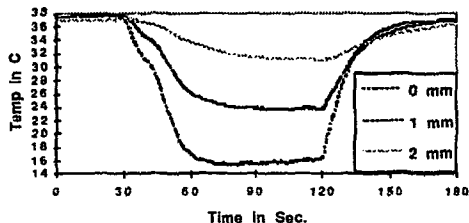


11:15

747-4 Combined Radiofrequency Ablation-Cooling Catheter for Reversible Mapping and Ablation

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Reversible mapping of cardiac arrhythmias has been performed intraoperatively with a 0° C cooling source. However, a steerable cooling catheter for reversible mapping has not yet been developed. We therefore developed and tested a cooling system consisting of a -17 degree C hypertonic saline reservoir and a 7F steerable catheter also capable of radiofrequency ablation (RF). Using excised ovine hearts placed in a 37 degree circulating saline bath, we measured the temperatures (TEMP) at depths of 0 mm, 1 mm, and 2 mm:



The TEMP after 90 seconds of cooling was 16.45 ± 2.11° C at 0 mm compared to 23.92 ± 4.11° C at 1 mm and 31.07 ± 3.89° C at 2 mm depth (p < 0.001). These data suggest that a 7F steerable combined RF ablation-cooling catheter may achieve TEMP suitable for mapping such arrhythmias such as atrial tachycardias and right ventricular outflow tract tachycardias. Further enhancements to achieve lower temperatures at depth may be needed to reversibly map other arrhythmias such as left ventricular tachycardias.

11:30

747-5 RF Ablation in the Coronary Venous System Is Associated With Risk of Coronary Artery Injury Which May Be Prevented by Use of Intravascular Ultrasound

Mauricio Amuda, Hiroshi Nakagawa, K Chandrasekaran, Kenichiro Otomo, Xunzhang Wang, Karen Beckman, James McClelland, Mario Gonzalez, Lawrence Widman, Dwight Reynolds, Ralph Lazzara, Warren Jackman, University of Oklahoma, Oklahoma, City, OK

Sixty six patients with epicardial posteroseptal or left posterior accessory AV pathways (AP) required ablation from the middle cardiac vein (MCV), a coronary sinus diverticulum or other branch or anomaly of the coronary venous system (CVS). 50/66 pts had a previous unsuccessful ablation procedure. Ablation within the CVS was performed with a 4 mm (n = 52) or 8 mm (n = 5) non-irrigated electrode or 5 mm irrigated electrode (n = 9). Ablation was successful in all but 1 pt (pt #2) who had tamponade after ablation in a small vein with a 4 mm electrode. The successful RF application was delivered at 52 ± 8 volts (29 ± 10 watts) for 64 ± 57 seconds. Coronary arteriography was performed before and after ablation with an irrigated electrode in 9 pts. After ablation the distal right coronary artery (RCA) adjacent to the MCV had 70% and 78% narrowing in 2 pts with no ST changes or CK-MB rise and was occluded in 1 pt producing a small-posterobasal infarct. In the first 2 pts, the narrowing was completely resolved at 6 months. In the latter pt, PTCA opened the artery, but there was a 60% residual stenosis at 6 months. No ECG or CK-MB changes were present in the 57 pts who did not undergo arteriography after ablation.

Further ablations within the CVS were postponed until animal studies using an intravascular ultrasound (IVUS) probe in the artery adjacent to the ablation electrode showed that terminating the RF application at the onset of echo changes in the arterial wall (increased echogenicity or wall thickness) prevented significant arterial injury. RF was then delivered in the MCV in 1 pt at 40-46 volts (17-24 watts) and 2 of the 3 RF applications were terminated at 34 and 44 seconds at the onset of increased arterial wall echogenicity and wall thickness. Ablation was successful and resulted in little or no (< 10%) narrowing of the adjacent RCA.

Conclusions: RF ablation within the CVS can result in transient or permanent narrowing of the adjacent coronary artery. The use of IVUS within the coronary artery may allow successful AP ablation within the CVS without significant injury to the adjacent coronary artery.

11:45

747-6 Echocardiographically-Guided Myocardial Lesion Application Using Radiofrequency Energy in a Porcine Model

Volker Menz, Jian-Fang Ren, John J. Michele, Stephen M. Dillon, David J. Callans, Charles D. Gottlieb, Francis E. Marchlinski, David Schwartzman, Philadelphia Heart Institute, Philadelphia PA

The accuracy of a new technique for guiding radiofrequency energy (RF) application was assessed in 15 large (80-120 kg) pigs. Twelve echocardiographically distinct endocardial sites were targeted: 1. crista terminalis at the junction of the SVC orifice; 2. center of the Isthmus between IVC orifice and tricuspid valve; 3. os of the coronary sinus; 4. fossa ovalis; 5. lateral tricuspid annulus at the junction of the posterior and anterior tricuspid valve leaflets; 6. right ventricular outflow tract at the base of the septal leaflet of the pulmonic valve; 7. os left or right superior pulmonary vein; 8. superior border of the os of the left atrial appendage; 9. posterior AV ring at the base of the mitral leaflet; 10. anterior AV ring at the base of the mitral leaflet; 11. apex of the anterolateral LV papillary muscle; 12. apex of the posteromedial LV papillary muscle. A commercial ablation catheter (4 mm electrode) was guided to each site utilizing either intracardiac (12.5 MHz) or multiphase transesophageal (5 MHz) echocardiography. The ablation electrode was fitted with a passive piezoelectric transducer which indicated its position on the echocardiographic image. RF was applied at each site. The distance between the center of the lesion and the site (D, mm) was measured. **Result** [mean ± SD, (range); D = 0 denotes precise localization]:

SITE	1	2	3	4	5	6
	1.1 ± 2.8 (0-9)	0 ± 0 (0)	0 ± 0 (0)	3.7 ± 9.8 (0-26)	1.7 ± 2.9 (0-6)	0 ± 0 (0)
SITE	7	8	9	10	11	12
	3.8 ± 5.2 (0-10)	5.8 ± 5.2 (0-10)	0 ± 0 (0)	2.5 ± 4.9 (0-13)	6.1 ± 13 (0-40)	9.0 ± 10 (0-30)

Conclusion: Certain endocardial sites were consistently targeted with high accuracy, while at other sites were inconsistently targeted. Further evaluation of the utility of echocardiography in catheter ablation is warranted.

748 Transesophageal Echocardiography in Evaluation of Patients With Arterial Embolism

Tuesday, March 26, 1996, 10:30 a.m.—Noon
Orange County Convention Center, Room F3

10:30

748-1 Left Atrial Size, Spontaneous Contrast, and Atrial Appendage Peak Flow Velocity in Relation to Duration of Atrial Fibrillation

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Transesophageal echocardiographic studies have shown that increased left atrial (LA) size, presence of LA spontaneous contrast (LASC +), and low LA appendage (LAA) peak flow velocity (pfv), are associated with increased thromboembolic risk in patients with atrial fibrillation (AF). However, their relation with the duration of AF is not well known. Using transesophageal echocardiography, 165 patients with AF of known duration were studied, in whom LA size (cm²), presence of LASC (+), and LAA-pfv (cm/sec), were related to duration (months) of AF. Results:

	AF duration (months)			
	< 1 (n = 44)	1-3 (n = 34)	3-12 (n = 33)	> 12 (n = 54)
LA size	20.1 ± 7.1*	21.6 ± 6.3	22.8 ± 7.6	23.2 ± 7.5*
LASC +	15 (34%)*	15 (44%)	12 (36%)	32 (59%)*
LAA-pfv	36 ± 19#	29 ± 21	27 ± 12*	24 ± 20#

*p < 0.05; #p < 0.005

No differences in baseline characteristics (age, gender, etiology of AF) were observed among the 4 groups.

Conclusions:

LA size and presence of LASC are directly, and LAA-pfv is inversely related to duration of AF. In time, LAA-pfv decreases earlier and more pronounced than LA size increase and LASC occurrence. LAA-pfv might be used in the management of patients with AF, especially when AF duration is unknown.

TUESDAY ORAL