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Short communication

Evolution and prognosis of intramural aortic hematoma. Insights from a midterm cohort study

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ABSTRACT

Background: Although several hypotheses have been proposed, the true origin and pathogenesis of aortic intramural hematoma (IMH) remain unclear. Evolution of patients with aortic IMH is highly variable. Progression to classic aortic dissection, aneurysm or to complete resolution have been described.
Our purpose was to assess in-hospital and mid-term evolution of patients with aortic IMH.
Methods: From 2000 to 2015, 40 patients with aortic IMH were prospectively and consecutively recruited in a tertiary care referral center. Aortic IMH was defined as the presence of a circular or crescent-shaped thickening of the aortic wall (≥5 mm) in the absence of detectable blood flow inside, within the context of acute aortic syndrome.
Results: Twenty three patients (57.5%) had type A, and 17 (42.5%) type B IMH. Up to 34.7% of patients with type A and 47.1% with type B IMH showed intimal tears in the imaging test at admission. In-hospital mortality was higher in the type A IMH group. All-cause mortality after discharge was 20%, without significant differences among groups. Out of hospital death was related to the aortic pathology in just one patient. At follow-up, radiological persistence of IMH was observed in 35.7% of patients with type A and 60% of those with type B IMH.
Conclusions: IMH related mortality takes place primarily during the acute phase of the disease. Clinical evolution after discharge is favorable, either in cases of reabsorption or persistence of the IMH. Imaging test findings rekindle the debate on the true training mechanism of the aortic IMH.

1. Introduction

Aortic intramural hematoma (IMH) is an entity encompassed within the acute aortic syndrome, along with the classic acute aortic dissection and penetrating aortic ulcer [1]. By definition, IMH is characterized by a hemorrhage within the aortic wall media in absence of an intimal tear and a false aortic lumen [1]. Although several hypotheses have been proposed, the true origin and the pathogenesis of aortic IMH remain unclear [2–5]. Evolution of patients with aortic IMH is highly variable, and progression to classic aortic dissection, aneurysm or to complete resolution of injury have been described [6]. Current guidelines for the management of aortic diseases recommend the same therapeutic approach for both IMH and classic aortic dissection [1]. However, controversy still exists on the proper management of patients with aortic IMH [7–9].

Our purpose was to assess in-hospital and mid-term evolution of patients with aortic IMH, in a wide cohort of patients recruited from a referral hospital for the treatment of aortic diseases. Moreover, we aimed to evaluate radiological progress of this patient population.

2. Methods

From August-2000 to October-2015, all patients admitted with acute aortic syndrome in our hospital, a tertiary care referral center, were prospectively and consecutively recruited in a dedicated database. For the present study we focused on patients with aortic IMH (N = 40). For analytical purposes, and based on its different prognosis, patients were classified into two groups: Type A (n = 23), patients with involvement of the ascending aorta; and Type B (n = 17), patients with unaffected ascending aorta.

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In all patients, the diagnosis was achieved on the basis of the clinical history and imaging techniques: computerized tomography (CT), transesophageal echocardiography or magnetic resonance. When the diagnosis was initially made by echocardiography, the study was completed with a CT or a magnetic resonance in every case. All patients underwent a transthoracic echocardiogram at admission. At least two imaging tests were performed during hospitalization, one at the time of diagnosis and another before hospital discharge. Imaging tests were repeated in case of appearance of new symptoms.

Aortic IMH was defined as the presence of a circular or crescent-shaped thickening of the aortic wall (≥5 mm) in the absence of detectable blood flow inside, and accompanied by a clinical presentation compatible with acute aortic syndrome [1]. Classic aortic dissection was defined as a disruption of the intimal layer resulting in separation of the aortic wall layers and subsequent formation of true and false aortic lumens [1]. Ulcer like projection (ULP) were defined as intimal layer interruptions in involved aortic segments, detected with imaging techniques, not resulting in tracking of the blood in a dissection plane within the media (Fig. 1A–C). The identification of small contrast accumulations inside the IMH not in contact with the true aortic lumen in the imaging test were not considered as intimal tears, and were called intramural blood pool (IBP) (Fig. 1E).

Patients with type A aortic IMH underwent urgent surgery routinely, unless contraindication, whereas those patients with type B aortic IMH were medically managed initially. In case of refractory pain, uncontrolled hypertension, visceral damage, or expanding hematoma in radiologic controls, despite adequate medical therapy, open surgery or endovascular treatment was considered [1].

After hospital discharge, all patients were followed up in a dedicated clinic, specifically designed for aortic diseases. During the follow-up, imaging tests were performed annually or biannually in stable patients. This registry was approved by the local ethical committee. Uncontrolled hypertension during follow-up was considered as systolic blood pressure (SBP) over 120 mm Hg.

Continuous variables are reported as mean and standard deviation or median and interquartile range in cases of asymmetry. Comparison among groups was done by the Student's *t*-test or Mann-Whitney *U* test when necessary. Categorical variables are expressed as a frequency and a percentage and were compared with the $\chi 2$ test and Fisher's exact test when appropriate. All tests were two-tailed and differences were considered statistically significant at p-value <0.05. Statistical analysis was performed with PASW Statistics V 17.0 (SPSS Inc. Chicago, IL, USA).

3. Results

Mean age of our patient population was 73.5 ± 10.1 years and 62.5% of patients were male. Baseline characteristics, data on clinical presentation and results of the complementary tests at admission are detailed in Table 1. Hypertension was the most common risk factor

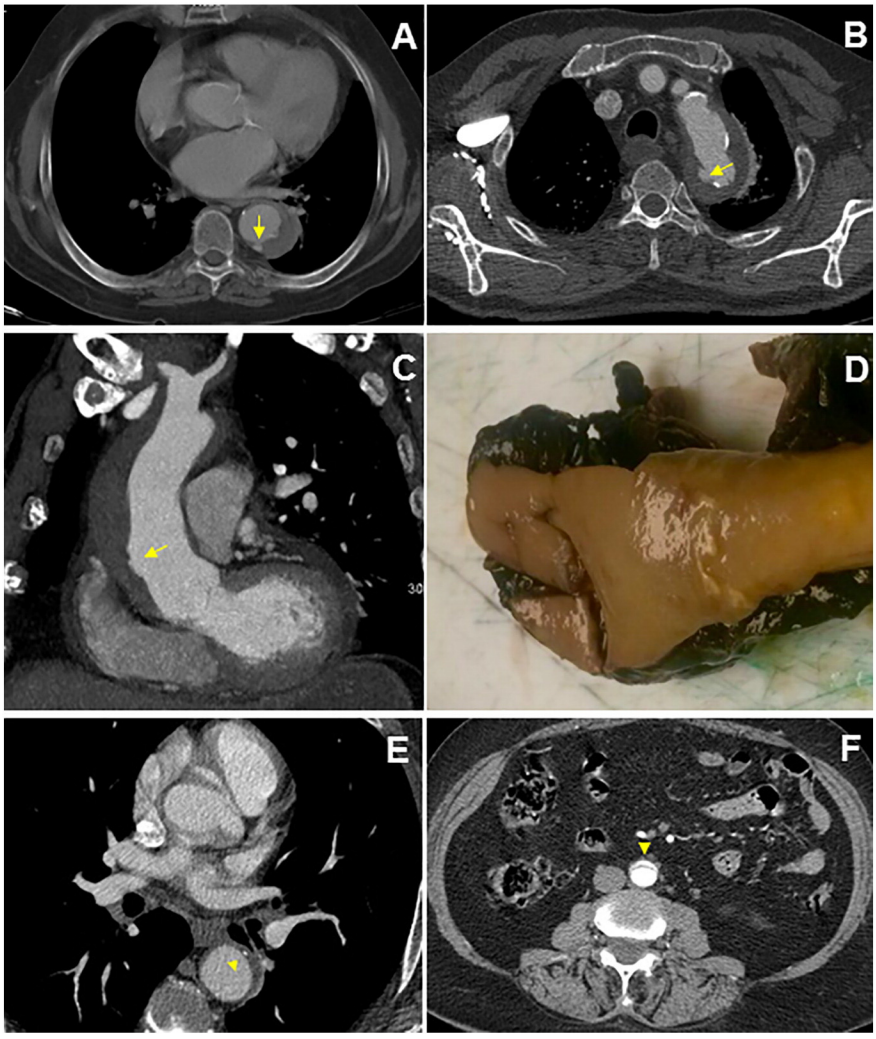

Fig. 1. A, B, C: Computerized tomography images showing aortic intramural hematoma with ulcer like projection in involved segments (arrow). D: Anatomical piece of the aortic wall corresponding to the same patient of image C, in whom the existence of an intimal tear was demonstrated. E: Small contrast accumulation inside the intramural hematoma, not in contact with the true aortic lumen, called intramural blood pool (arrowhead). F: Computerized tomography image of aortic dissection in distal segments of a patient with aortic intramural hematoma (arrowhead).

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