Figure 1. Initial 12-lead electrocardiogram showing isorhythmic AV dissociation, atrial rate 110 per min with ventriculophasic sinus arrhythmia, junctional escape rhythm 55 per minute with narrow QRS complex. Corrected QT interval was 549 milliseconds by using Bazett’s formula.
Figure 2. Subsequent 12-lead electrocardiogram showing that PR interval became shortened and P wave was buried in the initial portion of the following QRS complex. P-P and R-R interval remained constant.
Figure 3. Fluoroscopic image in RAO 30° view during electrophysiologic study. Three intracardiac catheters were inserted via the right femoral vein. Right atrial quadripolar catheter was placed in high right atrium near the sinoatrial node. His bundle quadripolar catheter was in close proximity to the compact atrioventricular node recording his bundle deflection. Right ventricular quadripolar catheter was positioned near the right ventricular apex. Transvenous temporary pacemaker was inserted via the right internal jugular vein and tip of the lead was seated at the right ventricular apex. (RA = Right Atrial Catheter, His = His Bundle Catheter, RV = Right Ventricular Catheter, TP = Temporary Pacemaker Lead)
Figure 4. Surface electrocardiogram in lead I, aVF, and V1 and intracardiac electrogram recorded from right atrial, His bundle and right ventricular catheters at a paper speed of 31 mm/second. P wave and QRS complex were completely dissociated in an isorhythmic fashion with an approximate integral ratio of 2:1. A-A and V-V interval were constant measuring 606 milliseconds and 1182 milliseconds respectively. Atrial rate was higher than ventricular rate. V-A interval was progressively prolonged and variable. H-V interval was short and fixed. Complete Heart Block was confirmed and diagnosed on both surface and intracardiac electrograms.
Figure 5. Surface electrocardiogram in lead I, aVF, and V1 and intracardiac electrogram recorded from right atrial, His bundle and right ventricular catheters at a paper speed of 63 mm/second. Each of the ventricular signals was preceded by a His bundle deflection and completely dissociated from the atrial signals indicating that the level of block was above the His bundle. (A = Atrial electrogram, H = His bundle electrogram, V = Ventricular electrogram)
Figure 6. Surface electrocardiogram in lead I, aVF, and V1 and intracardiac electrogram recorded from right atrial, His bundle and right ventricular catheters at a paper speed of 63 mm/second. Rapid atrial pacing near the sinoatrial node at a constant cycle length of 400 ms. Corrected Sinus Node Recovery Time (Sinus Recovery Time - Sinus Cycle Length) was 98 milliseconds proving normal sinoatrial node function.
Figure 7. Continuous electrocardiographic monitoring in lead I, II and III revealed initiation of polymorphic ventricular tachycardia with "R on T" phenomenon after long pause due to slow junctional escape rhythm followed by another pause and initiation of sustained Torsade de pointes in long-short sequence.