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Improved Regional Wall Motion 6 Months After Direct Myocardial Revascularization (DMR) With the NOGA DMR System

Glenn Van Langenhove, MD; Jaap N. Hamburger, MD; Peter C. Smits, MD; David P. Foley, MD; Mariano Albertal, MD; Patrick W. Serruys, MD

A 60-year-old man was referred to our intervention laboratory for direct myocardial revascularization (DMR). He had received maximal medical therapy and had undergone coronary bypass surgery 10 years earlier, and his peripheral coronary anatomy was now found to be unsuited for surgical revascularization. In addition, the lesions on coronary angiography proved to be unfit for percutaneous revascularization. Consequently, a DMR procedure was performed. We used the NOGA nonfluoroscopic electromechanical mapping system (Biosense-Webster) as a guidance tool to deliver laser energy at the exact target locations. The system has been described previously.^{1,2} In the Figure, A shows the local linear shortening (LLS) map in the left anterior oblique view and its corresponding bull's-eye view (A') at baseline. The map is color-coded (see color bar in B), ranging from red (LLS <2%) to purple (LLS >11%), with red zones thought to delineate akinetic zones and purple normokinetic zones.² The bull's-eye view shows basal (outer circle), mid, and apical (inner circle) regions of (clockwise from top) the anterior (small A), lateral (L), posterior (P), and septal (S) segments. In the picture, the low LLS values in the basal and mid portions of the posterior and lateral segments can be seen (-1.4%, -2.5%, 2.2%, and 4.1%, respectively). Because the unipolar voltage map suggested viability, these regions were

thought to be eligible for DMR. B and B' show the LLS map after the DMR procedures, with the brown tags showing the precise locations of the laser energy applications. Similar LLS values in this region support the belief that regional wall motion improvement can be expected only after a certain time delay and not immediately after DMR.

The control map taken at 6 months is shown in C and C'. The improvement of regional wall motion can easily be appreciated in C. Indeed, the posterolateral zone, formerly colored red, is now green-blue, suggesting increased LLS and thus improved wall motion. The bull's-eye shows increases in LLS of 2.9%, 7.1%, 4.3%, and 7.2% for basal and mid portions of the posterior and lateral segments, respectively (average increase, $4.8 \pm 3.3\%$).

This case suggests, for the first time, a local shortening increase as a function of left ventricular wall motion improvement 6 months after a DMR procedure.

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