

Epicardial Lesions in Chagas' Heart Disease Reflect an Inflammatory Process

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Summary

Objectives: Furnish a more detailed anatomicopathological description of the epicardial lesions in chronic chagasic cardiopathy, evaluate their incidence and discuss their probable pathogenesis

Methods: We examined the hearts of 39 chronic chagasic cardiopathy patients who underwent autopsies and submitted to histological analysis the epicardial lesions.

Results: Milk spots, characterized by well defined white areas in the epicardium were found in 80% of the cases, mainly on the anterior face of the right ventricle. Histological analysis revealed abrupt fibrous thickening of the epicardium, with no elastic fibers, inflammation or blood vessels. Chagasic rosary, characterized by small round whitish granules deposited sequentially along the coronary vessels were present in 23% of the hearts. They presented the same histological structure as the milk spots, but interestingly were only found immediately above the coronary artery branches. Villous plaque was found on the apex or anterior face of 21% of the hearts. It is characterized by an exophytic aspect, probably due to previous localized pericardial adhesion. Microscopic analysis revealed foci of inflammatory infiltrate and vascular proliferation, typical of epicarditis still under organization. In addition to the lesions described above, the vast majority of cases presented sparse mononuclear inflammatory cells with occasional foci.

Conclusion: We concluded that epicardial lesions related to chronic chagasic heart disease are probably a result of epicardial reactions to chronic inflammatory process.

Key words: Chagas disease, chronic chagasic heart disease, epicardium, chagasic rosary.

Introduction

Roughly 30% of the people infected with the protozoa *Trypanosoma cruzi* in Latin America will develop chronic chagasic heart disease. Myocardial lesions, characterized by myocyte hypertrophy, chronic myocarditis and fibrosis have been studied extensively, and are related to arrhythmias and the development of congestive heart failure¹. Nevertheless, despite the use of ablation techniques via the epicardium to treat ventricular arrhythmias in chronic chagasic heart disease², little attention has been paid to the lesions present in that layer. These alterations were briefly described in old issues of journals and academic textbooks as milk spots, chagasic rosary and villous plaque³⁻⁶. The objective of the present study is to furnish a more detailed anatomicopathological description of these lesions, evaluate their incidence and discuss their probable pathogenesis.

Methods

Between January 2003 and March 2005, 49 chronic chagasic cardiopathy patients underwent autopsies at our hospital.

All but one of the hearts were available for examination. Nine cases were excluded from the study since either the epicardium had been completely or partially removed or the presence of diffused pericarditis hindered examination. The epicardium of the remaining 39 hearts were macroscopically examined in search of the anatomicopathological lesions described in Chagas disease, whether milk spots, chagasic rosary or villous plaque. Representative lesions of each category were removed, sectioned and routinely processed for embedding in paraffin. Sequential 4 μ m thick histological sections were stained using hematoxylin-eosin, Masson's trichrome and Verhoeff's method for elastic fibers; they were examined with a standard optical microscope.

Results

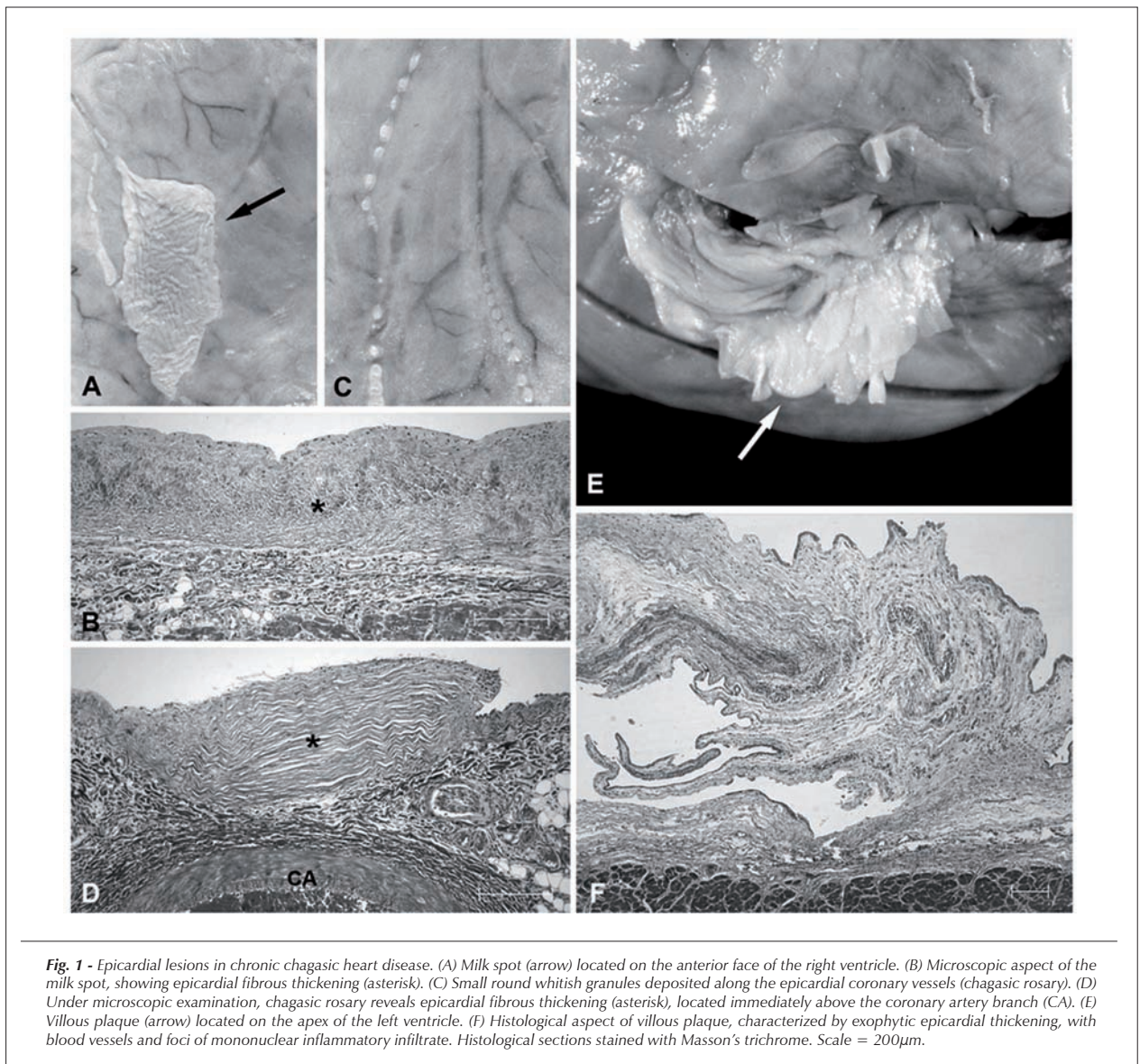
The epicardium of practically all the cases presented opaque and whitish areas. Milk spots, characterized by well defined white areas on the ventricular epicardium were present in 31 of 39 (80%) hearts. The spots presented variable configurations, reasonably precise borders and their largest measurement ranged from 0.5 to various centimeters. Even though they were found more often and were larger on the anterior face of the right ventricle, they occurred in any region of the heart (Fig. 1A). Histological examination of the milk spots demonstrated abrupt fibrous thickening of the epicardium with a parallel arrangement of densely compacted

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collagen fibers, no inflammatory infiltrate, blood vessels or elastic fibers (Fig. 1B).

Chagasic rosary was characterized by small round whitish granules sequentially deposited along the coronary vessels. Measurements were as high as 1mm in diameter and they were detected in 9 of 39 (23%) hearts (Fig. 1C). Chagasic rosary presented the same histological characteristics as the milk spots but was only found immediately above the coronary artery branches (Fig. 1D).

Villous plaque, characterized by well defined areas of exophytic epicardial thickening, was observed in 8 of 39 (21%) hearts. The lesion was located on the apex or anterior face of the organ and presented clearly defined borders; it was easily distinguished from the normal neighboring epicardium (Fig. 1E). Histological examination revealed multiple foci of mononuclear inflammatory infiltrate and blood vessels

dispersed throughout the collagen deposit (Fig. 1F).

The epicardium of most patients presented sparse mononuclear inflammatory cells with occasional foci.

Discussion

Milk spots are considered scar tissue lesions of chronic epicarditis. They have been described in patients with various heart diseases, particularly chronic valve disease.^{5,7} Even though inflammatory cells usually infiltrate the myocardium in chronic chagasic heart disease^{1,3-6}, it is also present in the epicardium, causing chronic epicarditis. In the milk spots, the absence of inflammatory cells and vascular proliferation and the presence of densely compacted collagen fibers suggests that these lesions really are scars as there is no further local inflammation. In the present study, we confirmed a high incidence of milk spots in chronic chagasic heart disease (80%).

Brief Comments

Chagasic rosary was present in 23% of the hearts examined. Considering that its histological structure is identical to milk spots, rosary probably has the same pathogenesis, that is, it is a scar tissue lesion of chronic epicarditis. Regardless of its intriguing and characteristic location, above the coronary artery branches, there is no satisfactory explanation for this distinct trait. Even though we did not find reports of similar lesions in other heart diseases, the presence of rosary along the epicardial coronary arteries is considered as a characteristic but not a pathognomonic lesion of the chagasic etiology.^{3,5}

Villous plaque was present in 21% of the hearts with chronic chagasic heart disease. Its histological structure, with multiple foci of inflammatory infiltrate and numerous blood vessels, as

well as collagen deposits, is characteristic of epicarditis still under organization. The cause of its well established location and exophytic aspect are not clear, but we can speculate that there was prior pericardial adhesion in that region.

Therefore, the three categories of epicardial lesions in chronic chagasic heart disease, or in other words, milk spots, chagasic rosary and villous plaque, probably have the same pathogenesis: epicardial reaction to chronic inflammatory process. Villous plaque is probably more recent than the other two lesions and is related to previous localized pericardial adhesion. The cause of the characteristic location of chagasic rosary, immediately above the coronary artery branches, is unknown.

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