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Sinus node dysfunction after thoracoscopic surgical ablation for atrial fibrillation

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Background: Sinus node dysfunction (SND) may be a complication of thoracoscopic surgical atrial fibrillation (AF) ablation. Identifying patients at risk is important, since SND may require temporary or permanent pacing therapy. Currently, the incidence and risk factors of SND after thoracoscopic surgery remain unclear.

Purpose: To determine the incidence and risk factors of SND postoperatively in patients undergoing thoracoscopic surgical AF ablation.

Methods: Patients from the Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery (AFACT) study underwent pulmonary vein isolation plus additional left atrial lesion, roof and trigone line, when indicated. Patients were randomised to ganglion plexus (GP) ablation or no GP ablation. SND was defined as: symptomatic or asymptomatic junctional rhythm exceeding sinus rate within 30 days postoperatively. The risk of SND was assessed by multivariable logistic regression modelling. The odds ratios (OR) with corresponding 95% confidence intervals (95% CI) were calculated. Temporary and permanent pacemaker (PM) implantation rate was determined.

Results: The AFACT study included 240 patients with advanced AF, mean age: 61.5±7.8 in SND patients vs 58.7±8.2 years in patients without SND, p=0.18. Seventeen (7.1%) patients developed SND; in 15 patients this was symptomatic. SND patients more often had persistent AF, than patients without SND (88.2% vs. 57.4%, respectively, p=0.01). The rate of GP ablation was 11 (64.7%) patients with SND, similar to 107 (48.0%) patients without SND, p=0.18. Mean admission duration was 7.5±3.0 days in patients with SND, while it was 5.0±1.8 days in patients without SND, p=0.003. After multivariable testing, AF duration =5 years decreased the SND risk (OR: 0.28, 95% CI: 0.08-0.86, p=0.02), while additional left atrial lesions increased the risk (OR: 12.2, 95% CI: 2.39-223.1, p=0.04) (Figure). During admission, six (35.3%) patients warranted temporary pacing for one to seven days. Permanent PMs were implanted in five (29.4%) patients.

Conclusion: Symptomatic SND after thoracoscopic surgical AF ablation occurs regularly. Additional left atrial lesions strongly increase the risk of SND. The majority of SND was temporary and resolved to sinus rhythm within days, hence a restrictive approach towards PM implantation is indicated in this setting.
Abstract:

Sinus node dysfunction (SND) after thoracoscopic surgical ablation for atrial fibrillation (AF) is a possible complication. Identifying patients at risk is important, as SND may require temporary or permanent pacemaker therapy. The incidence and risk factors of SND after thoracoscopic AF ablation are unclear.

Purpose: To determine the incidence and risk factors of SND postoperatively in patients undergoing thoracoscopic surgical AF ablation.

Methods: Patients from the Atrial Fibrillation Ablation and Autonomic Modulation via Thoracoscopic Surgery (AFACT) study underwent pulmonary vein isolation plus additional left atrial lesion, roof and trigone line, when indicated. Patients were randomized to ganglion plexus (GP) ablation or no GP ablation. SND was defined as symptomatic or asymptomatic junctional rhythm exceeding sinus rate within 30 days postoperatively. The risk of SND was assessed by multivariable logistic regression modeling. The odds ratios (OR) with corresponding 95% confidence intervals (95% CI) were calculated. Temporary and permanent pacemaker (PM) implantation rate was determined.

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A. Female 1.13 0.35 3.19 0.82
Age, ≥65 years 2.41 0.87 6.60 0.88
Persistent AF 5.57 1.52 35.90 0.02
AF duration ≥5 years 0.33 0.09 0.90 0.90
LAVI, ≥34 ml/m² 1.34 0.46 3.93 0.66
Previous catheter PVI 0.42 0.16 1.54 0.26
Hypertension 1.36 0.73 2.50 0.19
Antiarrhythmic drugs 1.17 0.39 3.58 0.75
GP ablation 2.02 0.74 6.05 0.18
Additional lesion set 12.10 2.40 229.20 0.02
PQ interval after ablation, ≥200 ms 2.52 0.29 22.00 0.37
PQ interval after surgery, ≥200 ms 0.56 0.33 1.43 0.53
Heart rate after ablation, ≤60 beats/min 1.87 0.54 5.63 0.33
Heart rate after surgery, ≤60 beats/min 1.39 0.35 5.67 0.63

B. Age, ≥65 years 2.43 0.84 6.99 0.10
AF duration, ≥5 years 0.38 0.18 0.86 0.02
Additional lesion set 12.2 2.39 223.1 0.04