Electrophysiologic studies (EPS) were performed to evaluate the mechanisms of regular, wide QRS tachycardia (RWT) in 109 patients with WPW syndrome. The RWT was induced by atrial and/or ventricular pacing in 16 patients (15%), 9 males and 7 females, ranging in age from 10 to 56 years, including 4 patients with Ebstein's anomaly. The induction was more frequent in type B (23%) than in type A (8%). Ten patients showed orthodromic reentrant tachycardia (ORT) with bundle branch block (BBB). One of 10 patients had not only ORT but also AV reentrant tachycardia using nodoventricular fiber as the antegrade route. Antidromic reentrant tachycardia was seen in 3 patients. Two patients revealed atrial flutter with 2:1 AV conduction via Kent bundle or normal AV conduction system. The remaining one patient showed SA nodal reentrant tachycardia with 1:1 AV conduction over Kent bundle. The QRS complex during ORT was 130-160 (mean 141) msec in duration, and revealed right BBB pattern in 9 of 10 patients. On the other hand, during RWT with other mechanisms than ORT, QRS duration was 160 msec or more in 5 of 7 patients, and left BBB pattern was seen in 5 of 7 patients. Accessory pathway (AP) participated in the reentrant circuit (RC) in 13 patients, while AP was not involved in the RC in 3 patients. It is essential for the optimal treatment to clarify the relation between AP and RC using EPS. In addition, QRS pattern during RWT serves as an aid to differentiate the underlying mechanisms of RWT.

-210-

DIAGNOSIS OF THE SITE OF KENT'S BUNDLE BY BODY SURFACE MAPPING

-AN EXPERIMENTAL STUDY USING IN SITU ISOLATED BEATING HEART MODEL-

Sunao Watanabe, Yoko Yagi, Akira Shiikawa, Hiromi Kurosawa, Masahiro Endo, Hitoshi Koyanagi, Hiroshi Kasanuki, Keizo Tanaka

Heart Institute of Japan, Tokyo Women's Medical College,

In order to establish the non-invasive diagnosis of the site of Kent's bundle by body surface mapping, we performed an experimental study using 16 mongrel dogs in which 'in situ isolated beating heart model' were made and delta wave was forged by pacing various sites of juxta-annular ventricle. Pacing was synchronized with atrial excitation with delay of 20-30 msec from it.

In control state (sinus rhythm) body surface isopotential map pattern was unchanged after mid-sternal splitting was made and closed with suture. Map pattern was also unchanged after in situ isolated model was made and opening wound was closed. These findings showed that the experimental method was thought to be appropriate for studying the map pattern.

Kent's bundle simulation experiment showed that the body surface isopotential map pattern was characteristic according to the localization of the accessory pathway and that the site of Kent's bundle was able to be diagnosed by the localization of point minimum and point maximum and by the orientation of point maximum-minimum axis.

-211-

A EXPERIMENTAL STUDY OF WPW SYNDROME BY USING VECTORCARDIOGRAM

Ryukichi Hirose, Tetsuo Numa, Koji Kibota, Takayuki Ikeda, and Nobu Hattori

The First Department of Internal Medicine, Kanazawa University, Kanazawa

We studied the correlation between the locations of the accessory pathways and vectorcardiographic findings. Ventricular preexcitation was experimentally produced on epicardial (EP) and endocardial (ED) sites in dogs. Ventricular stimulation sites were left and right anterior (LA, RA), lateral (LL, RL), posterior (LP, RP), posteroparaseptal (LPPS, RPPS) walls, and posterior septums (LPS, RPS). The 20 msec initial QRS vector (IV) and the max. QRS vector (MV) were measured. Results: The directions of IV of LA, LL, LP and LPPS were shifted from anterior, inferior and right to anterior, superior and left, and those of RA, RL, RP and RPPS shifted from anterior, inferior and left to superior and left in this order. The directions of MV of LA, LL, LP and LPPS were shifted from anterior, inferior and right to anterior, superior and left in this order, but those of RA, RL, RP and RPPS shifted from posterior, inferior and left to horizontal and left in this order. But 29% of RPPS resembled left cardiac type. The directions of IV and MV of ED were almost as same as those of EP, but IV of LL (EP) was significantly oriented more rightward than that of LL (ED). IV of LPS and RPS were equally oriented anteriorly and leftward. MV of LPS was oriented anteriorly, superiorly and leftward, that of RPS was oriented more posteriorly, inferiorly and leftward than that of LPS. There was no difference between the direction of MV of LPS and that of LPPS. Conclusions: Vectorcardiographic findings correlate closely with the locations of the accessory pathways. But this vectorcardiographic classification has some limitations in differentiating EP from ED, and determining the locations of the accessory pathways in the posteroparaseptal and septal sites.

-212-

CHARACTERISTIC FINDINGS ON SURFACE ECG, SURFACE AND EPICARDIAL MAPPING IN THE DIFFERENTIATION OF SEPTAL AND RIGHT POSTERIOR ACCESSORY PATHWAY IN WOLFF-PARKINSON-WHITE SYNDROME

FUMITAKA ISOBE, TSUYOSHI FUJITA, YOSHITSUGU KITOH, KUNIYOSHI OHARA, YOSHIO KOSAKAI, TOHRU OHE*, SHIROU KAMAKURA*, KATSURO SHIMOMURA*

National Cardiovascular Center, Osaka, Japan
Department of Cardiovascular Surgery and Cardiology*

Because anatomically the septum is very complicated, it is desirable to predict the localization of accessory pathway (AP) whether it locates on the septum or not before the interruption procedure on AP in WPW syndrome. We investigated whether there were any difference on the findings in surface ECG, surface and epicardial mapping between the septal and right posterior AP.

On surface ECG, the direction of the delta wave was I,V5:(+), III,aVf:(-), (+), V1:(+/-) in the septal AP and I,V5:(+), III,aVf:(-), V1:(-), (+/-) in the right posterior AP. A case of QS pattern in V1, defined as Type C of Ueda's classification, exhibited the AP in spite of previously speculated.

By surface mapping, minimum of -0.15 mV of QRS predicted well accurately for the localization of the AP, however, it could not differentiate in a positive way the septal AP from the right posterior AP, because minimums were sometimes intermingled