

DESCENDING THORACIC AND THORACOABDOMINAL ANEURYSM

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DESCENDENTNÉ HRUDNÉ A HRUDNOBRUŠNÉ ANEURYZMY

Abstract

Silvay G, Reich DL, Ergin MA, Griep RB:
Descending thoracic and thoracoabdominal aneurysm
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The low incidence of permanent spinal cord injury in our most recent cohort (Group II) of patients suggests that serial sacrifice of intersegmental vessels, careful monitoring of spinal cord function are effective in preventing paraplegia after descending thoracic and thoracoabdominal aneurysm operations. Updated anesthetic and postoperative care minimized overall mortality risk. (*Ref. 9.*)

Key words: thoracic aneurysm, thoracoabdominal aneurysm, spinal cord, paraplegia, surgery, prevention.

Two hundred thirty three patients undergoing surgical therapy of the descending thoracic and thoracoabdominal aorta for aneurysmal disease at the Mount Sinai Medical Center between January 1986 and February 1996 were included in the study. One hundred thirty eight patients in group I underwent aneurysm operations before November 1993, when somatosensory evoked potentials (SSEPs) monitoring became available, and 95 patients in group II underwent operation with SSEPs, mild hypothermia, maintenance of high normal blood pressures, and cerebrospinal drainage. Preoperative characteristics such as sex, age, etiology of aneurysm, emergency (urgent or elective) operation, and reoperation did not differ between groups, nor did operative variables such as extent of resection and incidence of rupture. Group I had slightly more smokers and fewer hypertensive individuals. Group II patients had a significantly better outcome with respect to in-hospital mortality (10.5 % vs 18 %, $p=0.045$) and paraplegia (2 % vs 8 %, $p=0.008$). The extent of aneurysm was a major determinant of incident of paraplegia. The low paraplegia rate in group II was achieved without reattachment of a single intercostal or lumbar artery. No patient with fewer than 10 intersegmental arteries severed had paraplegia, and spinal cord ischemia was reversible in three

Abstrakt

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Nízky výskyt trvalých následkov poškodenia miechy v našom najnovšom súbore pacientov (súbor II) naznačuje účinnosť obeťovania intersegmentálnych ciev a starostlivého monitorovania funkcií miechy v prevencii paraplégie po operáciách descendntných hrudných a hrudnobrušných aneuryzmiem. Aplikácia najnovších anestetických metód a moderná pooperačná starostlivosť minimalizujú všeobecné riziko úmrtnosti. (*Lit. 9.*)

Kľúčové slová: hrudná aneuryzma, hrudno-brušná aneuryzma, miecha, paraplégia, chirurgia, prevencia.

patients after adjunctive maneuvers were performed to improve perfusion, suggesting that spinal cord blood supply is unlikely to depend on a single "artery of Adamkiewicz".

By multivariate analysis, rupture and diabetes were associated with significantly higher in-hospital mortality, and smoking greatly increased the incidence of paraplegia.

All patients had "standard" cardiac anesthesia and monitoring+SSEPs. In 90 % patients we used one lung ventilation, which may improve surgical visualization in the left chest and decreased lung trauma.

We are using Daily (1) Sanford classification of aortic dissection consisting of only two groups: Type A, which includes all patients in whom there is any involvement of the ascending aorta regardless of the site of intimal tear; and Type B, in which the dissection process starts distally to left subclavian artery and is confined to the portion of the aorta distal to this point.

Acute dissection of the aorta is a catastrophic event that is characterized by separation of the layers of the media by a column of circulating and pulsating blood so as to create a "false lumen". Blood flow in the false lumen may cause proximal or distal extension of the dissection, compression of the true lu-

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men, occlusion of the major tributaries of the aorta and, ultimately, death due to ischemia or rupture. Mortality in acute Type B dissection of the aorta without surgical intervention is about 40 %.

Etiology

Atherosclerosis, hypertension, degeneration of the aortic media (Marfan's Syndrome), infection (bacteria, fungi, syphilis), trauma, iatrogenic (following open heart surgery, due to aortic cannulation or aortic cross-clamping). However, atherosclerosis is the most common cause of Type B aneurysm.

Clinical presentation

Patients with Type B aneurysm may be asymptomatic, some may give a history of hypertension and others may have pain, which usually start due to expansion of aneurysm or dissection. The pain may be located precordially, radiate to the jaw or the back. Symptoms (dyspnea, cough) are usually the result of pressure on trachea and bronchi. In patients with dissecting Type B aneurysm, the anatomy of the left main bronchus is not infrequently altered in such a way that placement of a left endobronchial tube may be difficult (cause complications, including rupture of the aorta), therefore placement of right-sided endobronchial tube may be beneficial. The high incidence of coexisting in these patients (general atherosclerosis, may involve coronary, carotid, renal arteries; COPD; hypertension) is common.

Diagnosis

Methods and evaluation of the progress of the aortic dissection: 1. Aortogram; 2. Ultrasonography; 3. CT-Scan; 4. MRI; 5. Transesophageal echocardiography (very important during operation to evaluate eventual progress of aortic dissection).

Symptomatic acute Type B dissections unresponsive to medical treatment and symptomatic descending thoracic and thoracoabdominal aortic aneurysm are all indicated for surgery. The major issue in this area is operative indications for the patient with a chronic dissection or degenerative atherosclerotic aneurysm. Attempts have been made to utilize only size as an indication for surgery. We have recently completed a perspective study of patients followed with serial CT scan and have identified a number of factors other than size which predict rupture. These are age, chronic obstructive lung disease and uncharacteristic pain. These three factors in addition to maximal thoracic and abdominal diameters are significant predictors of rupture. Other investigators have confirmed the importance of age and some have also found renal failure to be predictive factor for rupture. We utilize this multi variate equation to calculate rupture risk and recommend resection when the one year risk rupture exceeds the estimated operative risk. The major factors in considering operative risk are hospital mortality and paraplegia. Both of these have been reduced by multi modality approach involving distal perfusion techniques and monitoring of spinal cord function.

Surgical intervention may be divided to: 1. Emergency surgery (progressive dissection, leaking or rupture of aneurysm); 2.

Urgent procedure, due to widening of aortic aneurysm — surgery is performed during 24 hours after diagnosis; 3. Elective surgery.

Anesthetic management and monitoring

For induction and maintenance of anesthesia we used synthetic opioids, midazolam, etomidate, isoflurane and muscle relaxants. The most important principles are: prevent hypertension, maintain hemodynamic stability and prevent myocardial ischemia. For one lung ventilation we used double lumen tube (DLT) or Univent tube with utilization of fiberoptic bronchoscope. The monitoring of oxygenation, peak airway pressure, use of CPAP or PEEP during operation is same, as for any thoracotomy with one lung ventilation. Additional complication may be endobronchial bleeding due to heparinization for partial bypass. The DLT should be replaced with the single lumen endotracheal tube, after suction and inflation of both lung, when the surgical procedure is completed and patient is in supine position. Changing of DLT, after repair of descending aortic dissection can be complicated by the significant oro-facial edema, including lips, tongue, pharynx and larynx (due to several hours of lateral and head down position). In some cases, is best to leave the DLT in place, until edema will resolve. To avoid such problem, the use of Univent tube (single lumen tube with build in bronchial blocker) may be advantage. When distal perfusion is carried out with a Bio-Medicus (Bio-Medicus, Inc., Eden Prairie, Minn.), with a reservoir to allow rapid blood withdrawal and reinfusion; it is mandatory to monitor arterial pressures in right radial artery and right femoral artery to controls of the blood distribution during partial perfusion. In addition to standard monitoring for adult patients undergoing open heart surgery, from 1993 we are using monitoring of SSEPs with Cadwell Quantum 84 generator — stimulator (Cadwell Lab. Kennewick, Wash.). Continuous monitoring is initiated immediately after induction of anesthesia and its carried out until the patient is awake and can move both extremities.

Since 1993 each patient has a spinal catheter placed after operation for hourly monitoring of intrathecal pressure and for drainage of CSF if required. CSF is drained if the intrathecal pressure rises above 10 mmHg, even in the absence of any signs of spinal cord dysfunction. If any change of malfunction is noted, spinal cord perfusion pressure is optimized by draining CSF to lower intrathecal pressure and by increasing arterial pressure and SSEPs is reinstated.

Conclusion

The low incidence of permanent spinal cord injury in our most recent cohort (Group II) of patients suggests that serial sacrifice of intersegmental vessels, careful monitoring of spinal cord function are effective in preventing paraplegia after descending thoracic and thoracoabdominal aneurysm operations. Updated anesthetic and postoperative care minimized overall mortality risk.

Intraluminal stenting for patients with extremely high estimated operative risks has been successful in several centers and ongoing investigations involving improved prostheses are underway. The long-term efficacy of this approach with regard to secure long-term anchoring of the prosthesis to the aortic wall and the prevention of rupture await long-term studies.

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ODBORNÉ INFORMÁCIE

DRUHÝ EURÓPSKY KONGRES TROPICKEJ MEDICÍNY FEDERÁCIE EURÓPSKÝCH SPOLOČNOSTÍ TROPICKEJ MEDICÍNY A MEDZINÁRODNÉHO ZDRAVIA ŠTVRTÉ STRETNIUTIE KRÁLOVSKEJ SPOLOČNOSTI TROPICKEJ MEDICÍNY A HYGIENY „KLONOVANIE, TERAPIA A PREVENCIA“ LIVERPOOL, 14.–18.9.1998

2. európsky kongres tropickej medicíny sa konal v Liverpoole v Anglicku v dňoch 14.–18.9.1998 (prvý sa uskutočnil roku 1995 v Hamburgu, kde bola založená federácia európskych spoločností tropickej medicíny a medzinárodného zdravia. Federácia združuje 14 európskych štátov. Predstaviteľom Slovenskej republiky je prof. MUDr. Ondrej Bálint, CSc., prednosta Kliniky infektológie a geografickej medicíny LFUK v Bratislave. Cieľom federácie je stavať na medziodborových poznatkoch národných spoločností v Európe na základe rozvíjania európskej spolupráce a severovýchodného partnerstva pre rozvoj zdravia v trópoch rešpektujúc regionálne špecifiká.

Federácia sa zameriava najmä na harmonizáciu zdravotníckych stratégií pre rozvojové krajiny, stavy ohrozenia, celosvetovú migráciu obyvateľov, na identifikovanie priorít pre regionálnych partnerov, podporovať vznik nových zdravotnícko-vedeckých spoločností v tropických oblastiach, posilňovať harmonizáciu vzdelávania v tropickej medicíne. Ďalším cieľom je organizovať pravidelné konferencie o tropickej medicíne a zdravotníctva v Európe.

Federácia úzko spolupracuje s periodikom „Tropical Medicine and International Health“ a so sieťou Európskych škôl tropickej medicíny.

Kongres bol usporiadaný na počesť 100. výročia úspešnej výučby a výskumu liverpoolskej školy tropickej medicíny, ktorá je najstaršou postgraduálnou školou v Európe a na svete. Program kongresu bol veľmi bohatý a tvorilo ho niekoľko sekcií.

štvrté stretnutie kráľovskej spoločnosti tropickej medicíny a hygieny „klonovanie, terapia a prevencia“. Odznelo tu približne 500 prednášok a bolo prezentovaných 235 posterov. Pozornosť sa sústredovala hlavne na problematiku subtropickej a tropickej oblasti, na výskyt, liečbu a preveniu malárie. Na svete zomiera na maláriu každých 12 sekúnd jeden človek, t.j. viac ako 2 mil. ročne, 300–500 mil. je infikovaných a celkovo malária ohrozuje približne 2,4 mld. ľudí, čo je 40 % celosvetovej populácie. Veľké nádeje sa vkladajú do molekulárnej biológie a genetického inžinierstva, ktoré by mohli priniesť rozhodujúce poznatky a postupy pre radikálnejšie riešenie malárie.

Slovenskú republiku na kongrese reprezentovali prof. MUDr. O. Bálint, CSc., a RNDr. N. Jalili, CSc., s prednáškou na tému *Occurrence of malaria in five northern Afghanistan provinces between April 1991 – March 1997*. K prednáške bola bohatá diskusia.

Tretí Európsky kongres tropickej medicíny bude roku 2001 v Antverpách v Belgicku.

N. Jalili