

## SUMMARY

The dissertation gives an account of the investigation into cases when patients having undergone open heart surgery at the Department of Cardiac Surgery of UD MHSC died. Special attention was paid to complications affecting the central nervous system (CNS) in the first place. A separate chapter was devoted to interventions performed in the case of Jehovah's Witnesses, and also the legal and ethical problems of such operations.

In my study, I have surveyed the damage to the CNS accompanied with macroscopic and microscopic changes during open heart surgery supported by ECC. In the knowledge of the clinical course of the disease and findings of autopsy I looked for the causes of brain damage. I studied which of the four brain-specific enzymes (aldolase, LDH, PK and LAP) shows activity changes in the CSF due to brain damage suffered during the operation. Is there any relationship between the type and extent of brain damage and the changes in enzyme activity? Can open heart operations be safely performed in Jehovah's Witnesses without the violation of their religious beliefs, principles and rights? I studied what the constitution and laws of the Republic of Hungary say about the "bloodless" treatment given to Jehovah's Witnesses.

The postmortem examination of patients having undergone open heart surgery enabled us to observe the following: Both diffuse and focal brain damage may emerge in association with heart surgery. This can appear both as haemorrhage and emollition. Multifactorial causes are likely to be in the background of brain damage, but the changes basically result from generalised hypoxia, embolisation or the combination of the two. Low cerebral perfusion pressure and embolisation are blamed for diffuse brain damage and focal changes, respectively. Vascular disease causes the emollition of cerebral white matter, while valvular diseases may result in embolic changes of the cerebral cortex. Diabetes, hypertension and old age – and especially their combination – present a high factor of risk. Surgical treatment of Jehovah's Witnesses poses a special problem, since they refuse any blood and blood product, including autologous transfusion. However, the cardiac surgical intervention of Jehovah's Witnesses can be safely performed by using a few special techniques developed based on the 'routine protocol'. The Hungarian Constitution and laws strictly outline the standard operating protocols in these cases.