Cite this as: Kang CHEN, Ye MAO, Shao-hua LIU, Qiong WU, Qing-zhi LUO, Wen-qi PAN, Qi JIN, Ning ZHANG, Tian-you LING, Ying CHEN, Gang GU, Wei-feng SHEN, Li-qun WU, 2014. Is right ventricular mid-septal pacing superior to apical pacing in patients with high degree atrio-ventricular block and moderately depressed left ventricular function? *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology),* **15**(6):507-514. [**doi:**10.1631/jzus.B1400034]

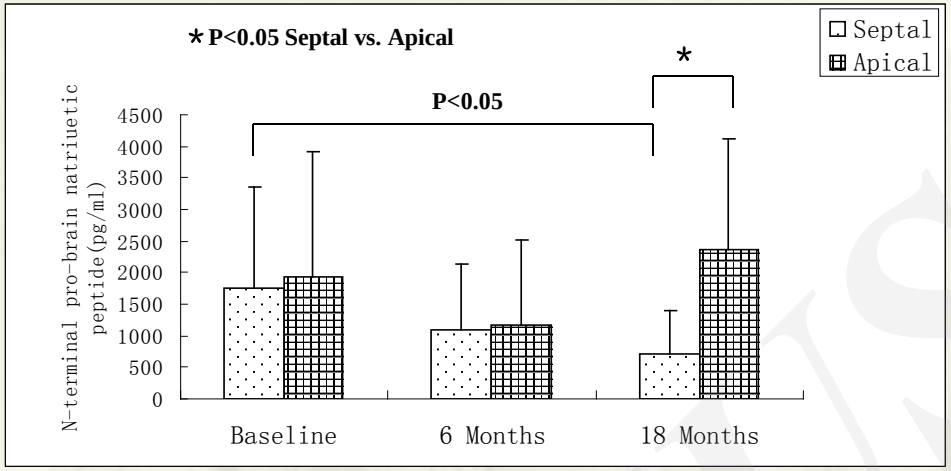
Is right ventricular mid-septal pacing superior to apical pacing in patients with high degree atrio-ventricular block and moderately depressed left ventricular function?

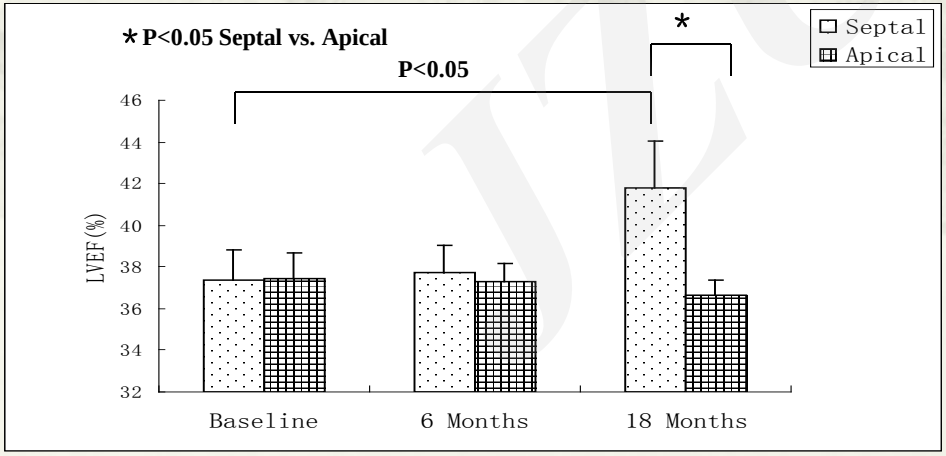
Key words: Mid-septal pacing, apical pacing, impaired heart function

Summary

- **Background:** We investigated whether right ventricular mid-septal pacing (RVMSP) is superior to conventional right ventricular apical pacing (RVAP) in improving clinical functional capacity and left ventricular ejection fraction (LVEF) for patients with high-degree atrio-ventricular block and moderately depressed LV function.
- **Methods:** Ninety-two patients with high-degree atrio-ventricular block and moderately reduced LVEF (ranging from 35 to 50%) were randomly allocated to RVMSP (n=45) and RVAP (n=47). New York Heart Association (NYHA) functional class, echocardiographic LVEF, and distance during a 6-min walk test (6MWT) were determined at 18 months after pacemaker implantation.
- **Results:** Compared with baseline, NYHA functional class remained unchanged at 18 months, 6MWT (485m vs 517m) and LVEF (36.7% vs 41.8%) were increased, but BNP levels were reduced (2872 pg/ml vs 800 pg/ml) in the RVMSP group compared with those in the RVAP group, especially in patients with LVEF 35-40% (for all comparisons, $P<0.05$). However, clinical function capacity and LV function measurements were not significantly changed in patients with RVAP, despite the pacing measurements being similar in both groups, such as R-wave amplitude and capture threshold.
- **Conclusions:** RVMSP provides better clinical utility, compared with RVAP, in patients with high-degree AV-block and moderately depressed LV function whose LVEF levels ranged from 35 to 40%.

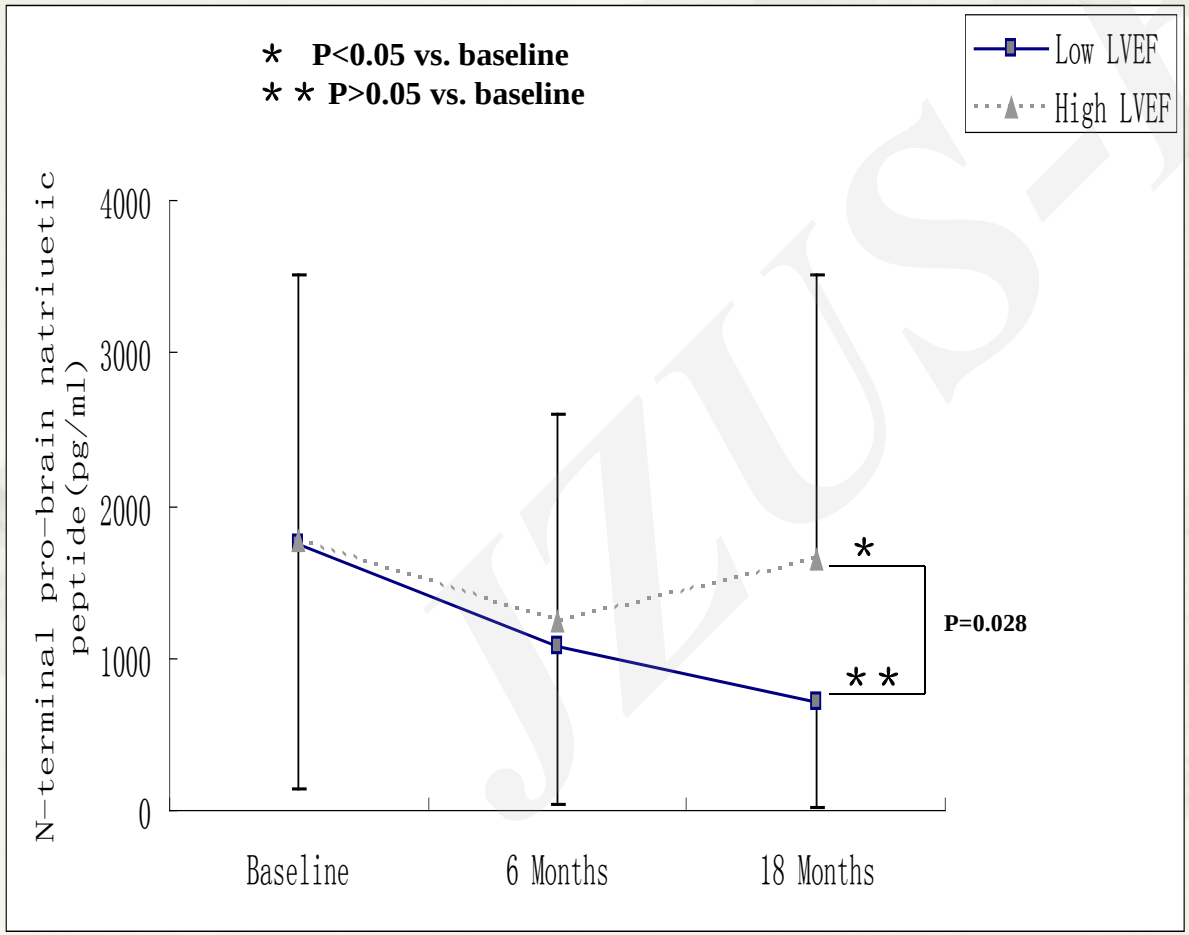
Patients with poor LV function (LVEF 35-40%) had better clinical results after RVMSP compared with those with RVAP





- Patients randomized to the RVMSP group with 35%＜LVEF≤40% at baseline have an obvious BNP which is decreasing during follow-up compared with those in the RVAP group (P<0.05).
- After 18 months' follow-up, patients with 35%＜LVEF≤40% at baseline allocated to RVMSP have a significant increase compared with RVAP (P＜0.05).

Even in the same septal-pacing condition, the lower LVEF group (LVEF 35-40%) had lower serum BNP levels compared with the high LV function group (LVEF 40-50%)



➢**Different levels of LVEF appear to be a key factor for the therapy of mid-septal pacing. The lower LVEF (35%＜LVEF≤40%) group has a better BNP-decreasing effect than the higher LVEF (40%＜LVEF≤50%) group based on the same mid-septal pacing conditions (P＜0.05).**