Study Abroad in West Germany and the Fall of the Berlin Wall

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In 1961, the Berlin Wall was built by East Germany all around West Berlin. East Berlin was governed by the Soviet Union, and West Berlin was governed by France, Great Britain, and the United States. West Berlin and West Germany were connected by autobahns, railroads and planes, and West Berlin developed with West Germany. On November 9, 1989, the Berlin Wall suddenly collapsed. Many people were destroying the Berlin Wall with a hammer, as if they vented their anger for years. The work to remove the Berlin Wall began the next day, and East and West Germany were unified on October 3, the following year.

I tried two studies on liver transplantation in West Germany. One was an experimental study on the effects of the donor's fasting and graft viability after liver transplantation, and the other was a study on the role of Kupffer cells in the induction of tolerance after liver transplantation. It has been suggested that poor nutritional status of donors promotes preservation injury and contributes to a decrease in the viability of the transplanted liver, and hepatic Kupffer cells are involved in the establishment of induction of specific immunological tolerance in donor specific blood transfusion.

Key words: Berlin Wall, liver transplantation, donor's fasting, donor specific blood transfusion

Introduction

I graduated from Juntendo university school of medicine in 1989 and entered the first department of surgery after working as a surgical resident. I entered the first department of surgery. I obtained my degree in 1988, and in 1989, I was given the opportunity to study abroad, which I had long wanted, and was assigned to the university of Münster in West Germany. At the time I studied abroad Germany was divided into east and west. The University of Münster where I studied abroad was in the state of Nordrhein-Westfalen. Berlin was located in East Germany, and West Berlin was just an isolated island in East Germany (Figure 1).

Construction and fall of the Berlin Wall

In 1961, the Berlin Wall was built by East Germany all around West Berlin. East Berlin was

Germany 1945-90

Figure 1 At the time I studied abroad Germany was divided into east and west. Blue is West Germany and red is East Germany. The University of Münster where I studied abroad was in the state of Nordrhein-Westfalen. Berlin was located in East Germany, and West Berlin was just an isolated island in East Germany.

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governed by the Soviet Union, and West Berlin was governed by France, Great Britain, and the United States. West Berlin and West Germany were connected by autobahns, railroads and planes, and West Berlin developed with West Germany.

On November 9, 1989, the Berlin Wall suddenly collapsed. Many people were destroying the Berlin Wall with a hammer. It was as if they were venting years worth of anger. The work to remove the Berlin Wall began the next day, and East and West Germany were unified on October 3, the following year.

We also traveled to Berlin at once. The slide is the Berlin Wall and the Brandenburg Gate. The four-headed carriage (quadriga) and the goddess Victoria are facing backwards, and you can see that this photo was taken from East Berlin (Figure 2).

Around the Berlin Wall, there were many people breaking the wall and selling pieces of it. I think the prices ranged from 500 yen to 1000 yen per pieces. I bought a lot of and gave them out as souvenirs when I returned to Japan, and many people including the professor were pleased with it (Figure 3).

I was surprised to hear that the East German car Trabant (nicknamed Trabi) had a terrible exhaust gas and its body was made of paper. East and West Germany were unified, and the owners of Trabi, who saw Mercedes-Benz and BMW in West Germany, were disappointed and dumped them in the trash.

Figure 2 The figure is the Berlin Wall and the Brandenburg Gate. The four-headed carriage (quadriga) and the goddess Victoria are facing backwards, and you can see that this photo was taken from East Berlin.

Figure 3 I bought a lot of debris of the Berlin Wall as a souvenir when I returned to Japan, and many people including the professor were pleased with it.

Two studies on liver transplantation in West Germany

(1) Method of the rat liver transplantation

No one at Juntendo at that time succeeded in a rat liver transplantation. I studied abroad in Germany and tried while reading a treatise, but even after two months, I couldn't get a surviving case, and the experimental plan was already dead-locked. Just when I was desperate, I got information that there was a Japanese person experimenting with rat liver transplantation at the University of Cologne, so I went to the University of Cologne as a last hope.

There, a professor from Hokkaido University was very successful in rat liver transplantation, and when he talked about my situation, he generously provided his own handwritten procedure manual for rat liver transplantation. After that, I also succeeded in rat liver transplantation in more than a dozen cases. The slide is that the upper hepatic vena cava, which has been sutured with 7-0 proline (Figure 4).

Figure 5 shows reconstructions of the portal vein and the inferior vena cava by Kamada's cuff method. The bile duct is reconstructed by end-to-end anastomosis with a stent tube. The real pleasure of liver transplantation is the moment when the color of the liver changes from white to red due to reperfusion of the portal vein (Figure 5).

Figure 4 The figure is that the upper hepatic vena cava has been sutured with 7-0 proline.

Figure 5 The figure shows reconstructions of the portal vein and the inferior vena cava by Kamada's cuff method. The bile duct is reconstructed by end-to-end anastomosis with a stent tube.

(2) Experimental studies on relationship between the effects of the donor's fasting and graft viability after liver transplantation

We conducted a study called "Experimental studies on relationship between the effects of the donor's fasting and graft viability after liver transplantation"¹⁾.

Using Wister male rats, the donors were classified into 6 groups with fasting times of 0 hour, 48 hours, and 72 hours, and donor liver cold ischemic times of 0 hour and 6 hours. That is, the fasting time and cold ischemic time were 0 hour and 1 hour in group 1, 0 hour and 6 hours in group 2, 48 hours and 1 hour in group 3, 48 hours and 6 hours in group 4, 72 hours and 1 hour in group 5, and 72 hours and 6 hours in group 6, respectively. Euro-Collins solution was used as the preservation

solution, but it is generally said that the Euro-Collins solution can preserve the donor liver for up to 6 hours. The measurement items were bile excretion 3 hours after liver transplantation, survival rate, liver tissue ATP, ADP, adenylate energy charge during liver cold preservation, liver weight, and liver tissue blood flow after liver transplantation. Histological examinations were also performed.

Bile excretion 3 hours after liver transplantation was significantly decreased in groups 4 and 5, and no bile excretion was observed in group 6, showing primary graft nonfunction (Figure 6).

The survival rate after liver transplantation was 80% or more in groups 1, 2 and 3, but all died within 24 hours in groups 4 and 6 and all died within 28 days in group 5, no long term survival was obtained (Figure 7).

Liver tissue ATP during hepatic cold preservation was significantly lower in the 72-hour fasting group (Figure 8).

Liver tissue blood flow after liver transplantation was measured by the hydrogen gas clearance method by developing a coil-shaped electrode. Liver tissue blood flow after liver transplantation was significantly reduced in group 5 and markedly decreased in groups 4 and 6.

Electron micrographs of liver tissue showed marked degeneration of sinusoidal endothelial cells and microvilli fragmentation of the Disse cavity in Groups 4 and 6.

Figure 6 Bile excretion 3 hours after liver transplantation was significantly decreased in groups 4 and 5, and no bile excretion was observed in group 6, showing primary graft nonfunction.

Figure 7 The survival rate after liver transplantation was 80% or more in groups 1, 2 and 3, but all died within 24 hours in groups 4 and 6 and all died within 28 days in group 5, no long term survival was obtained.

Figure 8 Liver tissue ATP during hepatic cold preservation was significantly lower in the 72-hour fasting group.

(3) Study on role of Kupffer cells in the induction of tolerance after liver transplantation

Next, we conducted a study on “Role of Kupffer cells in the induction of tolerance after liver transplantation”²⁾.

The subjects used DA rats as donors and Lewis rats as recipients. This combination is a rejection model, in which acute rejection occurs within 12

days and all rats die. Group classification is as follows: control group; group in which only liver transplantation was performed, donor specific blood transfusion (DST) group; group which administered to recipient 1 ml of blood collected from donor 7 days before liver transplantation, and Gd+DST group; group in which gadolinium was administered to recipient 9 and 8 days before transplantation, and DST was performed 7 days before transplantation. In order to investigate the effect of gadolinium on phagocytes of Kupffer cells, the rats were euthanized. They received colloid carbon intravenously and died fifteen minutes later; liver tissue was observed by light and electron microscopy. The measurement items were the survival rate and average survival time of recipient after liver transplantation, and hepatic histopathological findings 4 and 7 days after liver transplantation.

Gadolinium is a type of metal salt that suppresses the activity of the reticuloendothelial system, including hepatic Kupffer cells. Electron micrographic examination clearly shows the presence of numerous carbon particles within the cytoplasmic vacuoles of Kupffer cells (Figure 9). In contrast, Kupffer cells in gadolinium-pretreated rat showed almost no carbon uptake (Figure 10).

The mean survival time was significantly increased to 52.7 days in the DST group compared to 11.6 days in the control group. In Gd+DST group, the survival time was 27.7 days, which was significantly shorter than that in the DST group.

The survival rate of recipients after liver transplantation was up to 70 days in the DST group, and

Figure 9 Electron micrographic examination clearly shows the presence of numerous carbon particles within the cytoplasmic vacuoles of Kupffer cells.

Figure 10 Kupffer cells in gadolinium-pretreated rat showed almost no carbon uptake.

the survival rate was significantly improved compared to the control group. In contrast, Gd+DST group had a significantly lower survival rate than the DST group.

Conclusions

It has been suggested that poor nutritional status of donors promotes preservation injury and contrib-

utes to a decrease in the viability of transplanted liver, and hepatic Kupffer cells are involved in the establishment of induction of specific immunological tolerance in donor specific blood transfusion.

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