Empirically intraoperative cryoablation of right-sided accessory pathway during ongoing cardiopulmonary bypass for surgical repair in Ebstein's anomaly patient

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Introduction: Performing ablation for accessory pathway (AP) in Ebstein’s anomaly of tricuspid valve (TV) has been challenging due to various factors such as presence of multiple accessory pathways, difficulty interpreting complex and fractionated signals during mapping or difficulty stabilizing of ablation catheter. Intraoperative cryo-maze procedure has been performed as adjunctive treatment of atrial fibrillation or intra-atrial reentrant tachycardia but never been reported for accessory pathway ablation.

Methods: N/A

Result: A six-year old girl, 17 kg who has severe Ebstein’s anomaly of TV with moderate TV regurgitation and atrial septal defect (ASD). TV ring size was 46 mm. Her baseline EKG [figure 1] showed sinus rhythm with ventricular preexcitation suggestive of right-sided AP. Plan for intraoperative ablation was pursued during surgical repair for TV and ASD closure. Pt went into unstable supraventricular tachycardia (SVT) after induction of anesthesia which required synchronized cardioversion. Right atrial incision was performed after cardiopulmonary bypass initiated. Right atrium was large with severe apical displacement of septal and posterior leaflet of TV. From EKG, prediction of AP site using delta wave axis putting our speculation to right posterior region or even in mid-cardiac vein due to negative delta wave in inferior leads and positive in aVL. However, delta wave axis interpretation could be complicated by possible presence of possible multiple APs. Coronary sinus opening and true TV ring along posterior border of TV were identified. Surgical cryoablation probe was pre-curved along patient’s TV ring. Empiric one minute of near half-circled single application of cryo-energy was applied from lateral to coronary sinus os (6 o’clock) toward 11 o’clock marked of TV ring by excluding septal side of TV and Koch triangle area [figure 2]. After ablation, the remaining surgical repair of TV and ASD were proceed. Post operative EKG showed normal sinus rhythm without ventricular preexcitation. No further postoperative SVT or evidence of antegrade conduction down AP after surgery and at one-month follow up period [figure 3].

Conclusion: Empirical cryoablation of accessory pathway can be expeditiously and safely performed in young patient with relatively small heart size whom undergoing open heart surgery.