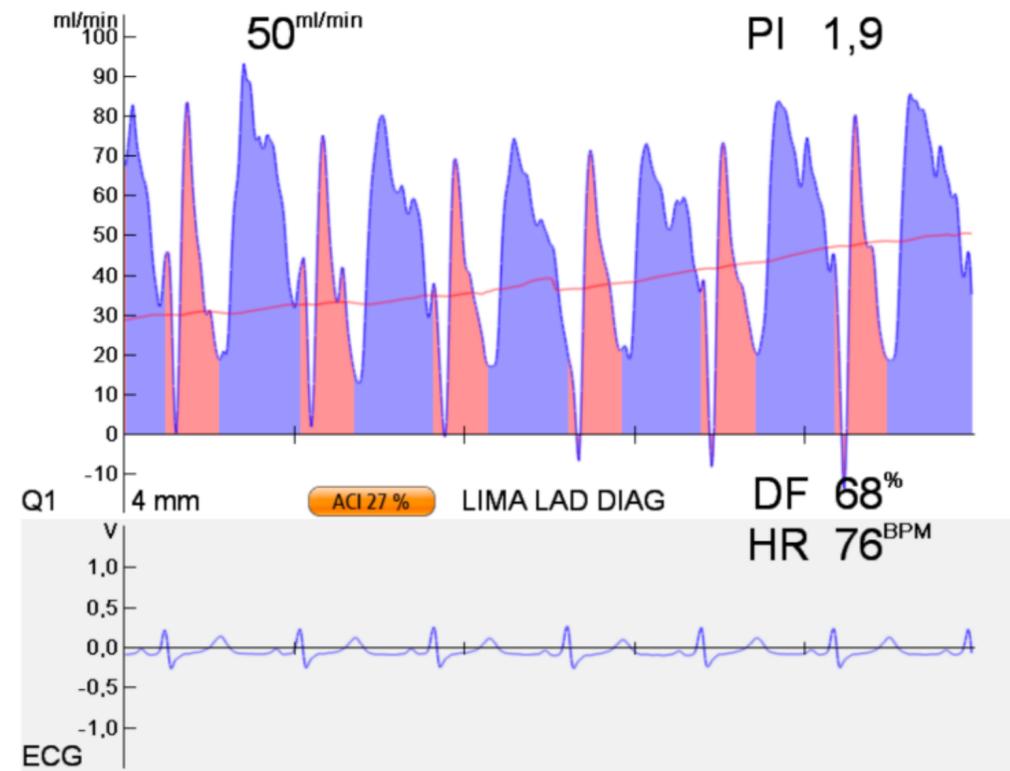
MGF Patterns on TTF

Very strong correlation with Spearman's rho and Kendall's Tau-B coefficients
(S's $p < 0,005$, K's $p < 0,005$)



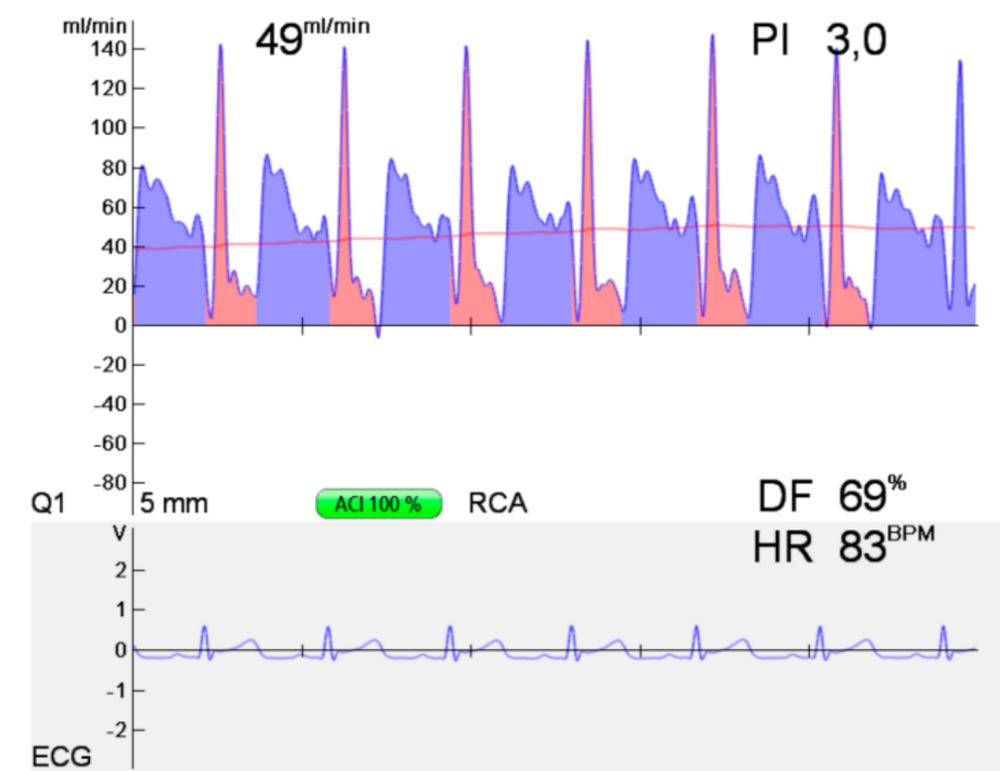
Pattern 1
SP Height < DP Height

(90 % of grafts from Group 1)
Coronary artery $D \geq 1,5$ mm



Pattern 2
SP Height = DP Height

(87 % of grafts from Group 2)
Coronary artery $D = 1,0 \sim 1,5$ mm

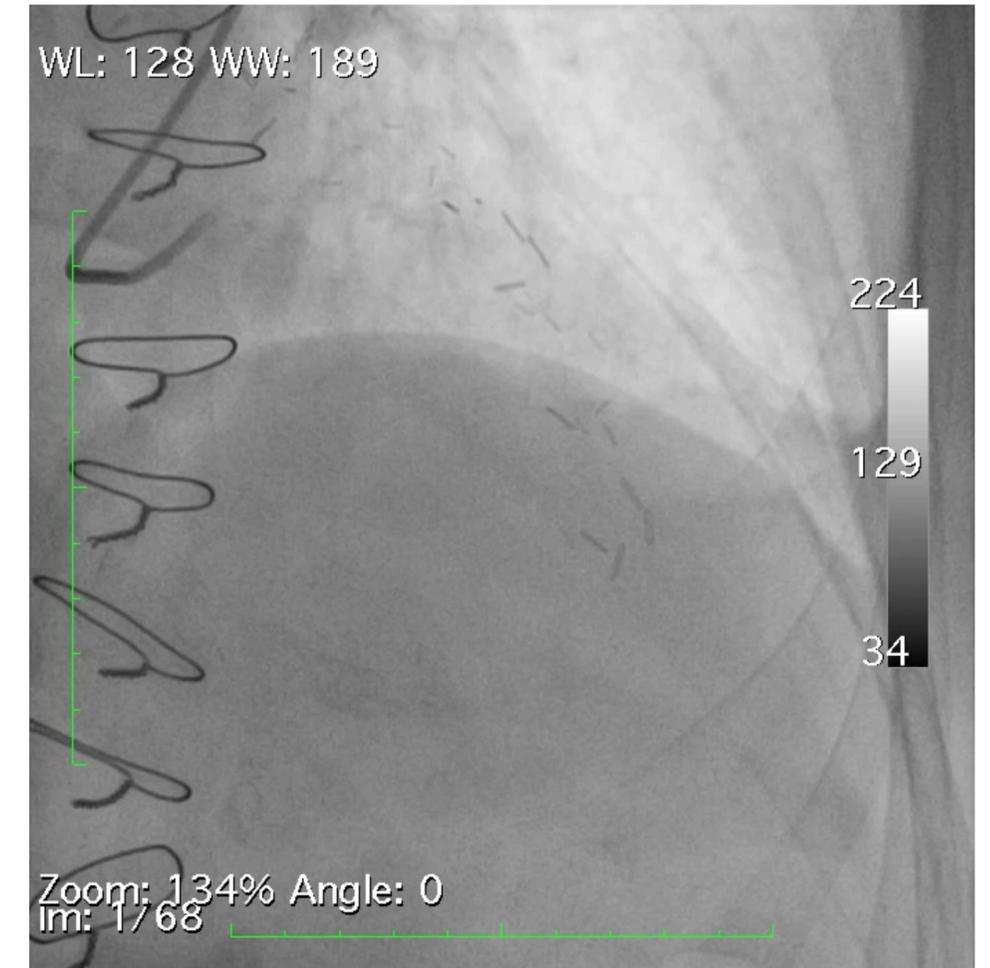
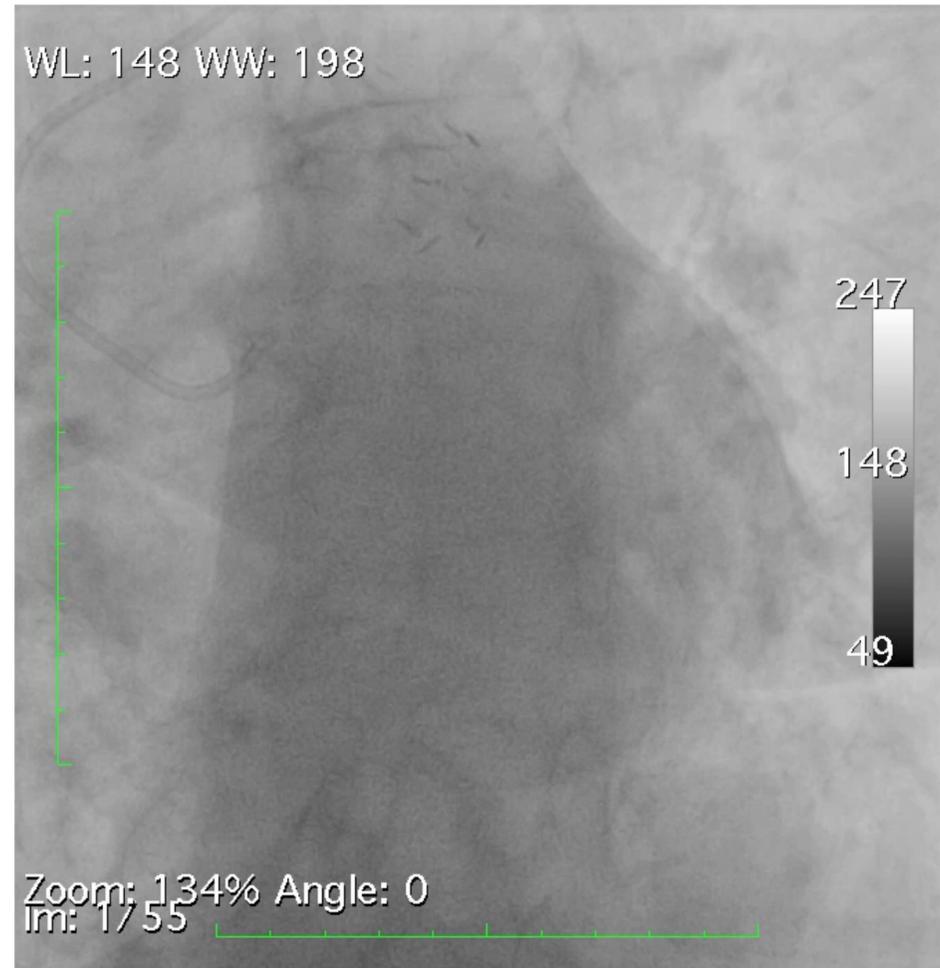
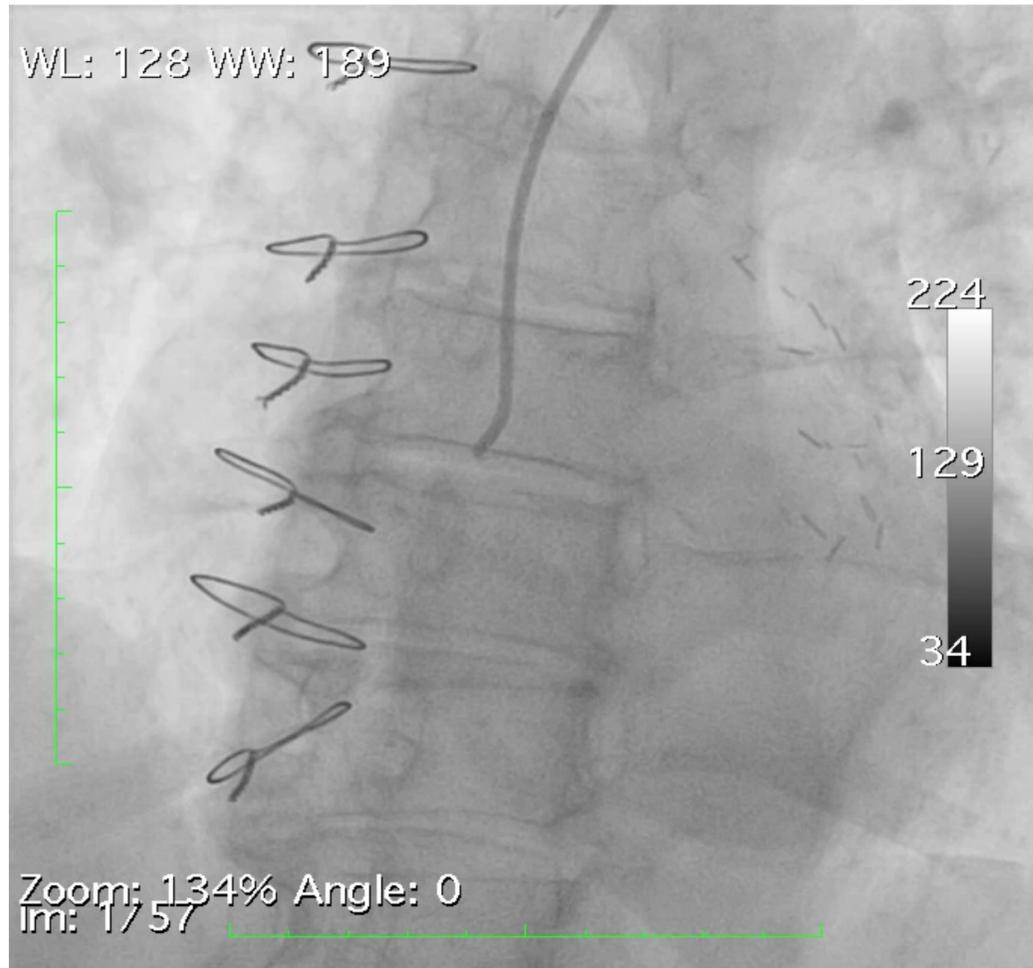


Pattern 3
SP Height > DP Height

(96 % of grafts from Group 1)
Coronary artery $D < 1,5$ mm

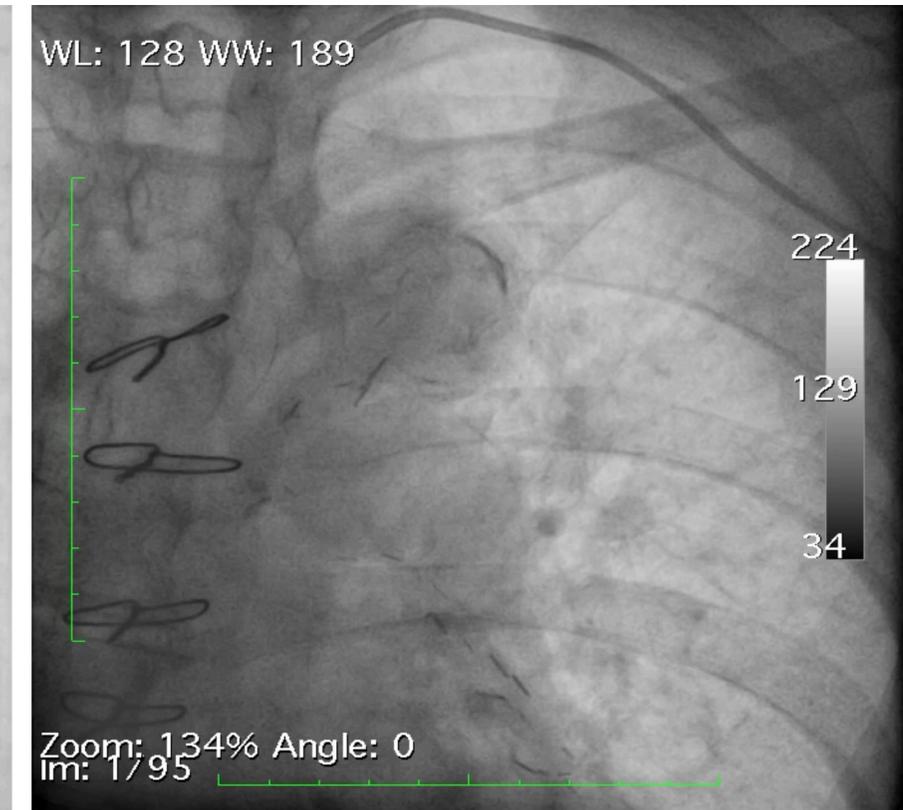
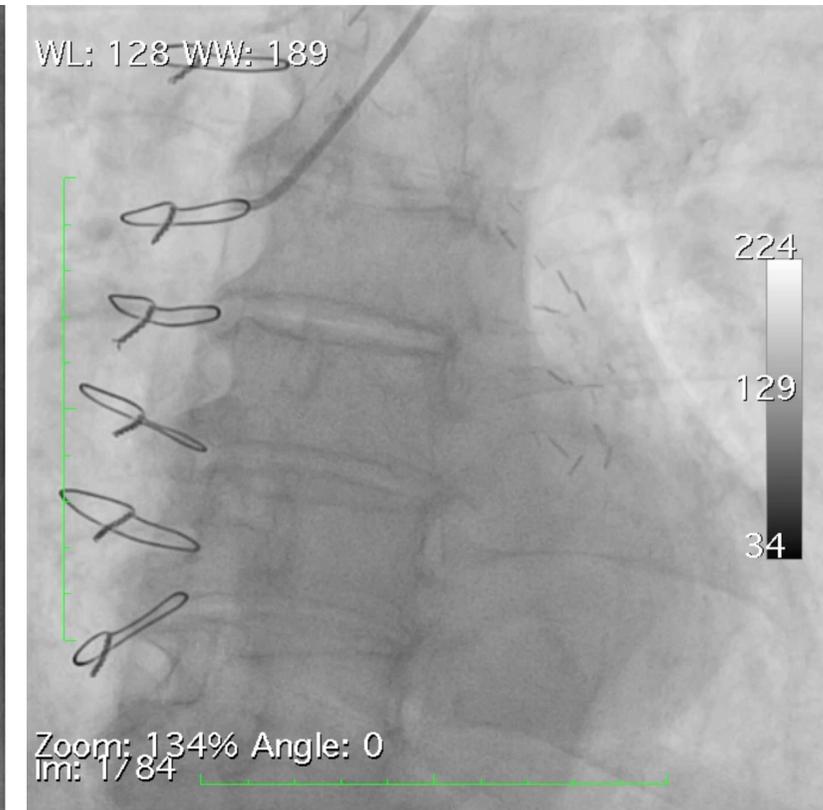
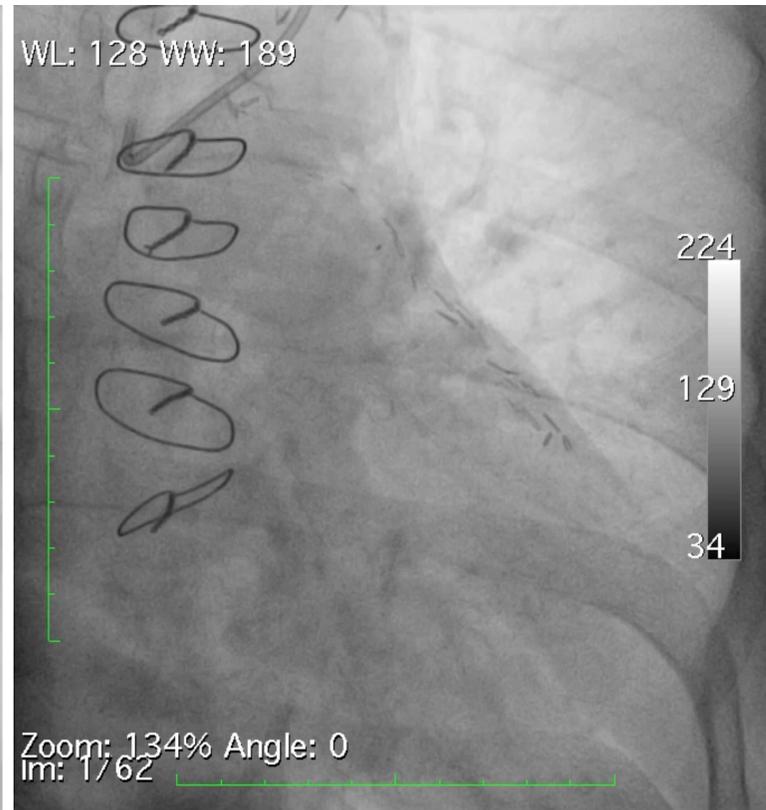
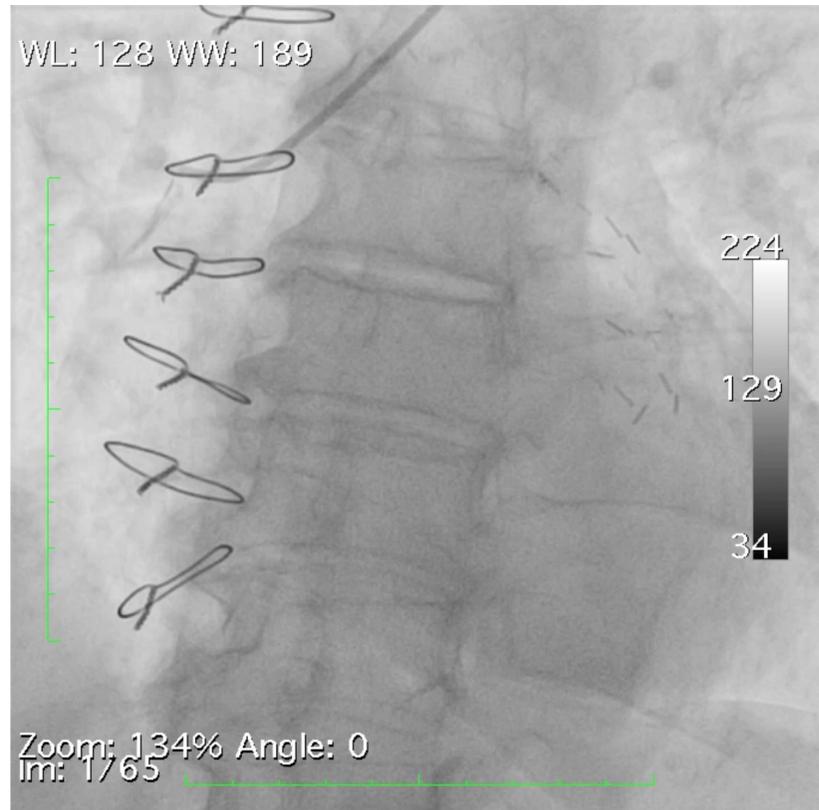
M, 75. CABG in 2003

Native coronary arteries



M, 75. CABG in 2003

Coronaro-angiography in 2017.
All grafts work perfectly



Conclusion

Grafts to small arteries show good TTF parameters

MGF for grafts to small arteries is less than to arteries with $d \geq 1,5$ mm but still classifies as satisfactory

Diameter of artery correlates with MGF pattern on TTF and type of pattern may be also a criteria for well-done anastomosis

Conclusion

PI and DF don't really correlate with diameter of coronary artery and predominately shows quality of anastomosis or recurrent flow in it

Satisfactory TTF parameters of grafts even to small coronary arteries predict long well-functioning life of these grafts

Thank you for your attention!

