Problems of myocardial biopsy

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It seems easy to talk about the problems of a new technique, especially in the case of a technique for obtaining human myocardial tissue *in vivo*. Surprisingly, the main problems do not lie in the technique itself, but rather in the decision whether such a biopsy is indicated in a certain case or not.

Endomyocardial biopsy of the RV by the Konno method has been performed in ninety patients. The small biotome was introduced percutaneously by way of the right vena femoralis. The large biotome was not used because of its rigidity.

Generally, it was easier to introduce the biotome into a dilated RV than into a normal sized or even small RV. Two to four biopsy specimens were usually taken. No complications occurred. In two cases a biopsy by thoracotomy was performed by the surgeons.

The first problem one has to discuss before performing a myocardial biopsy is the question as to which kind of myocardial disease is suspected. If it is a question of a patchy distribution of the diseased myocardium, it is not advisable to use a blind method. Neither the endomyocardial method nor the trans-thoracic needle biopsy is likely to provide representative specimens.

A somewhat better chance for a morphological diagnosis is given in cases of suspected myocarditis, but it is still necessary to hit a focus of inflammation.

Cases of restrictive cardiomyopathy offer the best chance of obtaining a morphologically supported diagnosis by means of an endomyocardial biopsy.

It is pure chance if one diagnoses a heart tumour by the endomyocardial technique. In one case a diagnostic specimen was successfully obtained. In two other cases, the tumour was localized by angiography but it was not possible to obtain a specimen from it because it was located too deep inside the wall and could not be reached. In future cases of suspected tumour, localization will be attempted and the surgeons asked to perform a thoracotomy.

Another problem is that of the number of speci-

mens necessary to ensure the proper representation of the morphological condition of the myocardium. As the number of specimens has to be limited because of the patient's safety, the question to be discussed is whether four specimens are enough.

The histological basis for diagnosis could be improved if the most extensively affected cavity could be determined and the specimen taken from it.

Another problem is that of the stage of the disease. At the time of biopsy the tissue reaction may be far less pronounced than at the time of autopsy, so the diagnosis may be missed in life. But the contrary may also happen. An inflammatory process may be already healed so that the histology will show scars only and no diagnosis concerning the aetiology of the disease can be expected at this time. The same may be true for a toxic myocardial disease, for example in the so-called alcoholic cardiomyopathy.

Case presentation: A 44-year-old male alcoholic was referred to our hospital because of high grade cardiac failure. The heart was grossly dilated. The ECG showed atrial flutter, the heart rate was 185/min, RA mean pressure was 11 mmHg, the cardiac index was 2.0 l/min/m². At this stage an endomyocardial biopsy of the RV was performed. The electronmicroscopic picture (Fig. 1) showed a dilated sarcoplasmic reticulum, the mitochondrial matrix had disappeared and the cristae fragmented. After 3 weeks of treatment with bed rest, digitalis and diuretics the patient recovered, the heart size was considerably smaller and he was in sinus rhythm. The heart rate was 75/min, RA mean pressure was 4.5 mmHg, the cardiac index was 4.0 l/min/m². At this time another endomyocardial biopsy was taken. The electronmicroscopic picture (Fig. 1b) showed a normal finding in the mitochondria and also in the sarcoplasmic reticulum (for histological technique see Klein and Harmjanz, 1975).

A well timed biopsy in carefully selected patients will be necessary to get a helpful diagnosis from the pathologist.

The lack of a gross pathology at the moment of

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FIG. 1. (a) In the stage of cardiac failure; (b) at normal haemodynamics after treatment. $\times 24,000$.

myocardial biopsy can be partly compensated by an angiocardiogram.

The advantage of myocardial biopsy consists of the opportunity to study morphological changes in relation to myocardial function and metabolism. We are in the early stages, and considerable work has to be done to prove the validity of this method in the field of cardiomyopathies.

References

- KLEIN, H. & HARMJANZ, D. (1975) Effect of ethanol infusion on the ultrastructure of human myocardium. *Postgraduate Medical Journal*, **51**, 325.
- KONNO, S. & SAKAKIBARA, S. (1963) Endo-myocardial biopsy. *Diseases of the Chest*, **44**, 345.
- SHIREY, E.K., HAWK, W.A., MUKERJI, D. & EFFLER, D.B. (1972) Percutaneous myocardial biopsy of the left ventricle: experience in 198 patients. *Circulation*, **46**, 112.