

AEPC YIA Session (II-AEPCYIA)

Chair: Hiroshi Ono (National Center for Child Health and Development, Japan)

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[II-AEPCYIA-2]Contact force guided radiofrequency current application at developing myocardium : lesion size and coronary artery involvement

○David Backhoff^{1,2}, Matthias Müller¹, Teresa Betz¹, Andreas Arnold¹, Heike Schneider¹, Thomas Paul¹, Ulrich Krause¹ (1.Department of Pediatric Cardiology and Congenital Heart Disease, University Hospital Giessen, Justus Liebig Universität, Germany, 2.Department of Pediatric Cardiology and Congenital Heart Disease, Pediatric Heart Center, Justus-Liebig-University of Giessen, Giessen, Germany.)

Introduction

Catheter contact is one key determinant of lesion size in radiofrequency catheter ablation (RFA). Monitoring of contact force (CF) during RFA has been shown to improve efficacy of RFA in experimental settings as well as in adult patients. Value of CF monitoring in pediatric patients has not been systematically studied yet.

Methods

RFA with continuous CF monitoring was performed in 24 piglets (median weight 18.5 kg) using a 7F TactiCath Quartz RF ablation catheter (Abott, Abbott Park, Illinois, USA). A total of 7 lesions were induced in each animal applying low (10-20 g) or high (40-60 g) CF. RF energy was delivered with a target temperature of 65 ° C at 30 W for 30 seconds. Coronary angiography was performed prior and immediately after RF application. Animals were assigned to repeat coronary angiography followed by heart removal after 48 h (n=12) or 6 months (n=12). Lesions with surrounding myocardium were excised, fixated and stained. Lesion volumes were measured by microscopic planimetry.

Results

A total of 148/172(86%) of applied lesions were identified in the explanted hearts. Only in the subset of lesions at the AV annulus 6 month after ablation, lesion size and proportion of transmural lesions were higher in the high CF group while CF had no impact on lesion size and extension in all lesions after 48 h as well as in the atrial and ventricular lesions after 6 months. Additional parameters as Lesion-Size-Index and Force-Time-Integral were also not related to lesion size. Coronary artery damage was not related to catheter CF and was present in 2 animals after 48 h and in 1 after 6 months.

Conclusions

In our experimental setting in piglets lesion size was not related to catheter CF. Transmural extension of the RF lesions involving the layers of the coronary arteries was frequently noted irrespective of CF. Coronary artery narrowing was present in 3/24 animals. According to these findings it may be speculated that even lower CF during RF ablation in infants and toddlers may be equally effective and less traumatic than applied in adults. Impact of CF monitoring during conventional RF ablation in children requires further investigations.