

# SURGERY OF ASCENDING AORTIC DISSECTION, A SIX YEARS EXPERIENCE

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**Abstract** - Acute dissection of the ascending aorta requires immediate surgical intervention. Without surgical treatment 1% of the patients will die every hour. In this study we report the result of operations on patients with Stanford type A aortic dissection. From 1997 to 2003, 26 patients (16 males, 10 females) aged 30 to 71 years (mean age  $48.9 \pm 2.3$  years) underwent surgical treatment. In all of them ascending aorta was replaced and in 16 patients aortic valve was also replaced with prosthetic valve. In 3 patients the aortic valve was repaired, in 7 patients valve was normal. Hospital mortality amounted to 23.07% (6 patients). Only 13 patients could be followed and the rest of the patients did not return for follow up. During this period of time no patient had to be reoperated upon for late complications of the disease and none of these patients died in the follow up. Presence of Marfan's syndrome, renal failure, stroke, cardiac failure, and reoperation were determinant risk factors for mortality. With early diagnosis and surgical treatment about 77% of these patients survived postoperatively.

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**Key words:** Aortic dissection, aneurysm, valve

## INTRODUCTION

Dissection of the aorta is a life threatening disease and without effective treatment most of the patients will die because of sudden rupture or pericardial tamponade; some patients die even before diagnosis can be made. As many as 30% of patients ultimately diagnosed as having aortic dissection are first thought to have another disease, showing necessity of a high level of suspicion to make correct diagnosis.

Arterial hypertension is a major risk factor for aortic dissection and can be found in 80% of the patients. Aortic dissection is most common in the fifth through the seven decades of life and men are affected at least twice as commonly as women (1). False lumen may cause obstruction of vessels arising from the aorta and impair blood flow to the organ supplied with that vessel. In acute Stanford type A

dissection, central and peripheral neurological abnormalities may be seen in up to 40% of the patients. Stroke is seen in 5% of patients with type A dissection. Restoration of the blood flow rarely improves stroke and may even cause hemorrhage and brain death; yet surgery must be done. In this study we report the result of operations on our patients with Stanford type A aortic dissection.

## MATERIALS AND METHODS

In this study, performed from 1997 to 2003 in Madani Heart Center, Tabriz University of Medical Sciences, 26 patients undergoing surgical repair of aortic dissection were evaluated. Among our patients, 88% had severe pain on admission, 3 patients had syncope and 3 patients had central nervous system (CNS) involvement. The mean age of the patients was  $48.9 \pm 2.3$ ; there were 10 women and 16 men. Two patients had Marfan's syndrome.

Most of the patients were diagnosed by echocardiography or angiography and the final decision for the type of operation (valve sparing or replacement) was made by the surgeon

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## Surgery of aortic dissection

intraoperatively and did not depend on the presence of aortic insufficiency before the operation.

Patients underwent surgery with femoral cannulation and cardiopulmonary bypass, and only in 2 patients with arch involvement total circulatory arrest was done. In all of them ascending aorta was replaced with Dacron tube. Replacement of aortic valve with mechanical valve was applied in 16 patients (61.5%) and 3 patients (11.5%) were operated with a valve preserving implantation. The valve function was controlled with transesophageal echocardiography during the operation, which showed no aortic insufficiency with valve repair.

## RESULTS

According to the kind of aortic involvement, we performed different types of operations in our patients. In 3 cases (11.5%) ascending aorta and arch were replaced, in 4 cases (15.3%) only ascending aorta was replaced, in 16 cases (61.5%) ascending aorta and valve replacement was performed and in 3 cases (11.5%) ascending aorta with valve repair was done (Table 1). In both patients with Marfan's syndrome valve and ascending aorta were replaced.

Hospital mortality amounted to 23.07% (6 patients). Causes of early mortality are shown in table 2. During the operation, 1 patient died because of heart failure, and another patient died because of uncontrolled bleeding. After the operation 1 patient had postoperative bleeding in intensive care unit (ICU) who was operated upon again for control of bleeding which was not successful and patient died; 2 patients died with multiorgan failure, 1 patient developed stroke and finally died in ICU. Patients with syncope, CNS involvement, ruptured aneurysm and renal failure before the operation and respiratory failure after it had a higher mortality rate. There were no sex differences in mortality.

**Table 1.** Type of operation in patients under study

Operation	No of patients (%)
Ascending aorta and arch	3 (11.5)
Ascending aorta only	4 (15.3)
Ascending and valve replacement	16 (61.5)
Ascending and valve repair	3 (11.5)

**Table 2.** Causes of early mortality

Complication	No of patients
Left ventricular pump failure	1 (3.84%)
Hemorrhage	2 (7.69%)
Multiorgan failure	2 (7.69%)
Stroke	1 (3.84%)

We could follow only 13 patients. There were no death; only 1 patient developed endocarditis after discharge which responded to medical treatment. The false lumen showed complete thrombosis within 3 months postoperatively.

## DISCUSSION

Dissecting aortic aneurysm is a life threatening disease and as many as 40% of the patients suffering from acute dissection die immediately. Those surviving the initial event must be stabilized with medical management and then undergo surgical intervention. Without appropriate treatment most patients will not survive and after 1 month only 8% are alive (2). Severe pain was the most common symptom in our patients and diagnosis of the disease was made with echocardiography. Nowadays, spiral computed tomography (CT) scan is the best method for diagnosis of acute dissection that can diagnose the disease in about 15 minutes. Magnetic resonance imaging (MRI) shows better images but takes more time. Aneurysm of false channels develops in about 50% of the patients who have uncontrolled arterial hypertension but in only 10% to 20% of those whose blood pressure is well controlled. Operation for acute dissection is not curative unless the dissection involves only the portion of the aorta included in the resection (3). Aortic dissection in pregnancy is a life threatening event in women under 40 years of age and is mostly seen in patients with bicuspid aortic valve or Marfan syndrome (4). In cases with acute type A dissection before 30 weeks of gestation, Cesarean section followed by cardiac surgery is the best modality of treatment (5). In patient with Marfan syndrome, aneurysm of the ascending aorta must be operated earlier when the diameter of the aorta is above 5.5 cm before rupture or dissection

take place (6). After valve replacement, anticoagulation must be used postoperatively which has disadvantages such as: 1) postoperative bleeding will be increased, 2) false lumen could not be occluded with thrombosis which leads to aneurysm formation, 3) most of the patients are old and are at risk of intracranial hemorrhage and 4) all patients could not be followed (in our series only 50% were followed). Considering good results of the repair of the valve in our patients and in other centers, it is better to repair the aortic valve whenever it is possible and cusps are normal. In study of Kallenbach *et al.*, 19 patients underwent valve repair and ascending aorta replacement. In 16 patients (84%) there was no aortic insufficiency (AI) and in 3 patients (16%) grade one AI was seen postoperatively. No patient required valve replacement at follow up (7).

Formerly, postoperative bleeding was the most frequent cause of death in patients. Nowadays with the use of glue and double patch sandwich technique, using glutaraldehyde and fixation of pericardium at the anastomotic site, bleeding is not a frequent complication (8). Mortality was more common in patients with renal failure, prolonged pump time and aortic cross clamp time.

In some patients ascending aortic dissection may involve the arch and descending aorta. Less experienced surgeon who would hesitate to replace the total arch can replace the ascending aorta and repair the intimal tear locally. Full thickness of aorta must be incorporated in the suture line (9, 10). In our patients with arch involvement, only the ascending aorta was replaced and there was no complication in the follow up of these patients.

In the follow up of the patients we could follow only 13 patients. The false lumen showed complete thrombosis within 3 months postoperatively. There was no death; only 1 patient developed endocarditis after discharge which responded to medical treatment.

In conclusion, we recommend that because aortic valve cusps were normal in most of the patients with aortic dissection and inadequate follow up for anticoagulation therapy in our patients we recommend aortic valve repair instead of replacement whenever possible.

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