

## CASE REPORT

## PEER REVIEWED | OPEN ACCESS

## Raynaud's phenomenon after cold exposure: A case report

Marco Orsini, Antônio Marcos da Silva Catharino,  
Valéria Camargo Silveira, Carlos Henrique Melo Reis,  
Mauricio de Sant' Anna Junior, Carlos Eduardo Cardoso

## ABSTRACT

**Introduction:** Raynaud's phenomenon (RP) is described in the scientific literature as a clinical syndrome considered common, but poorly recognized, causing changes in the color of the fingers due to vasospasm. Such changes occur due to exposure to a cold environment, emotional stress or other physical or drug exposures.

**Case Report:** We report the case of a 42-year-old male patient (physician by profession) who, after exposure to cold, developed vasospasm and, consequently, changed in skin color.

**Conclusion:** Primary RP usually don't need pharmacological treatment, but investigation to secondary causes must be performed.

**Keywords:** Autonomic nervous system, Raynaud disease, Therapeutics, Vasospasm

## How to cite this article

Orsini M, da Silva Catharino AM, Silveira VC, Reis CHM, Junior MSA, Cardoso CE. Raynaud's phenomenon after cold exposure: A case report. Int J Case Rep Images 2021;12:101267Z01MO2021.

Marco Orsini<sup>1</sup>, Antônio Marcos da Silva Catharino<sup>2</sup>, Valéria Camargo Silveira<sup>2</sup>, Carlos Henrique Melo Reis<sup>2</sup>, Mauricio de Sant' Anna Junior<sup>3</sup>, Carlos Eduardo Cardoso<sup>4</sup>

**Affiliations:** <sup>1</sup>Department of Neurology – UNIG and Coordinator of the Academic Master's Degree in Neurology at the University of Vassouras, Brazil; <sup>2</sup>Iguaçu University – UNIG – Hospital Geral de Nova Iguaçu, Brazil; <sup>3</sup>Federal Institute of Education, Science and Technology of Rio de Janeiro – IFRJ, Brazil; <sup>4</sup>University of Vassouras, Vassouras – RJ, Brazil.

**Corresponding Author:** Antônio Marcos da Silva Catharino, Rua Gavião Peixoto 70, Room 811, CEP 24.2230-100, Icaraí, Niterói-RJ, Brazil; Email: neurocurso@globo.com

Received: 25 July 2021

Accepted: 15 October 2021

Published: 10 November 2021

Article ID: 101267Z01MO2021

\*\*\*\*\*

doi: 10.5348/101267Z01MO2021CR

## INTRODUCTION

Primary Raynaud's phenomenon (RP) is a common sign characterized by episodic color changes of acral parts of the body (pallor, cyanosis, rubor) lasting from a few minutes to hours, which are usually triggered by cold temperature and/or stress [1, 2]. Secondary RP is a symptom of an underlying disease. Raynaud's phenomenon has to be distinguished from other color changes of the distal extremities like acrocyanosis, erythromelalgia, perniosis, and Chilblain-Lupus [3].

Autoimmune rheumatic diseases like systemic sclerosis and systemic lupus erythematosus, as well as vascular diseases like arterial occlusions and compression syndromes, are also possibilities that should be taken into account in the differential diagnosis. The rheumatologist or general practitioner, therefore, should be aware of clinical findings that may differentiate to benign causes or syndromes/diseases that require specific treatment [3].

On the basis of physical examination, as well as the use of complementary exams, such as nail capillaroscopy and immunological tests, it is possible to differentiate primary from secondary RP situations. Treatment is aimed at preventing RP, thus avoiding the possibility of irreversible ischemic damage. We present a case of Raynaud's phenomenon associated with exposure to cold, but also a discussion of its pathophysiology and differential diagnosis.

## CASE REPORT

A 42-year-old male patient (physician by profession) reported that the first signs and symptoms emerged at approximately 16 years of age, mainly after exposure to cold temperatures and, in some cases, after emotional stress. Whenever he was exposed to baths with cold

water, like in swimming pools or waterfalls, he noticed that certain fingers had pale color. A slight progressive worsening of the condition was observed, initially, the clinical picture was located only in the little finger and, later, the second and third metacarpals of the left hand were also affected (feeling of cold, cyanosis, and partial loss of touch). Recently, he had noticed that other fingers on both hands had shown such a clinical finding, which lasted about 10 minutes, and improved after exposure to heat, when they become acyanotic. During events, there was loss of tactile sensitivity in the affected region. No family history had been referred.

At the time of onset of symptoms, laboratory tests were performed to rule out secondary causes. Inflammatory and immune-mediated diseases such as systemic lupus erythematosus and other rheumatologic diseases had been excluded. He was submitted to electrocardiogram and echodopplercardiogram. All these exams showed without significant changes. Figure 1 illustrates the vasomotor alteration presented in the report.



Figure 1: Clinical picture marked by cyanosis in the fingers after exposure to cold.

## DISCUSSION

Raynaud's phenomenon (RP), as described in 1862 by Maurice Raynaud, is characterized by reversible episodes of extremity vasospasms, associated with changes in typical coloring that occur after exposure to cold or in stress situations [4].

Color changes are classically described in three successive phases: paleness (ischemic phase), cyanosis (caused by venostasis and deoxygenation), and flushing (hyperemia reactive/reperfusion). Pain and/or paresthesia may also be associated with attacks, causing discomfort to the individual [5]. The patient in the present study shows his clinical condition only with the pallor of the fingers and superficial hypoesthesia (tactile and painful) [5].

Mainly in RP secondary to systemic sclerosis (SS), the vasospastic events are usually more intense and frequent, and often associated with ischemic ulcers. Additionally, progressive resorption of the extremities is the manifestation that does not occur in the present case. In recent years, advances in the study of the pathophysiology of the RP and vascular disease in SS, for example, led to the onset of new therapeutic options for this manifestation [6].

The average age of onset of primary RP is 14 years of age (as reported in the present case), and only 27% of cases start with around 40 years old or more. In contrast, the secondary RP tends to start in adulthood. The frequency and severity of episodes are influenced by daily temperature variations, with clear exacerbation during the winter and cold water [7].

The vascular tone is controlled by the interaction between endothelial cells, vascular wall smooth muscle, soluble mediators, and neuronal stimulation. An imbalance between vasoconstriction and vasodilation, favoring vasoconstriction, is a central event in the pathophysiology of RP; although part of this mechanism still has question gaps. Patients who present primary Raynaud's phenomena should only be instructed about the triggers for the beginning of the clinical process [5–7].

## CONCLUSION

In patients with primary RP, pharmacological treatment is generally not necessary, and non-drug measures such as patient education and protection from cold are sufficient. On the other hand, RP secondary to autoimmune rheumatic diseases will often require drug treatment. In these cases, the severity and associated complications must be evaluated and the treatment must be stratified for each case. We emphasize the need for differential diagnosis.

## REFERENCES

1. Temprano KK. A review of Raynaud's disease. *Mo Med* 2016;113(2):123–6.
2. Tomčík M. Raynaud's phenomenon. [Article in Czech]. *Cas Lek Cesk* 2016;155(6):310–8.
3. Ahrazoglu M, Moynzadeh P, Hunzelmann N. Differential diagnoses of Raynaud's phenomenon. [Article in German]. *Dtsch Med Wochenschr* 2014;139(20):1064–9.
4. Wigley FM. Clinical practice. Raynaud's phenomenon. *N Engl J Med* 2002;347(13):1001–8.
5. LeRoy EC, Medsger TA Jr. Raynaud's phenomenon: A proposal for classification. *Clin Exp Rheumatol* 1992;10(5):485–8.
6. Flavahan NA, Flavahan S, Mitra S, Chotani MA. The vasculopathy of Raynaud's phenomenon and scleroderma. *Rheum Dis Clin North Am* 2003;29(2):275–91, vi.

7. Herrick AL. Pathogenesis of Raynaud's phenomenon. *Rheumatology (Oxford)* 2005;44(5):587-96.

\*\*\*\*\*

**Author Contributions**

Marco Orsini – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Antônio Marcos da Silva Catharino – Analysis of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Valéria Camargo Silveira – Analysis of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Carlos Henrique Melo Reis – Analysis of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mauricio de Sant' Anna Junior – Acquisition of data, Analysis of data, Revising the work critically for important intellectual content, Final approval of the version to be

published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Carlos Eduardo Cardoso – Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

**Guarantor of Submission**

The corresponding author is the guarantor of submission.

**Source of Support**

None.

**Consent Statement**

Written informed consent was obtained from the patient for publication of this article.

**Conflict of Interest**

Authors declare no conflict of interest.

**Data Availability**

All relevant data are within the paper and its Supporting Information files.

**Copyright**

© 2021 Marco Orsini et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

Access full text article on other devices



Access PDF of article on other devices





INTERNATIONAL JOURNAL OF CASE REPORTS AND IMAGES



VIDEO JOURNAL OF CLINICAL RESEARCH



VIDEO JOURNAL OF BIOMEDICAL SCIENCE



INTERNATIONAL JOURNAL OF HEPATOBILIARY AND PANCREATIC DISEASES



INTERNATIONAL JOURNAL OF BLOOD TRANSFUSION AND IMMUNOHEMATOLOGY



EDORIUM JOURNAL OF OPHTHALMOLOGY



**Submit your manuscripts at**  
[www.edoriumjournals.com](http://www.edoriumjournals.com)



EDORIUM JOURNAL OF MEDICINE



EDORIUM JOURNAL OF CARDIOTHORACIC AND VASCULAR SURGERY



JOURNAL OF CASE REPORTS AND IMAGES IN ORTHOPEDICS AND RHEUMATOLOGY



EDORIUM JOURNAL OF PSYCHOLOGY



EDORIUM JOURNAL OF CELL BIOLOGY



JOURNAL OF CASE REPORTS AND IMAGES IN DENTISTRY



EDORIUM JOURNAL OF CANCER



EDORIUM JOURNAL OF PSYCHIATRY



JOURNAL OF CASE REPORTS AND IMAGES IN INFECTIOUS DISEASES



EDORIUM JOURNAL OF ANATOMY AND EMBRYOLOGY



EDORIUM JOURNAL OF SURGERY



JOURNAL OF CASE REPORTS AND IMAGES IN PATHOLOGY



EDORIUM JOURNAL OF ANESTHESIA