



Figure

incidence of thrombus formation on the lesions compared with RF and SI RF (0/87 vs. 26/124,  $p<0.01$ ).

**Conclusions:** Cryothermal cooling during RF application resulted in a similar lesion dimension as SI RF. Both Cryo+RF and SI RF created significantly deeper lesions than Cryo, and significantly deeper and larger lesions than RF. The use of Cryo and Cryo+RF were associated with a lower risk of thrombus formation than RF and SI.

## P526 Evaluation of the use of cryothermal ablation for AV node modification



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Experience with AV node modification using radiofrequency (RF) energy is disappointing due to the existence of a narrow margin between insufficient rate control and complete AV block. Our objective was to evaluate the feasibility of AV node modification using cryoenergy.

**Methods:** 15 patients with untreatable atrial tachyarrhythmia received successive cryoenergy applications (Freezor Xtra®, Cryocath) to the inferior, mid, and superior zone of Koch's Triangle. Effects on the AV node were considered significant if the AV nodal Wenckebach cycle length (WCL) or the mean R-R interval during atrial fibrillation increased more than 20% the baseline value, or if AV block occurred.

**Results:** Cryoablation applications (mean temperature  $-77\pm3^\circ\text{C}$  for  $208\pm70$  seconds) produced significant effects on the AV conduction in 14 patients (93%). Cryothermal ablation increased the WCL in 6 of 6 (100%) patients who were in sinus rhythm and increased the mean R-R interval in 7 of 9 (78%) patients who were in atrial fibrillation. However, these effects were completely reversed in 12 of 14 patients within a median of 53 seconds (P25, P75 = 19, 167 seconds). In the other 2 patients AV modification persisted after a 30 minute evaluation period and the procedure was considered successful. However, clinical follow-up showed persistent AV node modification in only 1 of them. High degree AV block occurred in 8 of 15 patients (53%), but it was persistent in only 1 patient (7%). In 12 patients AV conduction remained unmodified despite a total of 83 cryoablation applications aimed at AV node modification or ablation (median 7 applications per patient [P25, P75 = 5, 8 applications]). These patients were treated by RF ablation of the AV node during the same procedure. Using RF energy, permanent complete AV block was obtained in 11 patients with a median of 1 application (P25, P75 = 1, 4 applications per patient). The other patient required a transaortic approach to block the AV node.

**Conclusions:** Cryoenergy applications at the AV node rarely produce persistent effects on the AV conduction even when AV block is desired. This emphasizes the safety of cryoenergy in the ablation of perinodal arrhythmic substrates.

## P527 Left atrial tachycardia after linear lesion ablation in patients with atrial fibrillation – a frequent phenomenon?



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**Background:** Left atrial substrate modification (LASM) by catheter ablation appears to be a successful strategy in the treatment of atrial fibrillation (AF). However, first-time occurrence of left atrial tachycardia (LAT) was described in some pts after LASM. The aim of this study was to analyze the frequency and clinical impact of in our post LASM-pts.

**Method:** 78 pts with symptomatic paroxysmal or persistent AF were treated by LASM. The electromagnetic mapping system CARTO was used for the reconstruction of left atrium and navigation of the ablation catheter (saline irrigated tip). Our ablation concept consisted of a 5 lesion procedure (2 lesions surrounding the septal and the lateral pulmonary veins, a roof lesion, a left atrial isthmus lesion and a linear lesion at the posterior wall). In 78 pts (50 males,  $59.1\pm12$  years) we performed a LASM with 111 procedures (1.4 procedures/pt). During follow up all pts underwent continuous 7-day ECG recording.

**Results:** After ablation 16/78 pts (20%) developed a LAT (cycle length 210-450 ms). We found different tachycardia mechanisms, such as left atrial focal-tachycardia, left atrial macro reentry-tachycardia and pulmonary vein-tachycardias. In 8/16 pts the LAT were drug refractory. 12/16 pts underwent a successful reablation and in two pts the reablation failed. In the remaining two pts we intended to perform a re-ablation later on.

During a mean follow up of 7.5 month 57/78 pts (73%) had sinus rhythm under antiarrhythmic drugs. LAT pts who were successful had no further AF recurrence. We observed no pulmonary vein stenosis or occlusion.

**Conclusion:** Left atrial tachycardia after substrate modification of the left atrium is a frequent phenomenon. Specific re-ablation procedure seems to be very successful.

## P528 First clinical experience and acute results in a European multicenter register with a catheter with a gold tip electrode



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During the ablation of tachycardias both depth and volume of a lesion may be of importance. A European multicentre register was established to analyze the results achieved with an ablation catheter (4 and 8 mm Tip) with a gold tip electrode catheter. The high capacity of this catheter to transduce thermal energy could cause a higher temperature in the tissue compared to catheters coated with conventional (platin-iridium) material. It is conceivable that a faster success could be achieved. 66 patients with different kinds of tachycardias were recruited (W: 33, M: 33, older:  $55\pm17$  years old) during one year. 14 patients had a heart disease. The indication for the ablation procedures were: Atrial flutter (AFI), AV nodal reentry tachycardias (AVNRT), AV nodal ablation and right ventricular out-flow tract tachycardias. All these patients were successfully treated with a gold coated tip ablation catheter (4 or 8 mm tip). The ablation data are summarized in the table. So far no clotting, increased impedance or severe intraprocedural complications were reported.

	No. of patients	Duration of ablation (sec)	No. of RF-applications	X-ray time (min)	Procedure time (min)
AFI	25	$390\pm245$	$10\pm5$	$13\pm5$	$58\pm20$
AVNRT	35	$93\pm114$	$5\pm4$	$7\pm4$	$50\pm23$
AVN	3	$163\pm92$	$4\pm1$	$4\pm4$	$48\pm9$
RVOT	3	$273\pm231$	$8\pm2$	$10\pm0$	$57\pm24$

**Conclusion:** Ablation procedures with a gold tip electrode catheter (4 and 8 mm) showed a high success rate in the treatment of different tachycardias. In this multicentre register so far no intraprocedural complications or clotting on the tip of the ablation catheter were observed. This could be explained by a cooling effect of gold on the tip of the ablation catheter, analogous to the cooling-tip technology.

## P529 Initial experience with catheter ablation of complex arrhythmias using the Ensite-Navx-system and a MRI/CT-guided approach



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Catheter ablation of complex arrhythmias is still technically challenging despite of the use of three-dimensional mapping systems such as the Ensite-Navx-system. These systems are limited to reconstruct the complete "true" anatomy by the reach of the mapping electrode related to the catheter properties. New 3-D imaging systems provide detailed information about the individual anatomy. A 3-D MRI or CT reconstruction of the region of interest can be displayed in the Ensite-Navx-system in a synchronised way during the ablation procedure and might facilitate the intervention.

In a total of 13 patients, cardiac MRI (n=10, 1.5 T, Philips Intera NT) or multi-detector spiral computed tomography (n=3; Sensation 16 and 64, Siemens Medical Solutions) was performed prior to an ablation procedure. For the MRI, a steady state free precession (SSFP) sequence (TR 3.64 ms, TE 1.82 ms, FA 90 degree, resolution  $1.0\times1.1\times1.1\text{ mm}^3$  -  $1.1\times1.29\times1.29\text{ mm}^3$ ) with respiratory navigator gating, vector ECG triggering with arrhythmia rejection and T2-preparation pulse was used. A surface rendered model of the cardiac chamber of interest was created and displayed in the Ensite-Navx-system throughout the ablation procedure.

After performing cardiac MRI or multi-detector spiral computed tomography, catheter ablation was performed using the Ensite-system (n=8) or the Navx-system (n=5). Catheter ablation was performed for atrial fibrillation in 9 patients (A), for right atrial tachycardia in 2 patients (B) and for right ventricular tachycardia in 2 patients (C). The mean procedure time was  $320\pm95$  min. in group A,  $365\pm78$  min. in group B and  $388\pm173$  min. in group C. The knowledge of the individual anatomy resulting from the MRI/CT model facilitated the ablation procedure in all cases. The comparison between the geometry created with the Ensite-Navx-system and the MRI (or CT) scan was very useful to decide whether the geometry created with the mapping system was acceptable or not. This proved to be valuable especially for AF ablations in which the knowledge of