

## 5) Spleen

## Spleen Scanning

S. KARIYONE

*First Division, Dept. of Int. Med., Faculty of Med., Kyoto Univ., Kyoto*

There are two methods for visualization of the spleen; X-ray photograph with or without special treatment and scintigraphy using  $^{197}\text{Hg}$  or  $^{203}\text{Hg}$  labelled MHP or  $^{51}\text{Cr}$  labelled heated red cell. However, it is difficult to get a good and complete shape of the spleen by X-ray. While, figures of the spleen can be easily described from different direction, for example, posterior, anterior and laterals, by the technique of scintiscanning. So, it is concluded that scintigraphy is the best method for visualization of the spleen figures.

The spleen has a solid complexity in its form. Then, combination of scintigrams from different direction are much beneficial for imagination of the real solid shape of this organ. Expression of exact size by scintigraphy was examined in a scintiscanner using a model. Adequate condition was found easily by adjusting the cut off level and the rate down of radioactivity and by choosing a collimator. Using this condition, splenic volume were calculated by the following formula;

$$\frac{\text{area of lateral scan. (cm}^2\text{)} \times \text{posterior scan. (cm}^2\text{)}}{\text{height. (cm)} \times \text{body weight (kg)}}$$

$$= \text{splenic volume (cm}^3\text{)}/\text{kg B.W.}$$

Of course, they were not a real volume but they were useful enough for the comparison of spleen size in various patients.

Splenic volume indices were compared in various diseases. In the cases with hepatic cirrhosis, congestive splenomegaly, hemolytic anemia, polycythemia vera, myelofibrosis and chronic myeloid leukemia, the splenic volume indices were over 6—7 times larger than that

in normal cases. In some cases of chronic hepatitis, iron deficiency anemia, hypoplastic anemia and ITP, the splenic volume indices were often 2—3 times larger than normal. The small spleen were found sometimes in the cases of hypoplastic anemia after steroid therapy in long periode.

The meaning of enlargement of the spleen were discussed in several clinical states. Relationship between leukocyte count in peripheral blood and spleen volume showed good correlation in congestive splenomegaly. There were a significant correlation between splenic volume and sequestration of red cell expressed by  $^{59}\text{Fe}$  activity on the spleen in ferrokinetics study in congestive splenomegaly. The clearance of  $^{51}\text{Cr}$  labelled heated red cell in peripheral blood showed a significant correlation to the splenic volume, suggesting the ability of red cell uptake were elevated in enlarged spleen.

The usefulness of spleen scanning:

- 1) Spleen scanning is a best and easiest method for visualization of position and shape of spleen.
- 2) Spleen scintigraphy describes only normal functioning tissue of the spleen.
- 3) In adequate condition, splenic volume can be calculated significantly.

The limitation of spleen scanning:

- 1) Splenic scintigraphy on up and down direction can not be get by present techniques.
- 2) Since the shape of the spleen are much complicated, calculation of real splenic volume is scarcely possible.