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CARRIERA ACCADEMICA: 2004-2006: Professore associato confermato; 2006 (dal 01/06): Professore straordinario; 2009 (dal 01/06): Professore Ordinario.

INSEGNAMENTI. Laurea Magistrale: Cardiologia, Semeiotica medica (Elettrocardiografia); Laurea breve in Fisioterapia: Cardiologia.

CURRICULUM *Laureato in Medicina e Chirurgia nell'Agosto 1972 (lode) all'Università di Bologna, si è specializzato in Malattie dell'Apparato Cardiovascolare presso l'Università di Padova nel Luglio 1975. Fellow di ricerca presso il Brompton Hospital (Londra) nel periodo 1975/1976 e presso la Johns Hopkins University (Baltimora) nel periodo 1985/1987, è stato assistente ed aiuto ospedaliero dal 1976 al Novembre 1999 presso la Divisione di Cardiologia dell'Ospedale Maggiore dell'Azienda Ospedaliera di Verona. Professore Associato di Cardiologia dell'Università di Verona dal Novembre 1999 al Dicembre 2004, è stato, nello stesso periodo Responsabile del Servizio di Cardiologia dell'Ospedale Policlinico dell'Azienda Ospedaliera di Verona. Professore Ordinario di Cardiologia all'Università del Piemonte Orientale "A. Avogadro", è Direttore della Cattedra, della Cardiologia Clinica e del Dipartimento Cardiovascolare dell'Azienda Ospedaliero-Universitaria "Maggiore della Carità" di Novara dal Dicembre 2004. Il principale argomento di ricerca sviluppato in questi anni è stato il fenomeno del rimodellamento ventricolare postinfartuale e lo studio della funzione diastolica. E' stato Consigliere della Società Italiana di Cardiologia (1999-2002, 2007-2009), Chairman del Working Group on Myocardial Function della Società Europea di Cardiologia (2001-2002) e Coordinatore del Gruppo di Ecocardiografia della Società Italiana di Cardiologia (2003-2005). Dal Gennaio 2009 a tutt'oggi ricopre il ruolo di Presidente della Società Italiana di Cardiologia.*

CAMPI DI INDAGINE NELLA RICERCA. Meccanismi della disfunzione ventricolare sisto-diastolica; fisiopatologia della disfunzione adiacente all'area ischemica; meccanica ventricolare nell'ischemia acuta e cronica; rimodellamento ventricolare postinfartuale e teoria del vaso pervio; doppler-ematica, con particolare riferimento a: funzione atriale e riempimento ventricolare sinistro .

TEMI CORRENTI DI RICERCA.

Myocardial contrast echocardiography after myocardial infarction: relation between residual myocardial perfusion, contractile reserve and long term remodeling. Background: Previous studies have shown the potential role played by intracoronary myocardial contrast echocardiography (MCE) in predicting long-term remodeling and function after myocardial infarction (MI). Scanty data, however, are available on the role of intravenous MCE in this regard.

Purpose of the study: to assess the role of residual myocardial blood volume (MBV) in the asynergic region in modulating ventricular volume changes over time post-MI.

Methods: 32 consecutive patients with an anterior MI were studied using low-dose (10-15 µgr/kg/min) dobutamine echo (Dob) and intravenous triggered MCE (Levovist infusion 400 mg/ml over 2') >6 days after the acute event. In all patients the left anterior descending artery was identified as the infarct-related vessel (residual stenosis after stenting 39±33%). Videointensity plots were generated from the apical approach using a 12 segment model, with the results fitted to an exponential function. Quantitative estimation of the positive and plateauing value of the curve was then assessed for each ventricular segment, assuming that higher peak intensity reflects greater MBV, and averaged for the asynergic region. Ventricular volumes were assessed according to a biplane Simpson's method at baseline, during Dob and after 254±190 days.

Results: Baseline volumes appeared to be directly related to the extent of the asynergic region (p<.01) but showed no relation with the normalized videointensity (NVI) in that area. Overall diastolic ventricular volumes did not change at follow-up (from 69±16 to 69±20 ml/sqm, NS), although wall

motion score index (WMSI from 1.7±0.3 to 1.6±0.3, p=.001), ejection fraction (EF from 45±9 to 52±8 %, p=.004) and the ratio of end-systolic pressure/volume (ESP/V) (from 3.4±1.4 to 4.7±2.1 mmHg/ml/sqm, p<.001) significantly improved with Dob. Videointensity in the asynergic region, normalized to the remote myocardium (NVI), however, exhibited a significant interaction with the change in diastolic volume between baseline and follow-up (p=.044), with patients with the highest NVI exhibiting reverse remodeling (n=11, from 69±16 to 65±16 ml/sqm) over time as compared with the remaining population (n=21, from 68±16 to 73±21 ml/sqm). This was not true when parameters derived from Dob (change in WMSI, EF and ESP/V) were used. A multivariate analysis, including variables known to affect post-MI ventricular dilation ranked NVI second (p=.066), after baseline stroke volume (p=.005), in predicting changes in diastolic volumes over time.

Conclusions: Unlike predischARGE inotropic stimulation, residual MBV in the dysfunctioning muscle, as assessed quantitatively by intravenous MCE early after the acute event, has the potential to modulate chronic ventricular remodeling in patients who suffered an anterior MI.

Cardiac Dyssynchrony Quantitated by Time-to-Peak or Temporal Uniformity of Strain at Longitudinal, Circumferential, and Radial Level: Implications for Resynchronization Therapy. Background: The standard deviation of time to peak strain (TPS-SD) has been proposed as an index of left ventricular (LV) dyssynchrony in patients to be resynchronized. However, TPS-SD is sensitive to noise, and the influence of outliers on TPS-SD is also relevant. Alternatively, dyssynchrony can be indexed by temporal uniformity of strain (TUS), whereby a time plot of regional strains, arranged for LV location, is subjected to Fourier analysis. If segments shorten simultaneously (synchronously), the plot appears as a straight line, with power only in the zero-order Fourier term, whereas regionally clustered dyssynchrony generates an undulating plot with higher power in the first-order term. TUS index reflects zero-order relative to first-order plus zero-order power.

Methods: In this study, TUS and TPS-SD were computed in 68 patients (QRS duration \leq 120 ms; ejection fraction \geq 0.35) in whom longitudinal, circumferential, and radial strains were measured using speckletracking two-dimensional echocardiography before and 3 to 6 months after cardiac resynchronization therapy (CRT), together with LV volumes.

Results: Following CRT, LV volume decreased (diastolic, -10.6±2.0%) and ejection fraction improved from 0.23 ± 0.07 to 0.30 ± 0.10 (P < .001 for both). Circumferential strain was ameliorated as well (P = .054). Twoway analysis of variance revealed TUS improvement after CRT (P = .043), with a trend for CRT to contrast asynchrony at the circumferential (+0.06 ± 0.25) and longitudinal (+0.05 ± 0.18) levels compared with the radial level (-0.002 ± 0.18) (interaction P = .06). This was not true for TPS-SD. Multivariate analysis revealed that only TUS, assessed before CRT circumferentially, predicted ejection fraction improvement after CRT. Other asynchrony variables failed in the model.

Conclusion: Dyssynchrony indexed by circumferential TUS yields greater CRT benefits than that indexed by TPS-SD, supporting the idea of targeting TUS-measured dyssynchrony as a more informative quantitative measurement in CRT patients.

PUBBLICAZIONI PIÙ RECENTI.

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2: Bertola B, Rondano E, Sulis M, Sarasso G, Piccinino C, Marti G, Devecchi P, Magnani A, Francalacci G, Marino PN. Cardiac Dyssynchrony Quantitated by Time-to-Peak or Temporal Uniformity of Strain at Longitudinal, Circumferential and Radial Level: Implications for Resynchronization Therapy. *J Am Soc Echocardiogr*. 2009 May 5. [Epub ahead of print] PubMed PMID: 19423288.

3: De Luca G, Ucci G, Cassetti E, Marino P. Benefits from small molecule administration as compared with abciximab among patients with ST-segment elevation myocardial infarction treated with primary angioplasty: a meta-analysis. *J Am Coll Cardiol*. 2009 May 5;53(18):1668-73. PubMed PMID: 19406342.

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6: Nagueh SF, Appleton CP, Gillebert TC, Marino PN, Oh JK, Smiseth OA, Waggoner AD, Flachskampf FA, Pellikka PA, Evangelisa A. Recommendations for the valuation of left ventricular

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- 18: Nistri S, Galderisi M, Faggiano P, Antonini-Canterin F, Ansalone G, Dini FL, Di Salvo G, Gallina S, Mele D, Montisci R, Sciomer S, Di Bello V, Mondillo S, Marino PN; Working Group on Echocardiography of the Italian Society of Cardiology. Practical echocardiography in aortic valve stenosis. *J Cardiovasc Med (Hagerstown)*. 2008 Jul;9(7):653-65. Review. PubMed PMID: 18545063.
- 19: De Luca G, Cassetti E, Marino P. Impact of duration of clopidogrel prescription on outcome of DES as compared to BMS in primary angioplasty: a meta-regression analysis of randomized trials. *J Thromb Thrombolysis*. 2009 May;27(4):365-78. Epub 2008 May 23. PubMed PMID: 18498003.
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with thrombolysis. A meta-analysis of the randomized trials. *Am Heart J.* 2007 Dec;154(6):1085.e1-6. Epub 2007 Oct 26. PubMed PMID: 18035079.

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Capitoli di libro:

Macciò S, Marino P. Role of the left atrium. *Diastolic Heart Failure*, a cura di Smiseth OA e Tendera M. Springer-Verlag editore, 2008, pag 53-70.

Orario di Ricevimento

(Mercoledì 12.30-13.00- Clinica Cardiologica –
previo appuntamento telefonico (0321-3733597))