Electrophysiological properties and catheter ablation for cavotricuspid isthmus-independent macroreentrant atrial tachycardia

T. Manaka1, M. Shoda1, K. Tanizaki1, T. Sato1, K. Iijima1, K. Takahashi2, N. Hagiwara3, H. Kasamaki1
1Tokyo Women’s Medical University, Cardiology, Tokyo, Japan; 2Tokyo Women’s Medical University, Pediatric Cardiology, Tokyo, Japan

Objective: catheter ablation (CA) criteria and the identification of slow conduction area (SCA) have not been well studied in cavotricuspid-isthmus independent macroreentrant atrial tachycardias (ATs). Despite the use of new mapping technologies like CARTO, recognizing the details in complicated activation pattern of macroreentrant AT is difficult in many cases and prolonged mapping time and a lot of Radiofrequency (RF) applications are commonly required. We studied the success rate of macroreentrant AT ablation with conventional activation mapping technique.

Methods and results: among 517 consecutive AT cases underwent CA from 1995 to July 2004, 133 cases (81 male, mean 51.5y.o.) with 158 isthmus-independent ATs were studied retrospectively. Isthmus dependent AFL and focal AT cases were excluded. Among 406 inducible stable ATs in 133 cases (64 cases with congenital heart disease, 90 cases with previous open heart surgery), RFCA was performed in 158 stable ATs (mean cycle length 290±78 msec) and delineated the tachycardia in 115ATs (73%) with 3.6±4.2 RF applications. Patients were younger (48.6 vs. 57.8 y.o, p<0.001) in those with previous open heart surgery (OHS) compared to those without OHS, but did not differ in number of induced ATs (2.56 vs. 2.63) and number of ATs which were targeted for RFCA (1.33 vs. 1.44). One hundred fifty eight stable ATs, targeted for RFCA were divided into two groups according to past history of OHS. Group1 108 ATs with OHS, Group2 50 ATs without OHS. Cycle of induced ATs (2.56 vs. 2.63) and number of ATs which were targeted (3.5 vs. 3.9). All RF was single point application, and no linear ablation was applied. In 60 Group1 ATs (56%), SCA was confined to atrioatrial scar on right atrial freewall and in 17 Group1 ATs (16%) to RA septum. RFCA success rate was 83% and 82%, respectively. In contrast, SCA was more likely to be confined to left atrium (23ATs, 46%) in Group2 ATs. Ninety-one of 133 cases can be followed after the procedure (mean 14.2±8.4 months follow-up) and AT recurred in 26% of ATs with RFCA acute success.

Conclusion: cavotricuspid-isthmus independent ATs can be successfully delineated with high resolution activation mapping with conventional technique and single point ablation, especially in patients with previous OHS. Although new mapping technologies like CARTO are highlighted, conventional mapping technique is still important and should be focused on.

MONDAY, 27 JUNE 2005, 14:00-18:00 PAPER HALL

Surgery

369 Block time in the cavotricuspid isthmus during successful burns predicts acute resumption time of conduction

G. Laurent1, G. Bertaux2, A. Bourrier2, M. Fraison2, S. Fromentin2, J.E. Wolf2
1CHU du Bocage, Cardiology Dept., Dijon, France; 2Bocage Hospital, 21000, Dijon, France

Background: A complete line of block (CLOB) in the Cavotricuspid isthmus (CTI) defines the end point of a common atrial flutter (AFL) ablation procedure and the beginning of a 30 minute waiting period (MWP). This study sought to define the real time electrophysiologic predictors of acute CTI conduction recovery (ACTICR) time during AFL radiofrequency (RF) ablation.

Methods and results: A 24-pole mapping catheter (Orbiter TM, Bard Inc, 2-7-2 mm electrode spacing) was positioned via the femoral vein in the coronary sinus (CS), then advanced and rotated so that the distal poles were in the CS and the proximal poles positioned around the tricuspid annulus (TA). When in sinus rhythm, the ablation was performed with pacing at 600 ms in the CS and continuous atrial activation recording along the Orbiter catheter (OC).

Among 350 consecutive patients who underwent a successful AFL ablation (stable CLOB after a 30 MWP, 77 presented an ACTICR (during sinus rhythm) and were included in this study. A total of 141 episodes of ACTICR were observed during a 30 MWP after a CLOB was obtained. Forty five patients had 1 episode, 19 patients had 2, 5 had 3, one had 4, 4 had 5, two had 6 and one patient had 7 recurrences during the same procedure. For each recurrence, further RF applications were needed to obtain a stable CLOB, after a new 30 MWP. With a 24-pole mapping catheter positioned along the CTI, CLOB time (from the beginning of the last RF application to the recording of a CLOB; 20.2 ± 16.8 s) and ACTICR time (from the beginning of the last CLOB to the ACTICR; 51.7 ± 45.3 s), were measured beat to beat. The recurrence episodes increased with increasing CLOB time and decreased over time during the 30MWP. When more than one ACTICR were recorded, we observed statistical differences between the first CLOB time and the last CLOB time (28.2 ± 17.8 vs 20.3 ± 14, p< 0.05). We observed 60% of the ACTICR within the first 5 MWP and 83% within the 10 first MWP. A negative correlation between CLOB time and ACTICR time was found (r = -0.306, p = 0.0027). No ACTICR was observed after the first 12 MWP when a CLOB time was recorded within the first 10 seconds, with a 100% sensibility, specificity, positive and negative predictive values.

Conclusions: CLOB time has predictive value for ACTICR. When a CLOB is obtained within the first 15 s, the observation time can be shortened with safety for only 12 MWP.

370 Surgical resection of postinfarction ventricular tachycardia: a risky enterprise?

P.J.J. Baaten1, N. Van Helden1, J.C. Kelder1, P. Van Dessel1, J.M.T. De Bakker2, L. Boersma1, E. Wieber1, H.A. Van Swieten1, J. Defauw3
1St. Antonius Hospital, Department of Cardiology, Nieuwegein, Netherlands; 2Amsterdam Medical Center, Department of Experimental Cardiology, Amsterdam, Netherlands; 3St. Antonius Hospital, Department of Cardio Thoracic Surgery, Nieuwegein, Netherlands

Purpose: Since 1980 surgical resection of postinfarct VT sites of exit has been done but this approach is currently considered as a risky VT treatment due to assumed additional deterioration of the often severely impaired left ventricular function. Whether this view is valid, has not been determined recently.

Methods: A single center retrospective outcome analysis of consecutively operated patients (1994-2001) was carried out. Preoperative medical history, echocardiographic, angiographic and haemodynamic data were collected. The VT/VF profile including time and type, treatment and information of mapping procedures including 64 electrodes body surface mapping, intraoperative mapping and postoperative VT/VF recurrences were reviewed. The surgical response on all preoperative VT information was categorized into selective and aselective resection of the VT site(s) of exit. Survival and longterm arrhythmic outcome was calculated and compared with selective and aselective resection.

Results: Mean age of 103 pts was 65 yrs, mean NYHA 2, mean EF 27%. Aneurysm resection was done in all, additional bypass in 58, valve surgery in 7 pts. A selective resection was carried out in 65, aselective resection in 35 whereas in 3 pts data were incomplete. Hospital mortality was 2%, mean follow up 3.7 yrs, total 351 patient yrs. After discharge 6 pts died suddenly, 4 pts due to heart failure, 4