soon as possible. Scintigrams obtained were compared with findings in arteriography. In
csidered as the result of ischemia or outflow
block of the transplanted liver. Next, body
surface counting curve in the experimental
heterotopic transplanted liver was classified
into the three patterns.
The first pattern which was obtained im-
mediately after surgery, or about one week
after surgery with the use of immunosup-
pressive substance, showed almost normal.
The 2nd pattern which was obtained about
one week after surgery without the use of
immunosuppressive substance showed slow
elevation at initial phase, followed by equi-
librium curve which was continued 90 minutes
duration and didn’t show decreasing tendency.
The 3rd pattern which was obtained also
about one week after surgery without the
use of immunosuppressive substance showed
steep elevation at initial phase followed by
slowly decreasing curve without showing any
equilibrium. The 2nd and 3rd patterns were
thought as the result of rejection.

Effects of the Highly Oxygenated Blood to the Hepatic Function

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Oxygen effects by intravascular administra-
tion of the hydrogen peroxide have been ex-
perimentally studied by means of measure-
ment of the hepatic uptake rate of $^{198}\text{Au}$
colloid and of the disappearance rate of $^{131}\text{I}$
labelled Rose Bengal in peripheral blood be-
fore and after intravenous drop of 0.5% solu-
tion of the hydrogen peroxide.
Prior to the experiment, LD$_{500}$ of 0.1% to
1.0% of this solution and oxygen pressure in
the peripheral venous blood were also ex-
amined and it was recognized that the toxicity
of the solution was very low and the oxygen
pressure has immediately elevated after
starting of administration of the hydrogen
peroxide and gradually decreased to the nor-
mal level after end of the drip infusion within
10 to 15 minutes.
By the hyperoxygenation, the hepatic up-
take rate of $^{198}\text{Au}$ colloid has decreased in
proportion of the H$_2$O$_2$ concentration, while,
the peripheral disappearance rate of $^{131}\text{I}$
labelled Rose Bengal has not varied. So, it
is concluded that the hyperoxygenation has
made decrease of the hepatic blood flow and
no conspicuous change to the hepatic function.

Studies on Hepatic Circulation in Liver Diseases with the Use of RI

IV. Alteration of Hepatic Blood Flow in Standing and Walking

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In our previous study on the liver blood
circulation in hepatic diseases with use of
$^{198}\text{Au}$-colloid, we found that the liver ac-
cumulation indices (KL) of $^{198}\text{Au}$-colloid due
to the changes in the position of the body
remained unaffected or increased in contrast
to its decrease in the control group and
chronic hepatitis and reported that this is due
to the mode of the portal blood flow. In the
present study for the purpose to observe the
mode of hepatic blood flow in standing and
walking an attempt was made to device a
suitable scintillation detector with the surface attachment (for the details of the construction refer to Topic No. 28). Such a detector should not only be a portable one but also must have a constant relation of the relative position to liver, and it should be provided with a sufficient insulation as well as be easily adaptable. For this reason a surface apparatus was devised. In this instance, a special care was taken to minimize the change in the relative position to be caused by the alterations in the body position, on the basis of the shift in the boundary line of the lung-liver as well as of the liver accumulation KL curves at different postures as observed by roentgenograms.

As for the method of detecting the mode of hepatic blood flow, the subject is made to take a supine position for taking the recordings of liver accumulation KL curves, then standing position to ascertain the stability of the curves. This standing position is kept for 10 minutes to record KL curves, then a relaxed position is kept for 10 minutes, and again make the subject to assume the standing position again to confirm the plateau. Similar procedures are taken in the recordings of the walking period, but in this instance, the individual is made to take 100 steps per minutes for ten minutes. The subjects of our test were consisted of 13 normal control, 7 cases of chronic hepatitis, and 12 cases of liver cirrhosis. In each group KL decreases in the standing posture and then it increases in the walking, but the KL in standing. As for the changes of KL at different postures, the patient with liver cirrhosis definitely gives a lower KL value than the control group. Further, in studying the changes of KL values precisely with each disease, in the control KL value in the standing position decreases about 20% in average from that in the supine position, but on assuming the walking again this decrease recovers to 70% decrease. In chronic hepatitis there can be recognized no definite tendency, but KL values both in standing and supine postures decrease to some extent. Liver cirrhosis group shows approximately the similar pattern to that of the control, i.e. the KL values are on the whole lower and the changes during the walk tend to be slightly greater.

Hepatic Circulation and Thoracic Lymph Flow in the Hepatic Cirrhosis

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It is important to consider a role of the hepatic lymph as well as hepatic vessels in hepatic circulation, especially disturbance of hepatic outflow.

In acute experiments of the constriction of supradiaphragmatic inferior vena cava in dogs, portal pressure was elevated markedly by ligation of thoracic duct but recovered to normal levels immediately after release of ligated thoracic duct.

We studied of the three groups of dogs:

first group: ascitic dogs by constriction of supradiaphragmatic inferior vena cava

second group: dogs of cardiac cirrhosis treated tricuspid valvotomy and pulmonary artery stenosis

third group: dogs of liver fibrosis induced by CCl4

Hepatic blood flow by using colloidal gold (198Au) decreased 77% in first group and 51% in the second but third group was almost normal. The thoracic lymph from polyethylene tube cannulated into thoracic duct was collected. Thoracic lymph flow rate increased not only markedly in first and second group but also moderately in third group. The increase of thoracic lymph flow rate was in proportion to elevation of hepatic venous pressure. The radioactive sodium (24Na) was