

## Contents

Background Information on Treatment.....	2
Sample Studies Looking at Surgical Outcomes in Elderly People With A Type A Aortic Dissection .....	4
#1) Early and late surgical outcomes of acute type A aortic dissection in patients aged 75 years and older.....	4
#2) Operation for acute type A aortic dissection in octogenarians: is it justified?.....	5
#3) Is advanced age a contraindication for emergent repair of acute type A aortic dissection? .....	6
#4) Clinical presentation is the main predictor of in-hospital death for patients with acute type A aortic dissection admitted for surgical treatment: a 25 years experience. ....	7
#5) Role of age in acute type A aortic dissection outcome: report from the International Registry of Acute Aortic Dissection (IRAD). ....	8
#6) Surgery for acute type A aortic dissection: is advanced age a contraindication? .....	9
Overall Conclusions .....	11

## Background Information on Treatment

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1861401/>

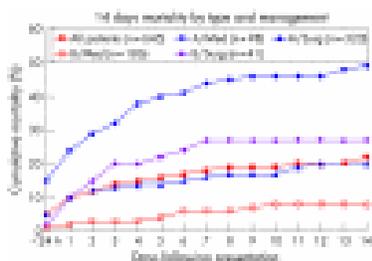
### THERAPEUTIC APPROACH

Acute dissections involving the ascending aorta are considered surgical emergencies requiring swift repair of the aortic root or reconstruction of the ascending aorta and the arch to improve prognosis. In contrast, dissections confined to the descending aorta are treated medically unless progression of dissection, intractable pain, organ malperfusion, or extra-aortic blood is demonstrated.

In the initial phase after impact the therapeutic objective is normalisation of blood pressure and lowering of the left ventricular ejection force ( $dp/dt$ ), with  $\beta$ -blockers, to the lowest tolerable levels while ensuring adequate cerebral, coronary, and renal perfusion. For most patients, a blood pressure between 100–120 mm Hg at a heart rate  $<60$  beats/min is achievable. In patients intolerant to  $\beta$ -blockers because of asthma, bradycardia, or signs of heart failure, vasodilators and short acting calcium channel blockers are valuable options. In patients with low and even normal blood pressure at presentation, possible volume depletion from haemorrhage and/or pericardial effusion must be considered. These patients may benefit from intubation before rapid tomographic imaging for confirmatory diagnosis and swift treatment. If pericardial tamponade is diagnosed, pericardiocentesis before surgery can be harmful because it may counteract hypotonic haemostasis and eventually cause more pericardial bleeding and intractable tamponade.<sup>16</sup>

### PROXIMAL (TYPE A) AORTIC DISSECTION

Acute proximal dissection (Stanford type A or DeBakey type I or II) are to be considered a surgical emergency because of the high risk of life-threatening complications (fig 11).). Medical management alone has a mortality of nearly 20% by 24 h and 30% by 48 h (fig 22).). Surgical treatment aims to prevent lethal complications such as aortic rupture, stroke, visceral ischaemia, cardiac tamponade, and circulatory failure. With a history of 50 years the surgical concept is to excise the intimal tear to close any entry to the false lumen, and to reconstruct the aorta with interposition of a synthetic graft with or without reimplantation of coronary arteries.<sup>17</sup> In addition, restoration of aortic valve competence is needed with aortic insufficiency by resuspension of the native aortic valve or valve replacement (table 22).<sup>18</sup>



**Figure 2** Fourteen-day mortality in 645 patients from the International Registry of Aortic Dissection (IRAD) registry stratified by medical and surgical treatment in both type A and B aortic dissection. Adapted from Hagan *et al.*<sup>1</sup>

Recommendation*	Class
Emergency surgery to avoid tamponade/aortic rupture	I
Valve preserving surgery, tubular graft if normal sized aortic root and no pathological changes in valve cusps	I
Replacement of aorta and aortic valve (composite graft) if ectatic proximal aorta and/or pathological changes of valve/aortic wall	I
Valve-sparing operations with aortic root remodeling for abnormal valves	IIa
Valve preservation and aortic root remodeling in Marfan patients	IIa

\*All recommendations are level of evidence C.  
Adapted from Nienaber and Eagle<sup>1</sup>

## Table 2 Surgical treatment of acute type A (type I and II) aortic dissection

With an operative mortality of 15% to 35%, surgery has a clear prognostic advantage over medical treatment.<sup>19,20,21,22,23</sup> Adjunctive measures such as profound hypothermic circulatory arrest and selective retrograde perfusion of the head vessels have improved outcomes of proximal and arch repair.<sup>24</sup> Hypothermic circulatory arrest and retrograde perfusion have yielded mean (SD) survival rates at three and five years of 75 (5)% and 73 (6)%. Although definitive treatment of acute type A aortic dissections requires surgery, not more than 80% of patients in IRAD underwent surgery; this was because of co-morbid conditions, old age (>80 years), patient refusal, or a combination of these factors.

## **Sample Studies Looking at Surgical Outcomes in Elderly People With A Type A Aortic Dissection**

These six sample studies are simply the ones I came across in an internet search in a certain period of time. They are not selected in any way in terms of their conclusions.

### **#1) Early and late surgical outcomes of acute type A aortic dissection in patients aged 75 years and older.**

#### **Send to:**

[Ann Thorac Surg.](#) 2000 Nov;70(5):1455-9.

[Kawahito K<sup>1</sup>](#), [Adachi H](#), [Yamaguchi A](#), [Ino T](#).

#### **Author information**

### **Abstract**

#### **BACKGROUND:**

With the general increase in human lifespan, aortic surgeons are faced with an increasing prevalence of acute type A aortic dissection in the elderly. In this study, we reviewed early and late surgical outcomes of acute type A dissection (operation within 48 hours after onset) in patients aged 75 years and older.

#### **METHODS:**

Between 1990 and 1999, 109 patients underwent emergency operation for acute type A dissection at Omiya Medical Center. Twenty-three patients were aged 75 years and older (elderly group, mean age, 79.1 +/- 4.7 years) and 86 were younger than 75 years old (younger group, mean age, 58.7 +/- 10.8 years). Early and late outcomes of both groups were compared.

#### **RESULTS:**

The hospital mortality rates were 13.0% (3 of 23) in the elderly group and 10.5% (9 of 86) in the younger group ( $p = 0.71$ ). In the elderly, actuarial survival rate (including the operative mortality rate) at 1, 3, and 5 years was 78% +/- 9% for each point. In the younger group, the rates were 88% +/- 4% at 1 year, 83% +/- 4% at 3 years, and 81% +/- 5% at 5 years ( $p = 0.57$ ). Actuarial event-free rates were 84% +/- 8% at 1 year, 77% +/- 11% at 3 years, and 77% +/- 11% at 5 years in the elderly group. In the younger group, the rates were 96% +/- 2% at 1 year, 88% +/- 4% at 3 years, and 81% +/- 7% at 5 years ( $p = 0.27$ ).

## CONCLUSIONS:

No significant differences in the hospital mortality, actuarial survival, or event-free rates were observed between the two groups. Operation for type A acute aortic dissection in patients aged 75 years or older can be performed with acceptable risk of death, and long-term results are satisfactory.

- [Abstract](#)

### [Send to:](#)

[J Thorac Cardiovasc Surg.](#) 2001 Feb;121(2):259-67.

## #2) Operation for acute type A aortic dissection in octogenarians: is it justified?

[Neri E<sup>1</sup>](#), [Toscano T](#), [Masseti M](#), [Capannini G](#), [Carone E](#), [Tucci E](#), [Diciolla F](#), [Scolletta S](#), [Morello R](#), [Sassi C](#).

### [Author information](#)

## Abstract

### BACKGROUND:

With the progressive aging of Western populations, cardiac surgeons are faced with treating an increasing number of elderly patients. Controversy exists as to whether the expenditure of health care resources on the growing elderly populations represents a cost-effective approach to resource management. The potential to avoid surgery in patients with little chance of survival and poor quality of life would spare unnecessary suffering, reduce operative mortality, and enhance the use of scarce resources.

### METHODS:

We reviewed the records of 24 consecutive patients aged 80 years or older (mean age 83 years, range 80-93 years) who underwent operations for acute type A dissection from 1985 through 1999. No patient with acute type A dissection was refused surgery because of age or concomitant disease. Seventeen patients were men. Preoperatively, none of the patients was moribund, although 66% had hemodynamic instability and 41% experienced cerebral ischemia. All patients had one or more associated pathologic conditions. Hospital mortality and morbidity models, based on our overall experience with 197 patients operated on for acute type A aortic dissection during the period of the study, were developed by means of multivariate logistic regression with preoperative and intraoperative variables used as independent predictors of outcome.

### RESULTS:

Overall hospital mortality was 83%. Intraoperative mortality was 33%. All patients who survived the operation had one or more postoperative complications. Mean hospital stay was 37 days with

a total of 314 days in the intensive care unit (average 19 days, median 17 days). None of the survivors (4 patients) discharged from the hospital was able to function independently and their survival at 6 months was 0%. Statistical analysis of the overall experience with operations for type A acute aortic dissection confirmed that age in excess of 80 years is the most important independent patient risk factor associated with 30-day mortality and morbidity.

## CONCLUSIONS:

Operations for acute type A dissection performed on octogenarians involve increased hospital mortality and morbidity. Short-term survival is unfavorable and is associated with a poor quality of life. Without additional corroborative studies to endorse the present findings, the use of age as a parameter to limit access of patients to expensive medical resources remains an unsubstantiated concept. In the context of acute type A aortic dissection, however, the hypothesis that older patients should be denied such a complicated surgical intervention to conserve resources is supported by the presented data.

- [Abstract](#)

## [Send to:](#)

[Interact Cardiovasc Thorac Surg.](#) 2010 Apr;10(4):539-44. doi: 10.1510/icvts.2009.222984. Epub 2010 Jan 21.

## **#3) Is advanced age a contraindication for emergent repair of acute type A aortic dissection?**

[Stamou SC](#)<sup>1</sup>, [Hagberg RC](#), [Khabbaz KR](#), [Stiegel MR](#), [Reames MK](#), [Skipper E](#), [Nussbaum M](#), [Lobdell KW](#).

## [Author information](#)

## Abstract

With the general increase in human lifespan, cardiac surgeons are faced with treating an increasing number of elderly patients. The aim of our study was to investigate whether advanced age poses an increased risk for major morbidity and mortality with repair of acute type A aortic dissection. Between 2000 and 2008, 119 patients underwent emergency operation for acute type A aortic dissection at two institutions; 90 were younger than 70 years of age and 29 patients were 70 years or older. Major morbidity, operative and 5-year actuarial survival were compared between groups. The operative mortality rates were comparable between the two groups (18.9% in patients <70 years vs. 24.1% for patients ≥70 years, P=0.6). There was no difference in the rates of reoperation for bleeding (<70 years 31.7% vs. 14.3% for ≥70 years, P=0.09), stroke (18.9% for those <70 years vs. 20.7% for those ≥70 years, P=0.79), acute renal failure (22.2% for those <70 years vs. 17.2% for those ≥70 years, P=0.79) or prolonged ventilation (34.4% for those <70 years vs. 24.1% for those ≥70 years, P=0.36) between the two groups. Actuarial 5-year survival rates were 77% for patients <70 years vs. 59% for patients ≥70 years (P=0.07). The mortality for patients who presented with hemodynamic instability was

markedly higher (10 out of 14 patients, 71.4%) compared with the mortality of those who presented with stable hemodynamics (21 out of 88 patients, 23.9%,  $P < 0.001$ ), regardless of age group. No significant differences in operative mortality, major morbidity and actuarial 5-year survival were observed between patients  $\geq 70$  years and younger patients although there was a trend toward a lower actuarial 5-year survival in older patients. **Surgery for type A acute aortic dissection in patients 70 years or older can be performed with acceptable outcomes. Hemodynamic instability portends a poor prognosis, regardless of age.**

#### **#4) Clinical presentation is the main predictor of in-hospital death for patients with acute type A aortic dissection admitted for surgical treatment: a 25 years experience.**

[Santini F<sup>1</sup>](#), [Montalbano G](#), [Casali G](#), [Messina A](#), [Iafrancesco M](#), [Luciani GB](#), [Rossi A](#), [Mazzucco A](#).

#### **Author information**

#### **Abstract**

#### **BACKGROUND:**

This retrospective analysis assessed the hypothesis that clinical status on admission more than other variables related to surgical or post-operative management may influence in-hospital mortality after surgical treatment of acute type A aortic dissection.

#### **METHODS:**

Between January 1979 and April 2004, 311 patients, mean age of  $59.5 \pm 13$  years (range, 18 to 88 years), with acute type A aortic dissection were referred for surgery. Logistic regression analysis was applied to demographics, etiological, clinical, and surgical variables, to identify independent predictors of in hospital death.

#### **RESULTS:**

In hospital mortality rate was 23%. Univariate analysis showed older age ( $p=0.03$ , OR 1.02/yr), cardiac tamponade ( $p=0.001$ ; OR 2.43), hypotension ( $p=0.0001$ ; OR 8), myocardial ischemia ( $p=0.005$ ; OR 7), acute renal failure ( $p=0.0001$ ; OR 4.16), limb ischemia ( $p=0.0002$ ; OR 3.3), neurological deficits pre-op ( $p=0.0001$ ; OR 8.5), and mesenteric ischemia ( $p=0.003$ ) as independent predictors of in-hospital death. **Multivariate analysis identified the following presenting variables as predictors of in-hospital death: hypotension ( $p=0.003$ ; OR 7.4), myocardial ischemia ( $p=0.03$ ; OR 5.8), mesenteric ischemia ( $p=0.009$ ), acute renal failure ( $p=0.0001$ ; OR 3.9), neurological deficits ( $p=0.0001$ ; OR 7.7).** In-hospital mortality for the group of patients presenting with at least one of the tested pre-operative complications ( $N=158$ ; 51%) was 33% vs 12% ( $p=0.0001$ ). **No other variables emerged as significant for in-hospital death.**

## CONCLUSION:

In an era of standardized surgical technique, expeditious referral and intervention by lowering preoperative dissection-related complications and co-morbidities might represent the most efficacious tool to improve results.

### Send to:

[J Thorac Cardiovasc Surg](#). 2010 Oct;140(4):784-9. doi: 10.1016/j.jtcvs.2009.11.014. Epub 2010 Feb 21.

## #5) Role of age in acute type A aortic dissection outcome: report from the International Registry of Acute Aortic Dissection (IRAD).

[Trimarchi S<sup>1</sup>](#), [Eagle KA](#), [Nienaber CA](#), [Rampoldi V](#), [Jonker FH](#), [De Vincentiis C](#), [Frigiola A](#), [Menicanti L](#), [Tsai T](#), [Froehlich J](#), [Evangelista A](#), [Montgomery D](#), [Bossone E](#), [Cooper JV](#), [Li J](#), [Deeb MG](#), [Meinhardt G](#), [Sundt TM](#), [Isselbacher EM](#); [International Registry of Acute Aortic Dissection Investigators](#).

### Collaborators (31)

### Author information

## Abstract

### OBJECTIVE:

The increasing life expectancy of the population will likely be accompanied by a rise in the incidence of acute type A aortic dissection. However, because of an increased risk of cardiac surgery in an elderly population, it is important to define when, if at all, the risks of aortic repair outweigh the risk of death from unoperated type A aortic dissection.

### METHODS:

We analyzed 936 patients with type A aortic dissection enrolled in the International Registry of Acute Aortic Dissection from 1996 to 2004. Patients with type A aortic dissection were categorized according to patient age by decade and by surgical versus medical management, and outcomes of both management types were investigated in the different age groups.

### RESULTS:

The rate of surgical aortic repair decreased progressively with age, whereas surgical mortality significantly increased with age. Age 70 years or more was an independent predictor for mortality (38.2% vs 26.0%;  $P < .0001$ , odds ratio 1.73). The in-hospital mortality rate was significantly lower after surgical management compared with medical management until the age

of 80 years. For patients aged 80 to 90 years, the in-hospital mortality appeared to be lower after surgical management (37.9% vs 55.2%; P = .188); however, this failed to reach clinical significance owing to the limited patient number in this age group.

## CONCLUSIONS:

Although the surgical mortality significantly increased with increased age, surgical management was still associated with significantly lower in-hospital mortality rates compared with medical management until the age of 80 years. Surgery may decrease the in-hospital mortality rate for octogenarians with type A aortic dissection and might be considered in all patients with type A aortic dissection regardless of age.

- [Abstract](#)

## [Send to:](#)

[Ann Thorac Surg.](#) 2004 Aug;78(2):585-90.

## **#6) Surgery for acute type A aortic dissection: is advanced age a contraindication?**

[Chiappini B<sup>1</sup>](#), [Tan ME](#), [Morshuis W](#), [Kelder H](#), [Dossche K](#), [Schepens M](#).

## [Author information](#)

## **Abstract**

## **BACKGROUND:**

With the general increase in human lifespan, cardiac surgeons are faced with treating an increasing number of elderly patients. The purpose of this study was to demonstrate early and late results of surgery for aortic dissection in patients older than 70 years of age compared with those younger than 70 years and to clarify the clinical problems related to this subset of patients.

## **METHODS:**

Between 1976 and 2001, 315 patients underwent emergency operation for acute type A dissection: 245 were younger than 70 years (group 1) and 70 patients were 70 years of age and older (group 2). Early and late outcomes of both groups were compared.

## **RESULTS:**

The hospital mortality rates were 20.5% in group 1 and 17.6% in group 2 (p = 0.751). The mean extracorporeal circulation time was 192.6 +/- 65.2 minutes and 185.7 +/- 58.4 minutes in groups

1 and 2, respectively ( $p = 0.42$ ). The mean cross-clamp time was  $116.3 \pm 45.8$  minutes and  $100 \pm 36.7$  minutes in groups 1 and 2, respectively ( $p = 0.009$ ). Actuarial survival rates were 77.1% after a mean follow-up time of  $259 \pm 9$  months for patients of group 1 and 80% after  $77 \pm 5$  months for patients of group 2, without any statistically significant difference ( $p = 0.619$ ).

#### **CONCLUSIONS:**

No significant differences were observed in the 30-day mortality and actuarial survival between the two groups. Therefore we believe that surgery for type A acute aortic dissection in patients 70 years of age or older can be performed with acceptable risk of death and satisfactory results.

## Overall Conclusions

- 1) Generally, surgical intervention is of benefit compared to medical management of the condition (there is lower mortality and a better long-term prognosis).
- 2) Five out of six studies support surgical intervention in the elderly, including all of the largest studies. They have conclusions like that of study #6 (“No significant differences were observed in the 30-day mortality and actuarial survival between the two groups [older vs younger, following surgical intervention]. Therefore we believe that surgery for type A acute aortic dissection in patients 70 years of age or older can be performed with acceptable risk of death and satisfactory results”). Or that of study #3, which concludes: “Surgery for type A acute aortic dissection in patients 70 years or older can be performed with acceptable outcomes. Hemodynamic instability portends a poor prognosis, regardless of age”.
- 3) One of the six studies, study #2, comes to the opposite conclusion, namely that: “Operations for acute type A dissection performed on octogenarians involve increased hospital mortality and morbidity. Short-term survival is unfavorable and is associated with a poor quality of life.....In the context of acute type A aortic dissection... the hypothesis that older patients should be denied such a complicated surgical intervention to conserve resources is supported by the presented data.”

This small study (24 patients) does not compare the outcomes to those of younger people, it only looks at a group of elderly people in particularly bad shape (“... 66% had hemodynamic instability and 41% experienced cerebral ischemia. All patients had one or more associated pathologic conditions..”). It then comes to the conclusion that they did very poorly, expanding the conclusions as though they applied to all octogenarians. It looks to me almost as though the patients in this study were pre-selected to allow the authors to reach a desired conclusion. Based on the fact that this study is framed from beginning to end in terms of saving resources, it looks as though it was done with the explicit purpose of providing justification for the denial of the procedure to elderly people, rather than being done from a purely medical perspective.