Injury, Int. J. Care Injured 44 (2013) 1191–1197

Contents lists available at SciVerse ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Blunt traumatic aortic injuries of the ascending aorta and aortic arch: A clinical multicentre study

Victor X. Mosquera [a,*], Milagros Marini [b], Javier Muñiz [c], Daniel Gulias [b], Vanesa Asorey-Veiga [d], Belen Adrio-Nazar [e], José M. Herrera [a], Gonzalo Pradas-Montilla [d], José J. Cuenca [a]

[a] Department of Cardiac Surgery, Complejo Hospitalario Universitario de A Coruña, Spain
[b] Department of Interventional Radiology, Complejo Hospitalario Universitario de A Coruña, Spain
[c] Instituto Universitario de Ciencias de la Salud, Universidad de A Coruña, Spain
[d] Department of Cardiac Surgery, Complejo Hospitalario Universitario de Vigo, Spain
[e] Department of Cardiac Surgery, Complejo Hospitalario Universitario de Santiago de Compostela, Spain

ARTICLE INFO

Article history:
Accepted 9 December 2012

Keywords:
Aorta
Aortic arch
Trauma surgery
Emergency

ABSTRACT

Objective: To report the clinical and radiological characteristics, management and outcomes of traumatic ascending aorta and aortic arch injuries.
Methods: Historic cohort multicentre study including 17 major trauma patients with traumatic aortic injury from January 2000 to January 2011.
Results: The most common mechanism of blunt trauma was motor-vehicle crash (47%) followed by motorcycle crash (41%). Patients sustaining traumatic ascending aorta or aortic arch injuries presented a high proportion of myocardial contusion (41%); moderate or greater aortic valve regurgitation (12%); haemopericardium (35%); severe head injuries (65%) and spinal cord injury (23%). The 58.8% of the patients presented a high degree aortic injury (types III and IV). Expected in-hospital mortality was over 50% as defined by mean TRISS 59.7 (SD 38.6) and mean ISS 48.2 (SD 21.6) on admission. Observed in-hospital mortality was 53%. The cause of death was directly related to the ATAI in 45% of cases, head and abdominal injuries being the cause of death in the remaining 55% cases. Long-term survival was 46% at 1 year, 39% at 5 years, and 19% at 10 years.
Conclusions: Traumatic aortic injuries of the ascending aorta/arch should be considered in any major thoracic trauma patient presenting cardiac tamponade, aortic valve regurgitation and/or myocardial contusion. These aortic injuries are also associated with a high incidence of neurological injuries, which can be just as lethal as the aortic injury, so treatment priorities should be modulated on an individual basis.

© 2012 Elsevier Ltd. All rights reserved.

Introduction

The aortic isthmus is by far the most common site of acute traumatic aortic injury (ATAI), but up to 10% of cases of ATAI occur in atypical locations including the aortic arch, the ascending aorta and the peridiaphragmatic aorta.[1–3] Among those atypical sites of ATAI, the ascending aorta and aortic arch injuries outstand because of their ominous prognosis. They are highly lethal as most victims die at the scene of the accident or during transportation.[4,5] Although improvement in restraints has decreased the incidence of ascending aorta and aortic arch traumatic injuries related to motor-vehicle collisions in last decades,[1,6] the prognosis of those aortic injuries remains poor. The management of ATAI of ascending aorta and aortic arch and its effect on outcomes are less documented than those of injuries at the isthmus and beyond. Most studies in the last decade about management of ATAI have only focused on injuries at the level of the aortic isthmus and descending aorta, which are more amenable to thoracic endovascular aortic repair (TEVAR), there being a lack of up-to-date information about the management and long-term outcomes of ATAI of the ascending aorta and aortic arch.

The objective of this study is to report the clinical and radiological characteristics, management and early and long-term survival of a multicentre series of traumatic ascending aorta and aortic arch injuries.

* Corresponding author at: Cardiac Surgery Department, Complejo Hospitalario Universitario de A Coruña, As Xubias nº84, CP 15006, A Coruña, Spain.
Tel.: +34 981178000x298814/699054009; fax: +34 981178299.
E-mail addresses: Victor.X.Mosquera.Rodriguez@sergas.es, vxmr@yahoo.es (V.X. Mosquera).

0020–1383/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.injury.2012.12.011

Patients and methods

This is a historic cohort multicentre study with 3 participating institutions, which are the reference first-level trauma centres for ATAI in a Spanish region of more than 2,700,000 inhabitants. A total of 85 consecutive major trauma patients with ATAI were admitted from January 2000 to January 2011, among which 17 major trauma patients with traumatic injury at the ascending aorta or the aortic arch were identified. No patient who reached alive to hospital sustained traumatic aortic injuries at multiple locations.

Fig. 1 depicts a flow diagram describing the design of the study and the flow of patients.

Data on 96 variables were recorded on a standardised form that included information on patient demographics, mechanism of injury, initial clinical presentation (blood pressure, respiratory rate, need of endotracheal intubation at the site of the trauma or during transport, Glasgow Coma Scale [GCS]), Injury Severity Score (ISS),[7] Abbreviated Injury Score (AIS) for each body area (head, chest, abdomen, extremities), Revised Trauma Score (RTS),[8] Trauma Injury Severity Score (TRISS),[9] Traumatic Aortic Injury Score (TRAINS),[10] head and neck injuries, nonmediastinal thoracic injuries, cardiac injuries, abdominal injuries, pelvic fracture, extremities fractures, findings on admission simple chest X-ray, performed diagnostic imaging tests (computed tomography (CT), angiography, transthoracic and/or trans-oesophageal echocardiogram (TEE)).

An ISS score of more than 50 points predicts a mortality rate of over 50%, while a score of more than 70 points predicts a mortality rate of nearly 100%.[7] The TRISS score directly predicts the expected death rate for blunt trauma.[9]

A TRAINS score equal or greater than 4 points is highly predictive of the probability of presenting an ATAI in major trauma patients.[10]

The aortic injuries were classified according to their severity in type I (intimal tear), type II (intramural haematoma), type III (pseudoaneurysm), or type IV (rupture) following clinical practice guidelines of the *Society for Vascular Surgery*.[11] The type of definitive management (conservative treatment or surgical repair) was also recorded.

The mechanisms of blunt trauma were classified as: motor-vehicle crash; motorcycle crash; fall; pedestrian-vehicle accident; crush under weight, and others. Hypotension was defined as a systolic blood pressure <90 mmHg or the need of fluid and/or inotropic support to maintain a blood pressure ≥90 mmHg. An abnormal respiratory rate was defined as bradypnea <10 breaths/min or tachypnea >30 breaths/min. A GCS below 9 points was defined as cut-off value for neurological bad prognosis on admission. Head injury was defined as skull fracture, unconsciousness at evaluation, subarachnoid haemorrhage, epidural or subdural haemorrhage.

In cases of motor-vehicle crash patients, information on vehicular speed and seat belt and/or other restraint systems use was not generally available and was not studied.

Diagnosis was based on imaging (TEE, angiography and/or CT scan) and, when available, confirmation was provided by surgical visualisation and/or autopsy. There was no disagreement in data provided by imaging studies. All patients who presented an ATAI at the ascending aorta or the aortic arch underwent a TEE evaluation of the aortic valve and the severity of an acute aortic regurgitation (AR), when present, was graded on the basis of published criteria in mild, moderate or severe AR.[12] An AR greater than moderate was considered significant.[12] All participating centres used the same CT scan acquisition protocols for trauma patients requiring advanced imaging tests.

Penetrating trauma was exclusion criterion in the study. All participating centres used the same the inclusion/exclusion criteria.

The Institutional Review Board approved this study based on retrospective data retrieval, waiving for individual consent.

Conservative treatment

Medical treatment consisted of strict control of both contractility and blood pressure by continuous intravenous infusion of a vasodilator, and limitation of intravenous fluid infusion once the systolic blood pressure exceeded 100 mmHg. Initial medical stabilisation with beta-blockers controlled these parameters reducing heart rate and blood pressure to the lowest amounts that still maintain adequate end-organ perfusion. The systolic blood pressure was titrated to approximately 100 mmHg and the heart rate to <60 bpm. Unless there were contraindications, labetalol was our drug of choice. Anti-hypertensive therapy was changed to oral administration once the patient was haemodynamically stable enough. This practice only deviated in the respect that patients with evidence of increased intracranial pressure were considered immediate operative candidates in order to

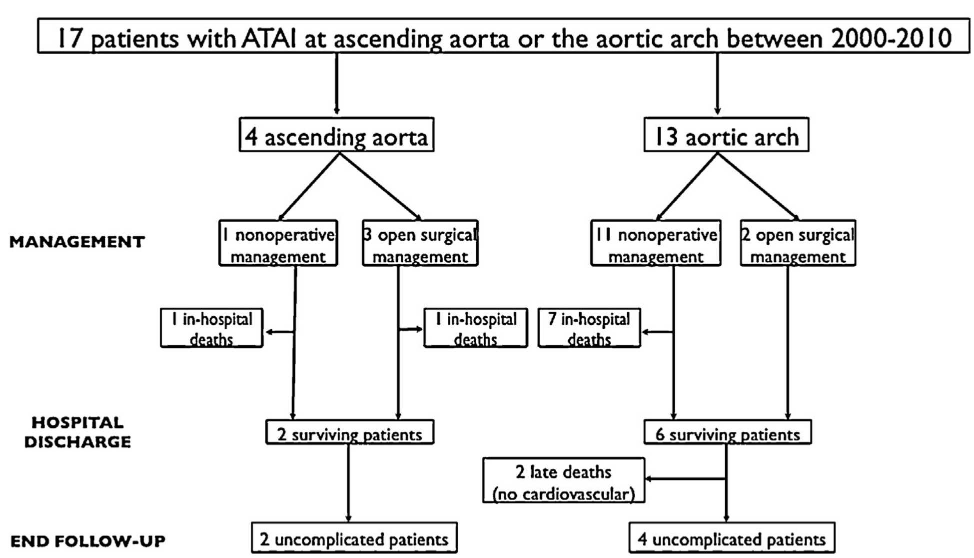

Fig. 1. Flow chart depicts the distribution of the 17 patients enrolled in the study.

Download English Version:

https://daneshyari.com/en/article/3240387

Download Persian Version:

https://daneshyari.com/article/3240387

Daneshyari.com