Tissue samples taken from 23 autopsied hearts without AV blocks from the neonate to the aged were cut serially from AV node to bundle branch as described previously.

Cytofluorometric DNA determinations of 200 isolated AV nodal cells were performed. The area of the AV node, AV nodal cells and fibrous tissue within the node were determined using the colour image analyzer on Masson's Trichrome stained $4\mu\text{m}$ preparations cut $200\mu\text{m}$ apart.

Consequently, respective volume of them was calculated in each heart.

No polyploidization progressed in the AV nodal cells irrespective of heart weights and ages. This implies that these cells have poor ability of DNA synthesis like neurons.

Volume of AV node, AV nodal cells and fibrous tissue in the node increased until 10 years of age.

From 10 to 60 years of age, volume of AV nodal cells remained constant but thereafter, volume of it decreased significantly, probably due to cell loss with aging.

There was no correlation between age and volume of fibrous tissue in adulthood.

This study implies that growth and aging of AV nodal cells are very similar to those of neurons.

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STEREOGRAPHIC DISPLAY OF SURGICAL LANDMARKS FOR THE ATRIOVENTRICULAR CONDUCTION SYSTEM BY MEANS OF A MICROCOMPUTER, AND ITS CLINICAL SIGNIFICANCE

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Conduction disturbances induced by intracardiac repair of congenital heart disease remain an unsolved problem. The primary object of our study was to determine the precise topographic relationship of the conduction system with the intracardiac structure, thereby establishing intracardiac landmarks for prevention of such complications. Particular attention was paid in this report to the topographic relationship between conduction tissues and papillary muscles of the right ventricle, since our previous study has demonstrated the existence of a pattern for both structures that may play the role of surgical guide in locating conduction tissues, particularly the right bundle branch (RBB).

Of 35 cardiac specimens subjected to histological evaluation for the conduction system, 10 were stereographically analyzed by means of a microcomputer. The specimens consisted of 2 normal hearts, 4 hearts with VSD, 2 with TOF, 2 with common A-V canal. All of them were studied by 10 micrometer serial section technique across the His bundle at an obtuse angle, followed by Masson-Goldner's staining and photographing. For stereographic reconstruction, data of the intracardiac structure in these pictures were input into a microcomputer by means of a digitizer.

Such a stereographic presentation has contributed to better understanding for not only the course of the atrioventricular conduction system but also the relationship of the RBB with the papillary muscles of the right ventricle, particularly the upper and uppermost accessory papillary muscle defined by the authors.

These findings have provided us a practical guideline for suture placement. Atrioventricular conduction disturbance, including bilateral bundle branch block, has not been encountered for the past three years, namely, since such histo-

logic information and spatial recognition of the conduction system began to be applied clinically.

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MYOCARDITIS AND CONDUCTION SYSTEM INJURY

-HISTOPATHOLOGICAL STUDY BASED ON SERIAL SECTIONS IN 50 CASES-

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The conduction system of the heart with autopsy proven active myocarditis or healed myocarditis was examined. For the purpose, serial sections by the method of Lev were prepared, and examined under the light microscopy. The conducting cell injuries were determined as significant when reduction of their number was 50% or above.

Clinical diagnoses of 50 cases were acute myocarditis (M) 1, collagen disease 6, sepsis 2, pneumonia 2, malignant tumor and leukemia 6, sick sinus syndrome 5, other arrhythmia and conduction disturbance 8, hypertrophic cardiomyopathy (HCM) 1, dilated cardiomyopathy 16, valvular heart disease 3. ECG findings; atrial fibrillation or flutter 25, SSS (Rubenstein-III) 9, AV block (2nd degree) 17, WPW syndrome 1, LAH 4, LPH 5, LBBB 4, RBBB 3 and bilateral BBB 5.

Autopsy diagnosis; idiopathic active M 18, M accompanied by collagen disease 9, bacterial or fungal M 4, cardiac sarcoidosis 3, M accompanied by malignant tumor or leukemia 3, healed M 13. Histological findings; Lesions in SA node and its junction 30, in atrial muscle 22, approach to AV node 14, AV node 12, His bundle 13, LPF 25, LAF 21, RBB 10. As the pathogenesis of ECG abnormality and heart failure, chronic M was frequently revealed. Three cases of cardiac sarcoidosis with 3rd degree AV block exhibited granuloma in AV node and atrial septum. Healed M was found in a sudden-death case of HCM treated for ventricular arrhythmia, and in a case of WPW syndrome accompanied by aortic valve insufficiency. Lesions in conduction system were divided into two groups, group 1 - injuries of SA node, atrial muscle, AV node and His bundle by perimyocarditis, group 2 - LBB, RBB and Purkinje fibers by endomyocarditis. Chronic M was also divided to perimyocarditis presented by arrhythmia and isolated M presented by heart failure.

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CLINICAL FINDINGS OF THE BIOPSY PROVEN MYOCARDITIS OR HEALED MYOCARDITIS AND IMMUNOHISTOLOGICAL INVESTIGATION WITH MONOCLONAL ANTIBODIES

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Clinical and immunohistological findings of the biopsy proven myocarditis or healed myocarditis were studied. Out of 61 patients (pts); 19 were active myocarditis (M) and 42 healed state of myocarditis (HM).