8. DIFFERENT MAPPING SYSTEMS AND APPROACHES FOR ABLATION OF ATRIAL FIBRILLATION

8.1 COMPLETE MAPPING SYSTEM FOR ATRIAL FIBRILLATION ABLATION

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Radiofrequency ablation is an established therapeutic option for drug resistant atrial fibrillation. It is also becoming clear that it is necessary to use different approaches in different clinical situations, and often we have to adapt the technique to the patient characteristics.

The electrophysiological approach can be performed with a multipolar pulmonary vein catheter with or without a mapping system whereas the anatomical approach requires a mapping system, for linear lesion creation and block confirmation.

The ENsite System (St.Jude Medical) recently acquired in our EP Lab is a “complete” system. It can be used as a contact mapping system for electroanatomical approach, and for activation map creation; it can be also used as a non contact system for fast linear lesion validation, identification and ablation of linear gaps. The possibility of obtaining immediate non contact activation maps is a great advantage to reach higher success rates and to reduce procedural times.

In Ferrara Ep lab we select the procedure on the target (trigger or atrial substrate) and thanks to flexibility of the Ensite system we can choose the best approach.

8.2 TRANSESOPHAGEAL ECHOCARDIOGRAPHIC MONITORING AND 3D MAPPING GUIDE DURING IRRIGATED-GUIDED ABLATION FOR ATRIAL FIBRILLATION

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Aim: To investigate if transesophageal echocardiography (TEE) during AF ablation contributes to better define anatomy and to evaluate the biophysical phenomena correlated to the irrigated ablation catheter.

Methods: TEE was included in the ablative protocol in 15 patients (pts) (mean age 54±12). Energy was titrated in a stepwise fashion (from 25 to 38 W).

Results: TEE allowed successfully identifying all PVs and guiding the alignment of the mapping catheter at each PV ostium. At baseline, as result of flushing and decannulation of the PVs, a pressure drop occurred as demonstrated by Doppler analysis. The catheter manipulation appears to be easier compared to available cooled 4 mm tip catheters.

PVA has been recently proved as an effective treatment to cure AF. This study establishes the feasibility and efficacy of NAVX® (Endocardial Solutions) in CPVA.

Methods: 30 consecutive patients with paroxysmal (20) or permanent (10) AF underwent ablation. Standard 4 mm irrigated tip catheters were used in all patients. Circumferential lesions were created around ipsilateral veins, using NAVX® guidance. Three ablation lines were added in all pts to prevent postablation reentry (LPV to mitral valve, roof line, between left and right inferior PVOs). Ablation of IVC-TA isthmus was performed in all pts. Voltage map and activation sequence were then generated to validate the ostial sinus and isthmuses block.

Results: No procedural complications. Duration of left atrial procedure: 40 ± 8 minutes (8+2 min mapping, 32 ± 8 min ablation and postablation remapping). Total fluoroscopy time: 10 ± 8 min. At 6-months follow up, 17 (85%) of patients with PAF and 8 (40%) of patients with CAP were free from atrial fibrillation symptomatically and on Holter monitoring.

Conclusions: AF Ablation can be performed both safely and effectively using the NAVX system.

8.5 ABLATION OF ATRIAL FIBRILLATION USING A NEW 8 mm TIP CATHETER WITH 4 THERMOCOUPLE SENSORS AND BASKET 31 mm MAPPING SYSTEM

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In order to treat atrial fibrillation (AF) by radiofrequency (RF) ablation different approaches have been proposed. In this paper we describe our experience in AF ablation using a new multisense 8 mm tip catheter.

24 patients (Pts) mean age 62 years, underwent AF ablation. The procedure end point was PV insulation, superior vena cava (SVC) insulation and right flutter lesion. PV and SVC were mapped using a 31 mm basket catheter with 64 electrodes. The lesions were performed with a new 8 mm tip bi-directional steerable catheter, with 4 thermocouples located in the tip. The system is lead by the sensor that achieves the highest temperature to avoid high temperature on small electrode area. No complications occurred during the procedures.

Complete conduction block in 4 PV was obtained in 20 Pts (83%). During a median follow up of 4 months, only 6 Pts (25%) experienced recurrence of AF. There is some concern in using an 8 mm tip catheter with high voltage setting in the LA because of embolic risk. Using the multisense catheter we never documented thrombus on the electrode (even after high voltage delivery). The catheter manipulation appears to be easier compared to available cooled 4 mm tip catheters.

8.5 SAFETY, EFFICACY AND REDUCTION IN RADIATION EXPOSURE IN CATHETER ABLATION PROCEDURES USING LOCALISA SYSTEM

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Some fluoroscopic intracardiac navigation systems today allow an important reduction in radiation exposure (RE) during catheter ablation procedures (CAP).

Objective: To evaluate the benefits obtained by reducing RE during CAP using the LocalLisa(®)(Medtronic, Minneapolis) (LOCA), a non fluoroscopic system based on Ohm’s law.

Method: We retrospectively compared the RE time in 2 homogeneous groups of patients (pts) submitted to CAP for atrial tachyarrhythmias. The LOCA group was composed of 80 pts with an average age of 60 years and without organic cardiopathy in 53% of cases. The following CAP was performed: 29 AV node reentrant tachycardias (AVNRT), 38 atrial flutter (AF), 3 AV node ablation (AV), 7 atrial tachycardias (AT). The Control group was composed of an equal number of consecutive and similar procedures were performed as before but without the LOCA system. A further analysis was obtained between two consecutive periods of LOCA utilization (May 2003 and December 2003 first period and January 2004 and February 2005 second period) and Control group.

Results: Radiation exposure time – Minutes (mean±SD) (range)

<table>
<thead>
<tr>
<th></th>
<th>LocalLisa®Gr</th>
<th>Control Gr</th>
<th>Reduction (%)</th>
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</thead>
<tbody>
<tr>
<td>AF</td>
<td>29±13 (11-66)</td>
<td>22±6 (10-35)</td>
<td>p value &lt;0.01</td>
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<tr>
<td>AVNRT</td>
<td>19±13 (5-49)</td>
<td>9±3 (3-18)</td>
<td>p value &lt;0.00</td>
</tr>
<tr>
<td>AT</td>
<td>15±21 (7-60)</td>
<td>16±3 (3-9)</td>
<td>NS</td>
</tr>
<tr>
<td>All</td>
<td>45±15 (31-66)</td>
<td>32±4 (25-39)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>28±16 (5-90)</td>
<td>14±8 (3-35)</td>
<td>p value &lt;0.01</td>
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No differences were observed between the two periods of LOCA utilization and Control group. The reduction in RE time in the AV group was higher but not statistically significant owing to the limited number of cases. No problems occurred during the CAP with the higher safety of LOCA especially in the identification of the ablation target with the possibility of easier recovery of mapped points before.