INTRODUCTION

Kounis syndrome is an acute coronary syndrome (ACS) caused by an anaphylactoid reaction secondary to noxa. It is caused by the overproduction and degradation of mast cells that play a role in the pathophysiology of significant coronary vasospasm that can produce myocardial ischemia and symptoms indistinguishable from a type 1 myocardial infarction (due to rupture or erosion of the atherosclerotic plaque).1

We present the case of a pediatric patient who presented with ACS after a loxosceles bite that remitted after the administration of anti-loxosceles serum.

CASE PRESENTATION

A 9-year-old male patient with a history of allergic rhinitis and allergy to peanuts was admitted to the emergency department of a rural clinic due to retrosternal acute chest pain of intensity 7/10 associated with diaphoresis and palpitations that began 2 hours after being bitten by a loxosceles laeta spider. On admission, the vital signs were heart rate of 110 beats bpm, SatO2 of 95%, and blood pressure of 100/60 mm Hg. The clinical history suggested acute myocarditis, which was the reason to request a study of cardiac bio-markers and an electrocardiogram; the local health unit did not have an echocardiogram available, so it was not possible to carry out this study. A complete blood count and a panel of immunoglobulins were also ordered. Out of these studies, cardiac bio-markers were within the normal ranges, with a troponin I level of 0.02 ng/mL (normal <0.04) and creatine kinase of 150 U/L (normal <200). In contrast, the electrocardiogram revealed marked ST-segment elevation in the anterior, anteroseptal, and lateral leads, with reciprocal depression in the inferior leads II, III, and aVF (Figure 1).

The other diagnostic studies revealed a mild leukocytosis (12 × 10³/ L) with an eosinophil count of 0.6 × 10³/L (normal <0.5) and an immunoglobulin E level of 350 UI/mL (normal <200 UI/mL). The rest of the laboratory analyses were within the normal parameters.

After being hospitalized, management with steroids and anti-loxosceles serum was started, leading to a sudden decrease in chest pain and normalization of the electrocardiogram (Figure 2). One month later, the patient was transferred to a hospital where a follow-up two-dimensional transthoracic echocardiogram (TTE) was performed to evaluate left ventricular (LV) global and regional systolic function, which showed normal diameters of the cavities, no evidence of wall motion abnormalities, and normal values of the systolic and diastolic biventricular function. No evidence of congenital heart disease was found (Figure 3, Videos 1-5).

DISCUSSION

The case described is a male pediatric patient with no history of heart disease who was admitted due to ACS in the context of an anaphylactoid reaction to a loxosceles bite.

Kounis syndrome (allergic infarction) is not an unusual condition, but its diagnosis can become challenging to the physician due to lack of awareness of this pathology.
Figure 1  Photograph of the electrocardiogram in sinus rhythm, heart rate of 107 bpm. ST-segment elevation in the anterior, antero-septal, and lateral leads, with reciprocal depression in the inferior leads II, III, and aVF. As the hospital medical records are kept on paper, no high-quality digital copy was available for this publication.

Figure 2  Photograph of the electrocardiogram in sinus rhythm, heart rate of 100 bpm. As the hospital medical records are kept on paper, no high-quality digital copy was available for this publication.
This syndrome has been associated with coronary artery vasospasm and is caused by mast cell degranulation and the release of proinflammatory mediators. In previous literature, it is often classified into 3 groups: type I, which corresponds to allergic vasospastic angina in patients without prior known coronary artery disease; type II, which is caused by an allergic myocardial infarction in patients with prior known coronary artery disease; and type III, which is associated with patients with stent thrombosis in whom a significant accumulation of mast cells and eosinophils is evident in the histopathological tissue sample. Thus, we infer that this case represents type I Kounis syndrome, the most common among the 3 types and the one with a better prognosis.

The case presented is interesting because when loxoscelism affects the myocardium, it generally manifests as myocarditis or a perimyocarditis with symptoms of chest pain and, in some cases, with positive cardiac biomarkers analysis.

The electrocardiogram showed a significant elevation of the extensive anterior ST segment with a reciprocal image in the inferior wall, suggesting an anterior descending artery obstruction.

Despite these electrocardiographic characteristics, the clinical history of loxoscelism, the patient’s age and the remission of the ST-segment elevation in less than 20 minutes led to a diagnosis of a vasospastic cause in the context of the anaphylactic reaction.

According to the ST-segment elevation ACS guidelines, primary percutaneous coronary intervention should be performed in patients with STEMI and ischemic symptoms in less than 12 hours. However, due to a rapid resolution of the patient’s symptoms and the unavailable coronary angiography setting at the rural facility, the management did not include an invasive procedure. Upon reflection, had the health setting been different, we believe clinical management would have been the same and a coronary computed...
tomography angiography would have been performed to exclude Kawasaki disease.

Anti-ischemic therapy for this condition is also controversial because it can aggravate the allergic reaction, as can steroid anti-inflammatory therapy. Furthermore, this therapy has been associated with worse outcomes in patients with myocardial infarction. Therefore, the management must be tailored to the individual.

After the complementary therapy, the patient was discharged with no symptoms. The parents were advised of a follow-up at an outpatient pediatric cardiology clinic, at which the patient has shown evidence of normalized systolic function and no symptomatic recurrence.

CONCLUSION

Kounis syndrome is a cause of coronary syndrome in pediatric patients that should be suspected whenever there is a history of a noxa. Although the most frequent cause of infarction in children is Kawasaki disease, it is crucial to be aware of the multiple causes that can lead to coronary artery syndromes in pediatric patients.

ETHICS STATEMENT

The authors declare that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans.

CONSENT STATEMENT

The authors declare that since this was a non-interventional, retrospective, observational study utilizing de-identified data, informed consent was not required from the patient under an IRB exemption status.

FUNDING STATEMENT

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DISCLOSURE STATEMENT

The authors report no conflict of interest.

SUPPLEMENTARY DATA

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