นิพนธ์ต้นฉบับ

Surgery for acute type A aortic dissection.

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Luengtaviboon K, Sunpradit M, Kurovat Y. Surgery for acute type A aortic dissection. Chula Med J 1996 Apr;40(4): 281-287

Acute type - A aortic dissection is defined as dissection of tunica media of the aorta from the ascending aorta to the more distal part. The disease is usually without any specific physical signs. A chest X-ray may be falsely negative or show only minor abnormalities. It is life threatening due to its complication, ie. cardiac tamponade, aortic regurgitation and myocatdial infarction. Without appropriate surgery, the mortality rate is very high. We reviewed our own experiences with this operation in theChulalongkorn Hospital over a two year period. Fifteen patients were treated with one mortality. There were few complications. Our results were comparable to other reported series. We support the belief that emergency surgery for acute aortic dissection is rather safe and often times life saving procedure.

Key words : *Acute aortic dissection type-A, Surgical treatment.*

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Received for publication. January 10, 1996.

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กิตติชัย เหลืองทวีบุญ, เหมือนหมาย สรรประดิษฐ์, โยธิน คุโรวาท. การผ่าตัดรักษาภาวะเลือดเซาะในผนังหลอดเลือดแดงใหญ่ส่วนต้น. จุฬาลงกรณ์เวชสาร 2539 เมษายน:40(4): 281-287

ภาวะเลือดเซาะในผนังหลอดเลือดแดงใหญ่ส่วนต้น ทำให้ผู้ป่วยมีอาการเจ็บหน้าอกและหลังอย่างรุนแรงทันที โดยมักตรวจไม่พบความผิดปกติจากการตรวจร่างกาย ภาพถ่ายรังสีปอดอาจพบเงาของหลอดเลือดแดงใหญ่โตออกเล็กน้อย หรืออาจปกติภาวะนี้มีอันตรายอย่างสูงจากผลแทรกซ้อนได้แก่ เลือดออกในเยื่อหุ้มหัวใจกดหัวใจลิ้นหัวใจแออร์ติกรั่วเฉียบพลัน หรือการอุดตันรูเปิดโคโรนารี่เกิดกล้ามเนื้อหัวใจตายจากการขาดเลือดอย่างเฉียบพลัน การรักษาทางยามีอัตราตายสูงมาก การผ่าตัดจะลดอัตราตายลงได้ เสนอการรักษาผู้ป่วยในโรงพยาบาลจุฬาลงกรณ์ ในระยะเวลา 2 ปี มีผู้ป่วย 15 ราย เสียชีวิตหลังการผ่าตัด 1 ราย เนื่องจากมีกล้ามเนื้อหัวใจตายก่อนการผ่าตัด ผลแทรกซ้อนอื่นพบได้ไม่มาก บทความรายงานนี้สนับสนุนการผ่าตัดฉุกเฉินสำหรับผู้ป่วยประเภทนี้

Acute type - A aortic dissection is not uncommon in Thailand. It is quite difficult to diagnose without a high index of suspicion. A CT scan is helpful to make the diagnosis. An aortogram is no longer necessary. The echocardiogram is becoming a standard diagnostic tool, espectially to visualize aortic valve involvement, cardiac tamponade, and abnormal left ventricular contraction.. The rate of early mortality without surgery is excessively high. The most frequent causes of deaths are aortic regurgitation with heart failure, cardiac tamponade due to rupture of false lumen, and coronary occlusion with myocardial infarction. Prompt medical treatment with sodium nitroprusside and beta blocker to control the blood pressure and heart rate are important to prepare the patient for surgery. Emergency surgery following correct diagnosis dramatically improves the survival rate. In the operation the ascending aorta is replaced,the false lumen is obliterated, and the aorta valve is resyuspended. With recent developments in surgical technique and grafts, the hospital mortality rate is now in the 5-10 % range.

Subjects and Methods

From October 1992 to December 1994,15 patients were operated on in our unit acute type - A aortic dissection. There were 7 male and 8 female patients. Their ages ranged from 29 to 82 years with a mean of 60.3 years old. A history of severe acute chest or back pain was an important clue for further investigation. A chest X-ray sometimes shows a mild widening of the mediastinum. A CT scan of the chest usually demonstrates a flap in the aorta which divides it into a true and a false lumina. An echocardiogram is important to evaluate the presence and severity of aortic valve regurgitation, fluid in the pericardial space, signs of cardiac tamponade and evidence of a regional wall motion abnormality of the ventricle which may suggest underlying coronary stenosis or dissection of the coronary ostium. Ten patients had history of hypertension. Most of them were inadequately controlled. The duration from onset of chest pain to admission varied from 1 to 1 4 days. Ten patients had echocardiographic evidence of hemopericardium, one had cardiac tamponade. Two and ECG evidence of myocardial ischemia with one patient had frank anterior wall myocardial infarction. Four patients had significant aortic regurgitation. One patient had Marfans syndrome.

Operative technique.

The operation is done on an emergency basis. The patient is laid in the supine position. Both groins are preped. A median sternotomy is the standard incision. Cannulation of superior and inferior venae cavae and femoral artery is done after systemicheparinization. Cardiopulmonary bypass with moderat systemic hypothermia is performed. Cold crystalloid is infused directly into coronary ostia for the first dose followed by infusion into coronary sinus in subsequent doses (retrograde cardioplegia).

The ascendingaorta is opeeened longitui-dinally , and part of it is excised. The clot is remove

from the false lumen if it is present. The proximal transection is usually just downstream to the aortic commissures. The commissures are resuspended if they are dissected from the aortic wall. Two strips of teflon are placed insidethe lumen and outside the adventitia. They are sutured to the aorta with continuous mattress of polypropylene. The distal stump is done in the same way. An appropriate length of zero prosity dacron graft is sutured to the proximal and distal stumps.

Standard operation was performed in13 patients. Bentall's operation was performed in two patients-one with Marfans syndrome and anuloaortic ectasia and one with bleeding from false lumen in sinus of Valsalva.

Postoperative care emphasises strict control of arterial hypertension with sodium nitroprusside and propanolol. Otherwise it is the same as in ordinary open cardiac patient.

Results

Significant complications included the following:

1. excessive bleeding requiring reoperation in 2 patients
2. sternal dehiscence and infection in 1 patient
3. cerebrovascular accident in 1 patient at 3 weeks postoperatively.
4. residual aortic regurgitation in 2 patients

Postoperative bleeding happened in early two cases in this series. With more experience, this problem is completely eliminated. There was one hospital mortality. She was a 57 years old women who also had acute anteroseptal myocardial infarction and paraplegia for 8 hours before surgery. The cause of death was intractable ventricular fibrillation on the second postoperative day. All the survived patients are followed. There is no late death. The AR does not progress. There is no reoperation for any causes in our patients.

Discussion

Acute aortic dissection is one of the mor life threatening cardiovascular conditions. The onset is sudden and causes very severe pain. However, the diagnosis is not easy unless the physician has a high index of suspicion of aortic dissection. Type - A is lethal so surgery is always recomended unless the patient is moribund or has severe neurological damage. A CT scan makes diagnosis straight forward in most cases. In doubtful cases, and when cardiac information is required, an echocardiogram is useful. Transesophageal echocardiogram is superior to transthoracic due to its closeness to the aorta, with the exception of the aortic arch anteriorly. Aortogram, which previously was the gold standard for diagnosis, is now frequently omitted. Medical treatment with antihypertensives useally sodium nitroprusside and a betablocker, is crucial to maintain the patient in the best condition prior to surgery. Acute type-A dissection is itself the indication for emergency surgery. The mortality rate without surgery is near 50 % at 48 hours after onset of the severe chest pain.[1] "Operative mortality is now lower due to more rapid diagnosis and sooner surgery, and also improved surgical techniques and graft materials. From our earlier experiences, the most common

causes of perioperative death were surgical bleeding due to friability of the aortic wall.[2] Use of double layers of teflon strips to reinforce both the proximal and distal aortic ends markedly decreased bleeding. The use of zero porosity dacron grafts has also lowered bleeding from graft interstices. The preclotting process previously required usually made grafts and difficult to put stitches through. Total transections of the aorta also make for more secure suture lines. The open technique of anastomosis has completely replaced the inclusion technique.[3] Some surgeons avoided clamping the aorta and employed total circulatory arrest and profound hypothermia to perform distal anastomosis.[4] They believed that the aorta clamp itself may have created new intinal tears. We did not have problems with clamping the aorta but we tried try to do it as atraumatically as possible. We also reinforced the distal suture line with a large strip of teflon circumferentially. Resuspension is effective for improving AR.[5] The mechanism of AR in such conditions is detachment of commissures from outer the aortic wall and prolapse of leaflets into the left ventricular outflow tract.[6] Usually some residual regurgitation is well tolerated and, infrequently,valvular replacement is necessary.[7] Late reoperation is rarely due to progressive AR. If the patient has Marfans syndrome, or the sinus of Valsalva is sseverely damaged from the dissecting process, a modified Bentalls operation is required.[8] Coronary arterial involvement can be fatal. Perioperative myocardial infarction may result in a low output syndrome and death. Usually it involves the right coronary ostium only, and obliteration of the false lumen by the described technique reverses myocardial ischemia as shown in our patients. But dissection into more distal coronaries beyond the ostia is difficult to treat and the outcome is very poor. Coronary arterial bypasses are the only avialable treatment, but perioperative myocardial infarction happens frequently.[9] There is controversy about when the aortic arch should be replaced. Most authors believe that in most acute type - A dissections,only replacement of the ascending aorta is adequate to prevent dreadful complications.[10] The arch should be replaced only when intimal tear is in the arch itself.[11] This happens in about 10 % of cases.[12] The other indication is a very dilated arch which is prone to rupture or has ruptured. The morbidity and mortality of arch replacement is high.Therefore, some authors believed that even when ascending aortic resection did not include an intinal tear, the procedure was still adequate for most acute type - A dissection. Failure to include the area of the intimal tear has not been,, with any certainty, a risk factor for death early or late after repair.[13] We never resected the aortic arch but we did have a rupture of arch false lumen in one patient after very high arterial blood pressure in the early postoperative period after CPR and intravenous adrenalin. After external reinforcement with teflon strip the incidence did not reoccur. Good perioperative blood pressure control is indispensable in such patients. The distal false lumen usually persists after proximal repair.[14] Aneurysms of the false channel developed in about 50 % of the patients who have uncontrolled arterial

hypertension, but in only 10-20 % of those whose blood pressure is well controlled.[15] Thus the operation for acute dissection is usually not curative, unless the dissection involves only the portion of the aorta included in the resection. This occurs only the portion of the aorta included in the resection;this occurs only in dissections limited to the ascending aorta (DeBakey type 2).

Conclusion

Acute type - A aortic dissection is a surgical condition which also requires good medical treatment. The surgery is relatively safe and can definitely prolong the patients life. However, life - long careful follow - up and good compliance for medical treatmentsare major determinants of the final outcome.

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