

## Surprising Facts in Acute Aortic Syndromes. The More We See, the Less We Save!

Christoph A. Nienaber and Hüseyin Ince

University of Rostock, Division of Cardiology, Rostock, Germany

The survey on acute aortic syndrome by the Spanish Society of Cardiology<sup>1</sup> reflects an important effort for monitoring both diagnostic pathways and therapeutic decision making around the difficult entity of acute aortic syndrome (AAS). The term “acute aortic syndrome” was coined some years ago and is increasingly recognized in the cardiovascular world as a heterogeneous group of patients with a similar clinical profile, presenting with a variety of acute aortic wall pathologies; while the subset of patients with full dissection is usually hypertensive and between 50 and 70 years of age, intramural hematomas, a precursor of dissection, and penetrating ulcers of the aorta are more frequently found in patients between ages 60 to 80 years. Conventionally, if the ascending aorta is involved, swift surgical repair should be considered in almost all cases according to current guidelines.<sup>2</sup>

The authors of the Spanish registry also understand acute aortic syndrome as a spectrum of conditions ranging from intramural hematoma of the aortic wall to full dissection and symptomatic penetrating aortic ulcers; they collected comprehensive data from specialized tertiary centres in Spain that provided both 24 hours diagnostic and cardiac surgical services for any aortic condition. Thus, these hospitals may not necessarily reflect the usual standard of care, and may even deliver better care than the “real world.” Considering that the survey mostly derived data input from such tertiary centres it is particularly surprising that outcomes of patients with life-threatening aortic conditions were not

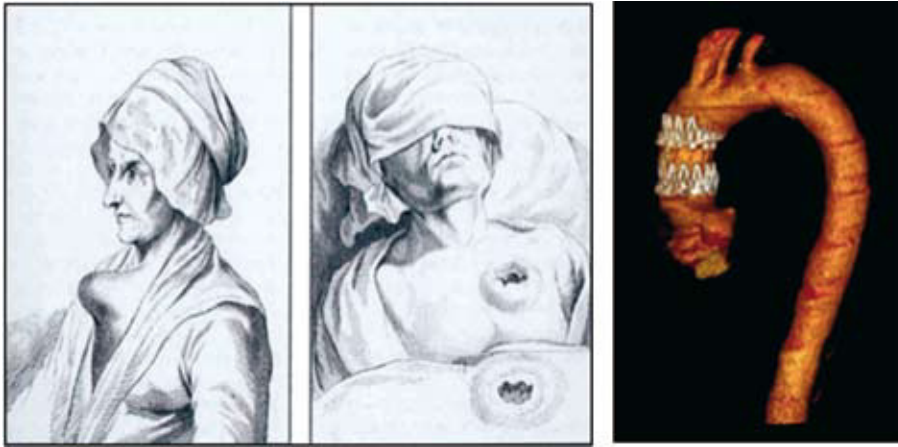
improved despite documented improvement in diagnostic efficiency. On aggregate, the efforts of the Spanish Cardiac Society resulted in fact in demographic observations very similar to those made by the International Registry of Acute aortic Dissection (IRAD) on a broader scale with the finding of around 80% of classic dissection, 15% in the state of intramural hematoma (IMH), and 5% with symptomatic penetrating aortic ulcer (PAU).<sup>3-8</sup> Moreover, comorbidities, clinical symptoms, and age distribution were similar in Spain compared to the rest of the world.<sup>3,5</sup> Similarly, both the diagnostic preferences and therapeutic strategies were pretty similar in Spain and in IRAD.<sup>9</sup> In fact, similarities between observations in Spain and in the IRAD are not surprising; considering that IRAD is the largest international registry on aortic dissection now with more than 2200 patients under continuing surveillance since 1996, the Spanish data match very well with the global scheme<sup>6,8,10,11</sup> derived from 18 participating hospitals using standardized record forms for patients with acute aortic syndromes, especially classic dissection.

Yet, what are the particular advantages and merits of this Spanish survey? First, the mere fact to generate national figures on outcomes and therapeutic strategies in a relatively low incidence, but high impact disease conditions deserves our respect and may certainly be instrumental to trigger the awareness of national health communities and hospital administration to install the appropriate algorithms in every hospital offering emergency care, and furthermore to create referral networks to transfer patients to tertiary care hospitals with “aortic care centers” in the attempt to eventually improve therapy and outcomes.

While with the proliferation of tomographic imaging especially CT scanning, the early consultation of cardiologists, and the slowly improving awareness the diagnostic recognition of AAS has improved, the outcomes of patients, even through diagnosed within 24 hours, has not followed suit, but remained sobering and serious with an overall in-hospital mortality of 35.4%<sup>1</sup>; with proximal dissection in-hospital mortality reached as high as

SEE ARTICLE ON PAGES 255-62

Correspondence: Dr C.A. Nienaber,  
Department of Internal Medicine, Division of Cardiology, University of  
Rostock,  
Ernst-Heydemann-Str. 6. 18055 Rostock, Germany  
E-mail: christoph.nienaber@med.uni-rostock.de



**Figure 1.** Advances in understanding aortic diseases over time. Left: drawing by J. Verbrugge (1973) illustrating death by rupture of a protruding dissecting aneurysm of the ascending aorta after treatment with bedrest, starvation, and sedation. Right: successful endovascular repair and remodeling of a localized proximal aortic dissection presenting as acute aortic syndrome.

41.1% although around 80% of patients underwent swift surgery, while distal dissection was associated with a 22.8%<sup>1</sup> early mortality similar to IRAD.<sup>10</sup>

Compared to recent scientific studies and surveys in countries with managed care these figures are a cause of concern and could be either the sobering mirror of the real world or a reflection of inferior (or insufficient) therapy contrasting of improved diagnostic efforts.<sup>11,12</sup> In other words, the national societies obviously offer enough diagnostic potential, but still need to improve therapeutic results. This however, is not easy considering the low incidence of the problem and the limited exposure of young surgeons during their career; moreover, the improved and more rapid diagnostic work-up leads automatically to less (unwanted) biological selection and more patients reaching a tertiary center in extremis (with a high chance to die intra- or postoperatively), who—earlier—would have died in the field (Figure).

Both observations, the relatively low incidence of the problem and the increasingly critical conditions of many patients with proximal AAS call for centers of excellence selected to cover a given geographical region; those centers should be connected to surrounding referring hospitals and emergency departments (themselves responsible for swift and correct diagnosis) and provide a 24/7 service for receive any acute and complicated case of AAS. Such structural efforts by health authorities together with continuously reiterated diagnostic training and awareness campaigns are likely to eventually also improve short-term outcomes and long-term

prognosis of patients with acute aortic syndromes. Sadly, what scientific studies have shown as a proof of concept is still a challenge in the real world today.

## REFERENCES

1. Evangelista A, Padilla F, López-Ayerbe J, et al. Spanish Registry of Acute Aortic Syndrome (RESA) Improvement in Diagnosis is not reflected in Reduction of Mortality. *Rev Esp Cardiol.* 2009;62:255-62.
2. Ince H, Nienaber CA. Management of acute aortic syndromes. *Rev Esp Cardiol.* 2007;60:526-41.
3. Hagan PG, Nienaber CA, Isselbacher EM, Bruckman D, Karavite DJ, Russman PL, et al. The international registry of acute aortic dissection (IRAD). New insights into old disease. *JAMA.* 2000;283:897-903.
4. Nienaber C, Eagle K. Aortic dissection: New frontiers in diagnosis and management. Part I: From etiology to diagnostic strategies. *Circulation.* 2003;108:772-8.
5. Tsai TT, Nienaber C, Eagle KA. Acute aortic syndromes. *Circulation.* 2005;112:3802-13.
6. Trimarchi S, Nienaber CA, Rampoldi V, Myrmet T, Suzuki T, Mehta RH, et al. Contemporary results of surgery in acute type A aortic dissection: The international registry of acute aortic dissection experience. *J Thorac Cardiovasc Surg.* 2005;129:112-22.
7. Trimarchi S, Nienaber CA, Rampoldi V, Myrmet T, Suzuki T, Bossone E, et al. Role and results of surgery in acute type B aortic dissection. Insights from the international registry of acute aortic dissection (IRAD). *Circulation.* 2006;114:1357-64.
8. Kische S, Akin I, Ince H, Rehders TC, Schneider H, Ortak J, Nienaber CA. Stent-graft repair in acute and chronic diseases of the thoracic aorta. *Rev Esp Cardiol.* 2008;61:1070-86.

9. Moore AG, Eagle KA, Bruckman D, Moon BS, Malouf JF, Fattori R, et al. Choice of computed tomography, transesophageal echocardiography, magnetic resonance imaging, and aortography in acute aortic dissection: International Registry of Acute Aortic Dissection (IRAD). *Am J Cardiol.* 2002;89:1235-8.
10. Tsai TT, Isselbacher EM, Trimarchi S, Bossone E, Pape L, Januzzi JL, et al. Acute type B aortic dissection: does aortic arch involvement affect management and outcomes? Insights from the International Registry of Acute Aortic Dissection (IRAD). *Circulation.* 2007;116:1150-6.
11. Winnerkvist A, Lockowandt U, Rasmussen E, Rådegran K. A prospective study of medically treated acute type B aortic dissection. *Eur J Vasc Endovasc Surg.* 2006;32:349-55.
12. Estrera AL, Miller CC, Goodrick J, Porat EE, Achouh PE, Dhareshwar J, et al. Update in outcomes of acute type B aortic dissection. *Ann Thorac Surg.* 2007;83:8425.