

# **Development of the brain protection during thoracic aorta surgery Arterial inflow site and management of the brain protection – our experiences in the period 1997-2005**

T. Danek, R. Brat, J. Gaj, Ostrava, Czech Republic

## **OBJECTIVES:**

Operations on the thoracic aorta using hypothermic circulatory arrest are still associated with significant morbidity and mortality due to neurological complications. During the last decades, different cerebral protection techniques have been introduced into clinical practice to reduce the incidence of such complications. To reduce brain damage, we use deep hypothermic circulatory arrest (DHCA) with or without selective antegrade cerebral perfusion (SACP). We use three different arterial inflow sites: femoral artery, brachiocephalic trunk or right axillary artery. We review the outcome after the thoracic aorta surgery.

## **METHODS:**

Between 1/1997 and 10/2005, 191 patients underwent the thoracic aorta surgery, 80 of them underwent aortic resection with circulatory arrest. Only DHCA was performed in 39 cases (49%), DHCA and SACP were performed in 41 cases (51%). Femoral artery approach we used in 69 cases, right subclavian artery or brachiocephalic trunk approach we used in 27 cases. 58 patients (30%) had acute dissection, 19 patients (10%) chronic dissection, 111 patients (59%) aneurysm and 2 patients (1%) had others diagnosis.

## **RESULTS:**

The total arch replacement was performed in 25 patients. (31%), hemiarch in 16 patients. (22%) and „open anastomosis“ in 38 patients (47%). Overall hospital mortality was 18 patients (22%) of them who underwent deep hypothermic circulatory arrest, in acute dissection 12 patients (15%), in chronic dissection 3 patients (3,75%) and 3 patients with aneurysm (3,75%). Permanent neurological dysfunction developed in 4 patients (5%) and all this patients had acute dissection treated by surgery in DHCA without SACP. Transient neurological dysfunction developed in 6 pt. (7.5%). Right axillary artery and brachiocephalic trunk cannulation were successfully performed and there was only one complication in the first patient (dissection after decannulation, treated by the implantation of the stent).

## **CONCLUSIONS:**

The development of the brain protection during thoracic aorta surgery in this period shows that the selective antegrade cerebral perfusion via right axillary artery, or via brachiocephalic trunk provides an excellent approach for aortic arch surgery with optimized arterial body perfusion and allows cerebral perfusion during circulatory arrest and may safely be used for arterial inflow during surgery.