International Journal of Cardiology 115 (2007) 305–311

International Journal of Cardiology

www.elsevier.com/locate/ijcard

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

Francesco Santini *, Giuseppe Montalbano, Gianluca Casali, Antonio Messina, Mauro Iafrancesco, Giovanni Battista Luciani, Andrea Rossi, Alessandro Mazzucco

Division of Cardiac Surgery, University of Verona, OCM Borgo Trento, Piazzale Stefani 1, 37126 Verona, Italy

Received 7 October 2005; received in revised form 2 March 2006; accepted 11 March 2006
Available online 4 August 2006

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±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 ($p=0.03$, OR1.02/yrs), 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% ($p=00001$). 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.

Keywords: Aorta; Mortality; Surgery; Risk factors

1. Introduction

Acute type A aortic dissection is a life-threatening emergency that carries a high mortality rate without surgical treatment [1]. Surgery requires resection of the entry site of the dissection, usually located above the valvular commissures, to exclude the fragile false lumen from high pressure blood flow. Aortic root and/or valve as well as the aortic arch may also require treatment in selected cases [2].

Despite improvement in surgical techniques and post-operative management achieved worldwide over the last 10 years, reported in-hospital mortality varies sometimes substantially among centers and often within the same center over time [3–6].

In an attempt to clarify this issue, this retrospective analysis assessed the hypothesis that clinical status on admission more than other variables related to surgical or post-operative intensive care management may influence in-hospital mortality. Aim of this study was also to generate a scoring system with the purpose to predict in-hospital death for patient admitted with acute type A aortic dissection and referred for surgery, and to compare treated population among centers.

* Corresponding author. Tel.: +39 45 8072476; fax: 39 45 8073308.
E-mail address: fsant@yahoo.com (F. Santini).

0167-5273/$ - see front matter © 2006 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ijcard.2006.03.013

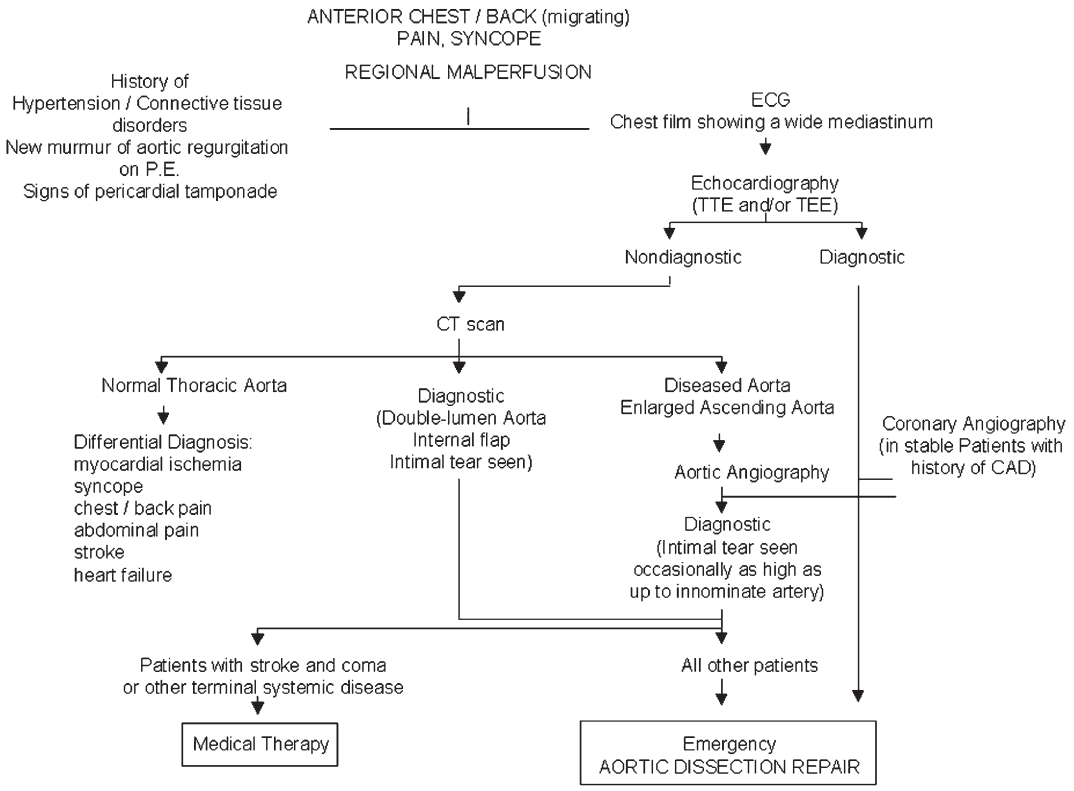

Fig. 1. Decision making process in type A aortic dissection. PE = physical examination. CAD = coronary artery disease.

The study was conducted in a tertiary university hospital with 25 years experience in aortic dissection.

2. Materials and methods

Between January 1979 and April 2004, 311 patients, 224 male (72%), mean age of 59.5±13 years (range, 18 to 88 years), with an acute type A aortic dissection were referred for surgery. Type A aortic dissection was defined as involvement of the ascending aorta according to previously published criteria [7]. The dissection was considered *acute* if symptoms occurred within 14 days. Fifteen patients had Marfan syndrome (5%), 16 had a bicuspid aortic valve (5.2%). On admission, 99 patients (32%) had some degree of aortic valve regurgitation. Twenty-one patients (7%) had undergone previous cardiac surgery [23 procedures: aortic valve replacement=13 (7%); mitral valve replacement=3 (1%); CABG=3 (1%); others=4 (1.2%)]. Diagnosis was usually established by an aortography till the early nineties (99/311; 32%), and by computed tomography scan, magnetic resonance imaging, and/or transesophageal echocardiogram since. If diagnostic information was complete at admittance, patients were transferred to the operating room for immediate surgery without any delay. Intraoperative control of aortic valve function and additional informations were determined with transesophageal echocardiography, when available. The decision making process currently adopted at our institution is reported in Fig. 1.

Significant clinical data and patient demographics are listed in Table 1. Age distribution of patients is reported in Fig. 2. Neurologic dysfunction was always included when considered related to the dissection process regardless of its onset.

All clinical data were obtained by retrospective review of hospital records. Several variables were recorded for analysis including: date of surgery, demographics (age, sex), etiological (family history, Marfan, hypertension, bicuspid aortic valve, diabetes, obesity, smoke, prior cardiac surgery), clinical (onset of pain, aortic regurgitation, cardiac tamponade, myocardial ischemia, hypothension, neurological deficit including paraplegia, pulse deficit, mesenteric

Table 1
Preoperative Data

Patients	311
Gender, male (%)	224 (71%)
Age (yrs)	59±13 (18–88 yrs)
Marfan syndrome	15 (5%)
Bicuspid aortic valve	16 (5%)
Aortic valve regurgitation	99 (32%)
Previous cardiac surgery	21 (7%)
Cardiogenic shock/hypotension	74 (24%)
Cardiac tamponade	121 (39%)
Neurologic dysfunction	37 (12%)
Limb ischemia	59 (19%)
Acute renal failure	62 (20%)
Myocardial ischemia	12 (4%)
Mesenteric ischemia	3 (1%)