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Bachmann's bundle atrial tachycardia: Electrophysiological mapping and qualitative outcomes

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Introduction: Focal atrial tachycardia (AT) is an uncommon but important cause of SVT, often incessant, highly symptomatic and significantly impacting on quality of life. Bachmann's Bundle (BB) has not been previously described as a site of AT.

Methods: We retrospectively identified cases of AT from the database of two tertiary referral centers between 1997 and 2014. We analyzed the electrophysiological characteristics of BB AT, and collected follow up data including symptom scoring by the Canadian Cardiovascular Society Severity of Atrial Fibrillation (CCS-SAF) and SF-8 scores.

Results: BB AT was confirmed by the anatomical position of earliest atrial activation on fluoroscopy or CARTO electro-anatomical map. We identified 5 cases of BB AT from 546 AT cases (0.91%). 4 patients were female and the mean age at presentation was 32.6±7.1 years. No patient had a history of prior cardiac surgery, significant valvular disease or other cardiac arrhythmia. AT was spontaneous and incessant in 2 patients, induced with programmed electrical stimulation (PES) alone in 2 cases and PES with isoprenaline infusion in 1 case. Sustained and mappable AT was evident in all patients with mean cycle length of 402±37 ms. Endocardial activation times (shown as mean±SD) relative to P wave onset demonstrated His A later than P wave onset or on time in all patients (9±10 ms), proximal CS later than P wave onset in all patients (26±14 ms) and distal CS later than P wave onset in all patients (58±11 ms). The earliest endocardial activation at the site of successful ablation was 23±6 milliseconds ahead of P wave onset during tachycardia. The mean number of radiofrequency applications was 10±8. One patient had recurrence requiring a second ablation. Mean CCS-SAF scores; pre and post-ablation showed significant improvement from class 3 to class 0 respectively ($p<0.001$). SF-8 physical component summary scores improved from pre-ablation mean of 27.5±6.6, post-ablation mean 54.9±4.5 ($p<0.01$). SF-8 mental component summary scores improved from a pre-ablation mean of 33.0±11.3 to post-ablation mean 51.4±16.1 ($p=0.09$). At study follow up (min 1 year, max 12 years) all patients were free of arrhythmia without medication.

Discussion: BB is an uncommon site for AT that causes significant morbidity. It can be successful with good long-term rhythm control and objective improvement in symptoms and physical function.

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Esophageal lesions related to atrial fibrillation ablation

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Atrioesophageal fistula (AEF) is a rare but devastating complication of atrial fibrillation (AF) ablation (incidence 0.01 to 0.2%). Asymptomatic thermal esophageal lesions (EDEL) related to AF ablation occur in up to 60% of patients and are considered a precursor for AEF. Due to the rarity of AEF systematic analysis of related factors is impossible and EDEL have been used as a surrogate endpoint evaluating the risk factors for esophageal damage. In our experience EDEL occur in 8.1% of AF ablation cases when using cautious ablation at the posterior wall with a maximum of 25W irrigated radiofrequency (RF) ablation. Current studies indicate a higher incidence of EDEL when using non-insulated thermal esophageal temperature monitoring during RF ablation (32.5% vs. 6.9%, $p<0.01$) compared to not using any temperature monitoring at all. Using insulated thermal esophageal temperature probes produces comparable incidences of EDEL (7.5%) during RF ablations. Using optimized high-irrigation tip catheters or cryo-balloon 2nd generation is related to an incidence of EDEL of 12 to 18%. Out of a total of 2897 patients including 237 with EDEL 0.03% of erythemas and 0.09% of esophageal ulcers proceed to perforation. Systematic algorithm shows to deal with patients with EDEL are being evaluated within the German working group on arrhythmias.

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