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Treatment for Cerebral Embolism following Valve Replacement

——Especially About Autoblood Pumping Therapy——

Kenji Honda, M. D.*

Slide 1. Chairman, Ladies and Gentlemen:

It is a great pleasure and an honor for Dr. Yu's giving me a chance to present about treatment for cerebral embolism following valve replacement.

Since 1957, I have performed 507 operations for congenital and acquired heart diseases in Fukushima Medical College Hospital.

From 1957 to 1970, open heart surgeries were mainly performed using hypothemia method by surface cooling. Over all mortality rate was 14.1% at that time. From 1971, I switched hypothermia method to cardiopulmonary bypass. Although the indication of cardiac surgery was far extended, mortality rate was markedly decreased to 4.8%.

Slide 2. Among these 507 cases, prosthethetic valve replacement was performed in the 40 cases. They were 31 cases of mitral valve replacement, 3 cases of mitral valve replacement and tricuspid annuloplasty, 2 cases of mitral valve replacement and aortic valvuloplasty, 2 cases of aortic valve replacement and 2 cases of double valve replacement.

Five cases were died in hospital and other 2 cases were died during follow-up period.

Regarding as the complications following valve replacement, cerebral embolism was found in 10 cases. Thrombosed valve, disc variance and gastrointestinal bleeding was noticed in one case respectively. Serum hepatitis was found in 9 cases.

Now Im going to discuss about the problems of cerebral embolism following valve replacement.

Slide 3. I would like to tell Urokinase therapy for cerebral embolism. Urokinase works as plasminogen activator. So dissolution of intravascular clots is expected when Urokinase was given intravenously.

The administration of Urokinase is shown in this slide and I got excellent results of 75% of patients with cerebral embolism.

Slide 4. Cerebral embolism following valve replacement occurred in 10 patients. Among

* *Fukushima Medical College*

them, 6 patients were male and 4 patients were female. Ages were 16 to 51 years old.

Symptoms were only dizziness in light cases, hemiplegia, coma and akinetic mutism in severe cases.

In these 10 patients, 2 patients (case No. 3 and 8) did not require any special treatment and they recovered completely. Other 8 patients received Urokinase therapy.

In 6 out of 8 patients, Results of Urokinase therapy were excellent and they recovered without any sequela. However, in other 2 patients (case No. 1 and 10) effects of Urokinase were not satisfactory. Therefore I applied autoblood pumping therepy in these 2 patients.

Slide 5. Now I will explain about the technique and results of autoblood pumping therapy.

At first insert a angiographic catheter, usually I used Cordis 8 F catheter, into carotid or vertebral arteries by Seldinger's method under fluoroscopy.

Then suck patient's blood into 20 ml syringe with sodium citrate and inject blood, rapidly into carotid or vertebral artery by hand.

Usually I repeat this pumping 30-50 times at one therapy. After these procedure carotid angiogram or vertebral angiogram is performed through this catheter.

Slide 6. Here you can see the slide of autoblood pumping therapy.

Slide 7. I will show you a case of autoblood pumping therapy. Patient is 16 years old female. She was operated upon MVR and left atrial aneurysmorrhaphy because of prominent MI and left atrial aneurysm.

The postoperative course was well. However, at 16th postoperative day she suddenly developed akinetic mutism.

Immediately after this episode, Urokinase was given intravenously. But no improvement was noticed.

So I decided to do autoblood pumping therapy. The lst autoblood pumping therapy was performed at 35 days after the episode.

Next day, her emotional expression was noticed and consciousness became clear. Then she could take food orally. However, dysarthria and incontinentia were not improved and she could not stand up. I performed the 2nd autoblood pumping therapy at 55 days after the episode.

Effects of this procedure were prominent. Incontinentia was improved and she could talk, read a book and write a letter. At last 25 days after the 2nd autoblood pumping therapy, she could walk without any support.

Slide 8. Now I will show you vertebral angiogram just taken after the episode. Basilar artery was obstructed and posterior cerebral artery could not be seen in this film.

Slide 9. This is a schema of the angiogram just taken after the episode.

Slide 10. After the 2nd autoblood pumping therapy, vascularization at the area of basilar artery was noticed and posterior cerebsal artery was observed in this film.

Slide 11. This is a schema of angiogram taken after the 2nd autoblood pumping

therapy.

Slide 12. Here is electrical encephalogram just taken after the episode. You can see only slow waves in this EEG. There is no reaction even to the light. This means function of brain markedly damaged.

Slide 13. This EEG was recorded after the 2nd antoblood pumping therapy. We can not find slow waves in this EEG. This means her brain function was markedly improved.

Slide 14. This picture was taken just after the episode. She could not react to any stimulation. She just opened her eyes and horizontal nystagmus was observed.

Slide 15. Her toes showed spastic paralysis.

Slide 16. 8 days after the lst autoblood pumping therapy, she could eat milk by herself.

Slide 17. 5 dayt after the 2nd autoblood pumping therapy, she could stand up.

Slide 18. 6 days after the 2nd autoblood pumping therapy, she could write her name exactly.

Slide 19. 25 days after the 2nd autoblood pumping therapy, she could walk without any support.

She was recovered completely from akinetic mutism by autoblood pumping therapy and has no sequela at present time.

Slide 20. Concerning the cerebral embolism following valve replacement, even though anticoagulant therapy was good enough to keep thrombotest below 30%, there is some cases in which cerebral embolism was noticed.

I tried to make an analysis of this question. I examined realationship between thrombotest and coagulation time by Lee-White method.

All patients received sodium warfarin and thrombotest showed blow 30% in 74 out of 95 cases.

In the 74 cases, elongation of coagulation time over 12 minutes was noticed in 26 cases (35%). Other 48 cases (65%) showed no elongation of coagulation time.

As you know, Sodium warfarine suppressed II, VII, IX and X coagulation factors and thrombotest is only indicator of these coagulation factors. There were some cases in which coagulation time still remain normal level, even though thrombotest showed below 30%.

Therefore, I think we need check not only thrombotest but also coagulation time during anticoagulant therapy.

Slide 21. Recently, Sodium warfarin with Dipyridamole or Clofibrate was given to prevent cerebral embolism after valve replacement.

Screen Filtration Pressure which measures platelet aggregation, was markedly decreased in the cases receiving Dipyridamole or Clofibrate.

Therefore, I would like recommend you to give Sodium Warfarin with Dipyridamole or Clofibrate to prevent embolic complications following valve replacement.