904-47 Permanent Overdrive Atrial Pacing in Chronic Management of Atrial Reentrant Tachycardias in Postoperative Patients with Congenital Heart Disease
Pietro Roganese, Fabrizio Drago. Department of Pediatric Cardiology Bambino Gesù Hospital, Rome, Italy.

Sustained atrial tachycardias occurring after surgery for congenital heart disease, are often difficult to control by antiarrhythmic drugs and by atrial tachycardia pacing. We implanted a permanent pacing system in 11 pts with drug resistant recurrent atrial tachycardias. 7 pts were male and 4 fe- male; mean age was 7.4 years (range 1 to 28 yrs); mean time from surgery to the first documented atrial tachycardia was 2.2 years (range 1 month to 9 yrs). All pts had been unsuccessfully treated with two to five antiarrhythmic drugs before pacing. At implantation the atrial pacing rate was programmed to be 20% faster than the mean diurnal spontaneous rate. Individualized programs of pacemaker rate settings were then selected following serial 24 hours Holter monitoring, to obtain a prevailing paced atrial rhythm. Mean follow-up was 3.4 years (range 6 mos to 5 yrs). 3 pts had recurrences of atrial tachycardia during the first six months after the implantation, 8 pts remained arrhythmia free. No patient had late recurrences and only two are still on antiarrhythmic drug therapy. In conclusion: permanent overdrive atrial pacing is a very useful tool in chronic management of postoperative atrial reentrant tachycardias.

904-48 Risk Factors for Venous Obstruction in Children with Transvenous Pacing Leads
Felicia H. Figa, Jean-Luc Bigras, Brian W. McCrindle, Christine Boutin, Robert M. Hamilton, Robert M. Gov. The Hospital for Sick Children, University of Toronto, Toronto, Canada.

To determine the incidence and risk factors for venous obstruction (OBST), we prospectively evaluated with echocardiography 83 of 70 eligible children who had transvenous pacing leads placed between 1985 and 1990. The median (range) age at initial implantation was 7.6 yrs (0.7, 16), and 8 patients had subsequent additional implants. OBST was defined as a combination of Doppler flow abnormalities in the SVC or innominate (innV) vein and a 2D echo appearance of vessel narrowing and/or the clinical appearance of dilated superficial veins. OBST was noted in 13/83 (21%) patients, with location of OBST at the distal subclavian vein in 5, SVC in 4, innV-SVC junction in 2, and multiple sites in 2. Venography in 11 of these 11 patients (2 refused) showed that the severity of OBST (as defined by % luminal narrowing) was complete (100%) in 3 patients, severe (>90%) in 4, and moderate (60-80%) in 4. Of the 8 patients who had additional implants, 3 (38%) had OBST. Risk factors for OBST in the remaining 56 single implant patients (10 with OBST; 18%) were explored. Patients with vs. without OBST did not differ regarding date or duration of implant, number of leads, lead material or the presence of associated heart defects or surgery. Patients with OBST were younger at implant (median 5.6 vs. 9.0 yrs; p < 0.05). Total cross-sectional area of lead(s) was related to body surface area at implant (RATIO). Patients with OBST had higher mean RATIO (7.6 ± 1.6 mm²/m²) than patients without OBST (4.9 ± 2.0 mm²/m²; p < 0.0002). After controlling for RATIO in multiple logistic regression, no other variable predicted OBST. Receiver-operator characteristic curves showed a RATIO of >6.6 to best predict OBST, with a sensitivity of 90% and specificity of 84%.

Conclusion: Since pacing is lifelong, sizing of transvenous leads to the child is important to prevent OBST and preserve venous access.

904-49 Children Below 6 Years of Age with Accessory Pathway Related Tachyarrhythmias. Whom to Ablat at and How
Joachim Hebe, Christian Weiß, Jürgen Siebels, Matthias Antz, Riccardo Cappato, Thomas Meiniert, Karl H. Kuck. Department of Cardiology, University Hospital, Eppendorf, Germany; St. Georg Hospital, Hamburg, Germany.

By August 1994, a total of 103 children (<15 yrs) underwent radio-frequency current (RFC) ablation for accessory pathway (AP) mediated supraventricular tachycardia (SVT). Of these, 23 were infants aged less than 6 years (11 f, 12 m; 3.9 ± 1.6 yrs). All infants had suffered from recurrent or almost incessant episodes of SVT, which were diagnosed at birth in 13 and prenatally in 4. SVT was refractory to an antiarrhythmic regimen with 3 to 6 different agents. Tachycardia-related symptoms included cardiac arrest in 2 infants with WPW, syncope in 3 pts, reduced physical stress capacity in 11 and SVT-related chest pain in 1. Thirteen pts had an overt AP with an additional concealed pathway in 2; the remaining 10 pts had a concealed AP in 6 of which it sustained the permanent form of junctional reciprocating tachycardia (PJRT). In the latter group 3 infants had reduced left ventricular function (Fraction shortening 13 to 21). In 11 infants a single b- or 6 French steerable catheter was used for therapeutic intervention. In 9 infants a second catheter was required for diagnostic purposes. Within 25 sessions, 22 infants were cured by a median of 7 RFC applications. Procedure duration was 3.4 ± 1.9 hours, with a median radiation exposure time of 29.0 minutes. During a 19 month follow-up (median), 20/22 infants were asymptomatic and required no antiarrhythmic medication. Two pts had recurrences of SVT (1 PJRT), one of which underwent a successful repeat session. Tachycardia related left ventricular function evolved to normal values in all 3 infants within the follow-up period. There were no serious complications.

Conclusions: 1) RFC-ablation of accessory pathway-mediated supraventricular tachycardia is feasible, safe and effective in children aged less than 6 years. 2) Reduced innsiveness due to simplified catheter techniques is achievable in this particular patient population. 3) In children with an age <6 years, indication for RFC-ablation is restrictive and should be provided in pts with severe symptoms due to drug-refractory SVT.

904-50 Pacemaker Cardioverter Defibrillators in Young Patients
Mary C. Sokoloski, Brian K. O’Connor, Sherry J. Taylor, Vicki L. Zeigler, Christopher L. Case, Paul C. Gillette. South Carolina Children’s Heart Center, Medical University of South Carolina, Charleston, SC.

Although life-threatening ventricular dysrhythmias are uncommon in young patients, there are underlying heart diseases that may predispose these patients to ventricular tachycardia or ventricular fibrillation (VT/VF). To test the hypothesis that tiered therapy with a pacemaker-cardioverter defibrillator (PCD) is a therapeutic option for young patients at risk for sudden death, we reviewed our experience with these devices. Nine patients, aged 9-33 years (17.7 ± 7, mean ± SD) at the time of implantation, received PCD’s between March, 1993, and the present. Post-operative diagnoses included complete or partial tetrology of Fallot (2), Senning for D-transposition of the great arteries (1), double outlet right ventricle, status post ventricular septal defect closure baffling the left ventricle to the aorta (1), and Fontan for single ventricle with pulmonary stenosis (1). Other diagnoses included Wolff-Parkinson-White (WPW) (1), WPW and dilated cardiomyopathy (1), arrhythmogenic right ventricular dysplasia (1), and long QT syndrome (1). All patients had inducible or clinical unstable VT/VF before implantation except one patient with WPW who had a family history of sudden death. Seven of the patients had failed antiarrhythmics before implantation. Defibrillator electrode configurations consisted of epicardial patches (4), transvenous alone (3), and transvenous with subcutaneous patch(es) (2). In 10.4 ± 5 (range 2-17) months of follow-up, overdrive pacing was successful in one patient, and there have been appropriate defibrillator discharges in five patients (56%). Seven of the nine patients remain on antiarrhythmics. There was only one complication, a moderate pericardial effusion two months following transvenous lead implantation in a 24.3 kg nine-year-old. No system has required revision to date.

Conclusion: In relatively short-term follow-up over 50% of our patients successfully have used tiered therapy from pacemaker-cardioverter defibrillators. This implies that these therapies protect selected young patients from sudden cardiac death, potentially greatly increasing their life span.

904-51 Long-term Outcome in Fontan Patients with Pacemakers
Steven B. Fishberger, Gil Wernovsky, Thomas L. Gentles, Walter J. Gamble, John E. Mayer Jr, Edward P. Walsh. Children’s Hospital, Boston, MA.

To further examine the outcome of Fontan pts with pacemakers we evaluated our database of 500 consecutive pts who underwent a Fontan operation at Children’s Hospital in Boston between April, 1973 and August 1991 (mean follow up 3.5 ± 3.9 yrs, range 0-20.2 yrs). Pacemakers were implanted in 47