1008-10 Electrocardiographic Configuration Criteria Distinguishing "Endocardial" from "Epicardial" Accessory Pathways in the Left Posteroseptal Space

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To assess whether the surface ECG allows distinction of manifest accessory pathways (APs) located at the subendocardial from those at the subepicardial aspect of the left postero-septal (PS) space, 12-lead surface ECGs were compared between 17 pts with an "endocardial" (ENDO) AP and 24 pts with an "epicardial" (EPI) manifest AP. Location of the AP was defined by the site of successful pulse delivery: EPI PS APs were ablated from within the coronary sinus (CS); ENDO PS APs were ablated from the left ventricle. PR interval and QRS duration did not differ between the 2 groups at baseline ECG (ENDO, 102 ± 20 ms and 145 ± 22 ms; EPI, 99 ± 18 ms and 149 ± 27). Delta wave polarity in lead V_1 was positive or isoelectric in all patients. A negative delta wave simultaneously recorded in leads II, III and aVF was found in 15/24 EPI APs and in 3/17 ENDO APs ($p < 0.001$). Among EPI APs, wide and deep Q waves in the inferior leads were found in 3/12 ablated from the middle cardiac vein, and in 0/5 EPI APs ablated from within the CS, representing a highly specific but poorly sensitive marker. Delta wave in ENDO APs was simultaneously positive in leads II, III and aVF in 11/17. QRS patterns associated with endo APs showed typical fragmented rsr^1s^1 in inferior leads in 12/24 cases. *Conclusions:* Delta wave and QRS activation allow distinction of ENDO vs EPI APs located in the PS space in the majority of cases.

1008-11 Recurrence of Conduction Following Catheter Ablation Procedures: Relationship to Electrode Temperatures

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We sought to evaluate the relationship between arrhythmia recurrence following catheter ablation and the electrode temperature at successful ablation sites. 347 patients were studied; (184 F, 163 M, 38 ± 22 yrs). Ablation targets included AVNRT (131 pts), the AV junction (46 pts), and 178 accessory pathways (AP). Catheter ablation was performed with the Atakr ablation system incorporating a thermister in the distal electrode. RF output was automatically varied to achieve a target temperature of ≥70°C. *Results:* Thirty-one patients (9%) developed a recurrence. The relationship between the incidence of recurrence, electrode temperature, and ablation target are shown below:

Target	AVNRT	AP	AV junction	P
Recurrence	7/131 (5%)	23/178 (13%)	1/46 (2%)	0.01
Temp Rec °C	58 ± 9	62 ± 9	50°C	
Temp No Rec °C	60 ± 9	62 ± 10	67 ± 7	
P Value	0.5	0.9	N/A	

In conclusion, recurrence of conduction following catheter ablation is related to the ablation target but not to the electrode temperature. The incidence of recurrence is highest during ablation of accessory pathways and lowest during ablation of AVNRT and the AV junction.

1008-12 Electrophysiologic Characteristics of Manifest Endocardial Accessory Pathways Located in the Left Posteroseptal Space, as Defined by Radiofrequency Current Ablation

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The aim of the study was to assess whether local electrogram (EG) analysis is predictive of the endocardial (ENDO) ventricular (V) insertion of accessory pathways (APs) located in the left postero-septal (L PS) space. In 22 (3.6%) out of 619 manifest APs, the successful (S) out of 14 (2–30) pulses was delivered at the ENDO ventricular aspect of the PS mitral annulus (28 sessions; 4.0 ± 1.3 h duration; 69 ± 38 min fluoroscopy time). Of local EGs retrospectively analyzed, 22 were recorded at S and 49 at unsuccessful (U) ENDO sites in the L PS V, 75 at U risght (R) PS sites, 72 at U epicardial (EPI) sites, of which 52 from within the coronary sinus (CS) and 10 from the middle cardiac vein (MCV). An AP potential could be distinguished in 18/24 (81%) S sites, but also in 41/49 (84%) U sites. Local A-V (42 ± 12 ms vs 43 ± 11 ms) and Δ-V intervals (−5 ± 7 ms vs −2 ± 9 ms) as well as A/V ratio (0.15 vs 0.17) did not differ between S and U sites. Intermittent conduction block was induced during 50% of pulses delivered from the R PS region and 30% of those delivered from both the CS and 3 the MCV. Compared to S sites, A-V was longer at R PS (53 ± 10 ms, $p < 0.01$), and CS (52 ± ms, $p < 0.01$), but not at the MCV (43 ± 12 ms). At all these sites, Δ-V was similar to that at S sites (R PS, −2 ± 8 ms, CS −4 ± 8 ms, MCV, −8 ± 12 ms). *Conclusions:* Geometrical complexity of PS APs is reflected in the set of L PS APs ablated at the ENDO aspect. In such set, AP potentials are frequently recorded at the R PS and L EPI site; also, Δ-V intervals at these sites similar to those at S sites, thus rendering mapping techniques for AP localization and ablation in this region difficult.

1008-13 Incidence of Femoral Vein Occlusion Following Catheter Ablation in Children: Evaluation with Magnetic Resonance Angiography

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Catheter ablation in children requires placement of multiple large bore femoral venous sheaths and catheters. Magnetic resonance (MR) angiography was used to evaluate the effect of indwelling lines on femoral venous blood flow. MR angiography has become an accepted non-invasive technique in evaluating blood vessel anatomy in adults. Between 10/93 and 3/94, eighteen patients scheduled for catheter ablation underwent MR venous angiography. Two-dimensional time of flight MR angiography was performed 24 to 72 hours after catheterization on all patients (13 patients had pre-catheterization studies). All patients received intravenous heparin during the procedure and had aspirin therapy instituted after ablation.

Results: Nineteen catheter ablations and MR angiography studies were performed on the 18 patients (1 patient underwent repeat ablation during the study period). There were 7 females and 11 males. The mean age was 14.91 ± 4.14 (range 8 to 21) years. Patients had three venous sheaths inserted in the left femoral vein (5, 6 and 7 French with external diameters measuring 1.7 mm, 2.0 mm and 2.3 mm respectively) and one sheath in the right femoral vein (7 French). Five patients (26%) had altered venous flow (3 complete obstruction and 2 partial) following catheterization. None of these patients experienced symptoms or complications. One of these five patients had long term follow-up MR angiography which revealed resolution.

Conclusions: There is a moderate occurrence (26%) of venous obstruction following catheter ablation but no related complications. MR venous angiography provides a rapid non-invasive method to evaluate venous flow abnormalities and possibly detect patients at risk for complications.

1008-14 Radiofrequency Catheter Ablation of Left-sided Accessory Pathways: Selection of Coronary Sinus as the Primary Approach

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We employed the coronary sinus (CS) for radiofrequency catheter ablation either as a primary technique or as a secondary approach after failed endocardial attempts in 12 pts (mean age 40 ± 20 yrs) with 14 accessory pathways (AP): 9 left paraseptal, 4 left posterolateral, 1 left anterolateral. AP to local atrial (AP/A) and ventricular (AP/V) electrogram amplitude ratios were calculated. CS angiograms were obtained in 9 pts. *Results:* AP potentials were recorded from the CS in all pts. All APs were successfully ablated using either CS ablation alone or combined with LV endocardial ablation. Catheter ablation within the CS eliminated conduction in 10 of 14 (71.4%) APs (Group 1) with the median of 7 (range 3 to 14) radiofrequency pulses and mean duration of 18 ± 5s at mean power of 22 ± 3W; 5 of these 10 APs were ablated from the CS as a primary method, and the other 5 APs were ablated from the CS after the failure of prior endocardial ablation. In remaining 4 APs (Group 2) the primary CS ablation failed and pathways were ablated with a subsequent endocardial approach. In Groups 1&2, AP/A ratio was 1 ± 0.5 & 0.55 ± 0.1 ($p < 0.05$), and AP/V ratio was 1.2 ± 0.6 & 0.4 ± 0.3 ($p < 0.05$), respectively. In Group 1, 9/10 successful ablations had an AP/A and/or AP/V ratios ≥1, whereas in Group 2 none of the CS recordings had an electrogram ratio ≥1. In all 5 Group 1 pts failing endocardial ablation, an AP potential was not recorded at the, endocardial site. 5 of 7 successfully ablated left paraseptal APs were adjoining the middle cardiac vein or a CS anomaly. CS perforation or thrombosis was not observed. During followup of 10 ± 7 mos there was no recurrence of sustained supraventricular tachycardia in any pt. *Conclusions:* (1) The CS can be used for both mapping as well as safe and effective ablation of left-sided APs with radiofrequency power outputs upto 30W. (2) It can be utilized as a primary ablation approach for APs with AP/A or AP/V ratios ≥1. (3) These findings are most commonly seen in left paraseptal APs in proximity to the middle cardiac vein or a venous anomaly. (4) Endocardial ablation can be reserved for left-sided APs with electrogram ratios <1.