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## **Pacing and Defibrillation Lead Exchange without Vein Puncture.**

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**Background:** During lead implantation venous access is generally achieved by puncturing the Subclavian or Axillary Vein. Sometimes, although rarely, after lead positioning, the lead must be changed because of its inadequate mechanical stability or poor pacing parameters.

This report concerns a technique of lead exchange that avoids an additional vein puncture.

**Method:** The tip of the lead, that has to be replaced, is retracted from the right atrium or ventricle into the Superior Vena Cava; the lead insulation is lanced along a few millimeters; the straight flexible tip of the guide wire is inserted between the insulation layer and the conductor of the lead. Then the lead is advanced, while the guide wire is driven in, until the tip of the guide wire is in the Superior Vena Cava. At this point the tip of the guide wire, gently retracted from its position, is released in the vein lumen. Subsequently the lead is completely extracted from the vein but the guide wire is maintained inside it. A dilator with a mounted peel-away sheath is advanced over the guide wire. The lead positioning follows in the usual manner.

**Results:** Three (2.2%) of the 139 implanted defibrillator leads and 13 (3.3%) of the 391 pacing leads were replaced. All the procedures were successful; their mean time was  $2 \pm 1$  minutes.

**Conclusion:** This technique is successful and safe in providing vein access using the previously implanted lead, thus avoiding the need to repeat the puncturing of a vein.

## **EPS For Syncope Evaluation: The Rate of Adherence to the Guidelines and the Implications On the Clinical Outcome**

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**Background:** Syncope is a frequent clinical problem and presents major challenge in the field of diagnosis and treatment. Electrophysiology study (EPS) is one of the diagnostic tools to determine the etiology of syncope. The importance of this test in elucidating the reason for unexplained syncope is still not fully determined.

**Objective:** To evaluate the effect of Electrophysiology Study, as recommended by The European Society of Cardiology, on the morbidity and mortality of patients with unexplained syncope.

**Methods:** The outcome of patients with unexplained syncope who had an EPS was compared with the outcome of patients with unexplained syncope and without EPS. In patients, admitted to the Hadassah University Hospital between 2001-2006, the recurrence of syncope, pacemaker and defibrillator implantation were evaluated.

**Results:** In among 2954 patients admitted with syncope between 2001 and 2006, 681 had unexplained syncope. From among these patients in 91 (13.3%), although qualified for EPS according the ESC guidelines, the test was not performed and were compared with 52 patients who had EPS following the syncope. In patients with EPS more pacemaker were implanted (36% vs. 8.8%,  $p<0.001$ ) and more ICD were implanted (21.2% vs. 1.1%,  $p<0.001$ ). There was no difference in the recurrence of syncope between the two groups (17.3% vs. 15.4%,  $p=0.8149$ ). The mortality was similar in the two groups (22.0% vs. 15.4%,  $p=0.2671$ ). The main differences between the two groups were: all the patients with non-sustained ventricular tachycardia in Holter were referred to EPS and there was tendency not to refer patients with small Q waves on ECG to EPS (3.8% vs. 45.1%,  $p<0.001$ ).

**Conclusions:** In Hadassah University Hospital, the referral of patients with unexplained syncope to EPS was individualized with partial adherence to ESC guidelines. Patients with EPS had more pacemakers and ICD implanted without significant difference in the recurrence of syncope and mortality. This apparent discrepancy may suggest that patients referred to EPS were considered to be on a higher risk and EPS guided therapy provides adequate protection. Incidental Q waves on ECG may not predict presence of structural heart disease and increased risk.

## **Predictors and Treatment Response with Cardiac Resynchronization Therapy in Patients with Heart Failure: Long Term Follow Up**

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**Background:** Cardiac resynchronization therapy (CRT) is an established treatment for patients with advanced heart failure. Nevertheless, about 20-30% of patients in randomized trials do not respond clinically, part of that most probably due to incorrect patient selection.

**Objectives:** 1) To estimate the effectiveness and safety of CRT in our routine practice, outside of clinical trials. 2) To find predictors of favorable response to CRT.

**Methods:** Retrospective analysis of all patients underwent CRT in our hospital from February 2003 until December 2007. Clinical and echocardiographic parameters were assessed before and after CRT implantation. Patients that improved in one class and two classes of New York heart association (NYHA) were defined as responders and highly responders respectively.

**Results:** During the study period, 56 consecutive patients (73.2% men, age  $66.3 \pm 10.2$  years) with left heart failure (LHF) (ischemic cardiomyopathy 60.7%) received CRT and were followed for a mean of 27 months. After the implantation the mean functional capacity improved from NYHA class 3 to class 2. Mean number of hospital admissions due to LHF exacerbation at one year follow up reduced by 79% (1.9 versus 0.4). Echocardiographic parameters as mean ejection fraction (EF) improved by 31% (19.5% versus 25.6%) and mean diastolic dysfunction improved by one class (from moderately- severely reduced to mildly – moderately reduced). Complication rate was 7.1% at the implantation and 16.1% at the follow up. Twenty one patients (37.5%) died during the follow up, on average 13.6 months after the implantation. According to their clinical improvement, eleven patients were non responders, fifteen patients were responders and nine patients were highly responders. Responders and highly responders had higher number of hospitalizations due to LHF prior to implantation ( $p=0.02$ ). After the implantation highly responders had less events of acute LHF decompensation, better diastolic function, better ejection fraction, milder mitral regurgitation (MR) and no cardiac death, compare to non responders and responders. Factors predictive of highly responders to CRT were treatment with angiotensin receptor blocker ( $p=0.007$ ) and positive inotropic therapy prior to implantation ( $p=0.06$ ). Significant improvement in severity of MR was an important predictor of high responsiveness ( $p=0.004$ ).

**Conclusions:** CRT is an effective therapy in long term follow up of symptomatic patients with LHF in real world practice. Patients with more events of acute LHF decompensation and positive inotropic therapy will more benefit from CRT. One of the main factors that predict clinical improvement is significant reduction in MR. Understanding the mechanism of MR in each LHF patient and the role of mechanical dyssynchrony as a pathophysiological determinant of MR will allow better selection of patients for CRT.