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SUDDEN CARDIAC DEATH OF A YOUNG FOOTBALL PLAYER

Abstract: The overall estimated risk of Sudden Cardiac Death in the young is 1/100,000. It may occur during physical activity and the underlying possible causes are multiple. The case here reported concerns an apparently healthy 29-year-old male that dropped unconscious during a recreational football game. Reanimation manœuvres were not successful. The autopsy revealed anomalous left coronary artery arising from the pulmonary artery (ALCAPA), associated to hypoplasia of the circumflex and to tortuosity and acute thrombosis of the right coronary artery. Congenital Anomalies of Coronary Arteries are a relevant cause of sudden and unexpected death, often during childhood and adolescence.

Keywords: Sudden death, young, sports, coronary malformations

Introduction

The overall estimated risk of Sudden Cardiac Death in the young is 1/100,000¹. It may occur during physical activity^{2,3} (in some series around 10.8%) and the underlying possible causes are various.⁴

Material and methods

The authors report a case of an apparently healthy 29-year-old male that dropped unconscious during a recreational football game. Reanimation manœuvres were immediately performed without success and he was declared dead at the Hospital emergency room soon afterwards.

A postmortem examination was done.

Results

The autopsy revealed – on macroscopic examination – generalized congestion of the organs, lung œdema and a heart weighing 480g and presenting markedly elongated, tortuous and dilated right coronary artery, which in section is acutely thrombosed (Figures 1, 2), anomalous origin of the left descending branch of the coronary artery

from the pulmonary trunk (Figures 3, 4) and hypoplasia of the circumflex branch. Microscopic examination disclosed slight atherosclerosis (type II of the “American Heart Association” classification) in the right coronary artery, but with erosive features, underlying the fresh thrombus (Figure 5). It also showed myocardial hypertrophy and adaptative changes of intra-myocardial coronary arteries (Figure 6).

Discussion

Congenital anomalies of coronary arteries are not frequent (0.2-1%), but are a high risk factor for arrhythmias, angina, infarction and sudden death.⁵ They display a considerable number of morphology variety (in origin, orientation, etc), some being rarer and/or more life-threatening than others.⁵ In fact, ALCAPA – Anomalous Left Coronary Artery arising from the Pulmonary Artery – is an unusual type, to which few persons survive childhood without surgical intervention and of those who do, up to 90% die suddenly before 35 years.^{6,7} It was first described in 1933, as Bland-White-Garland syndrome.⁶ The anomalous origin of the coronaries from the pulmonary artery is especially prone to cardiomegaly, myocardial hypertrophy, myocardial scars and adaptative remodelling of intra-myocardial coronary branches. These morphological changes plus eventual extrinsic compression of the anomalous vessel are mostly responsible for the clinical outcome. The case reported also presented a hypoplastic circumflex and a distorted right coronary artery. The erosive pattern of the atherosclerosis, that is: the presence of very superficial aggregates of foam cells, just beneath the endothelium, favours its erosion in the setting of the vessel “ondulation” and of the increased blood flow – due to exercise –, leading to thrombosis.⁴ Through the years, two clinical classifications have been put forward, in order to better deal these patients. The first in 1968 by *Wesselhoeft et al* and the second in 2003 by *Rigatelli*.^{8,9} Due to the clinical presentation, this case is included in group IV of the former (sudden death in adults / young adults) and in group III – IV of the latter (related to sudden death, but with atherosclerosis).^{8,9}

Conclusions

1) Congenital anatomic anomaly of coronary arteries is an important cause of sudden death during physical activity and sports. 2) Anomalous origin of the left coronary artery from the pulmonary artery is rare but usually lethal. 3) When present at autopsy, it accounts with *certainty* to the sudden death final event; complemented, in this case, with acute right coronary artery occlusion due to thrombosis.

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