

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/radcr](http://www.elsevier.com/locate/radcr)

## Case Report

# A rapid caliber change in the inferior vena cava during multiphasic contrast-enhanced computed tomography may signal an acute anaphylactic reaction to nonionic contrast medium

Takayoshi Shinya<sup>a,\*</sup>, Akihiro Tada<sup>b</sup>, Yoshihisa Masaoka<sup>b</sup>, Nanako Ogawa<sup>a</sup>, Satoko Makimoto<sup>b</sup>, Hiroki Ihara<sup>b</sup>, Ryuichiro Fukuhara<sup>b</sup>, Noriaki Akagi<sup>b</sup>, Takao Hiraki<sup>b</sup>, Atsunori Nakao<sup>c</sup>, Susumu Kanazawa<sup>b</sup>

<sup>a</sup> Departments of Pediatric Radiology, Okayama University Hospital, 2-5-1 Shikatacho, Kitaku, Okayama 700-8558, Japan

<sup>b</sup> Departments of Radiology, Okayama University Hospital, 2-5-1 Shikatacho, Kitaku, Okayama 700-8558, Japan

<sup>c</sup> Departments of Emergency and Critical Care Medicine, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University, 2-5-1 Shikatacho, Kitaku, Okayama 700-8558, Japan

## ARTICLE INFO

## Article history:

Received 20 May 2018

Accepted 8 July 2018

## Keywords:

Inferior vena cava

Caliber change

Anaphylaxis

Contrast-enhanced computed tomography

Nonionic contrast medium

## ABSTRACT

Severe anaphylactic reactions to an intravenous nonionic iodine contrast medium (NICM) are uncommon but can result in permanent morbidity or death if not managed appropriately. An anaphylactic reaction to a NICM typically manifests as clinical symptoms that include an itchy nose, sneezing, and skin redness. To our knowledge, a rapid change in the caliber of the inferior vena cava (IVC) during multiphasic contrast-enhanced computed tomography (CT) has not been reported. Here, we report the computed tomographic findings in three cases of hypovolemic shock caused by an anaphylactic reaction to a NICM. We suspect that a decrease in caliber of the IVC during multiphasic contrast-enhanced CT may

Declarations of interest: None

\* Corresponding author.

E-mail addresses: [midnight-2005@nifty.com](mailto:midnight-2005@nifty.com) (T. Shinya), [tdakihiro@gmail.com](mailto:tdakihiro@gmail.com) (A. Tada), [yoshi-masaoka@okayama-u.ac.jp](mailto:yoshi-masaoka@okayama-u.ac.jp) (Y. Masaoka), [somethingscoming0875@gmail.com](mailto:somethingscoming0875@gmail.com) (N. Ogawa), [s\\_cogacoga@yahoo.co.jp](mailto:s_cogacoga@yahoo.co.jp) (S. Makimoto), [ihara.hiroki.0206@gmail.com](mailto:ihara.hiroki.0206@gmail.com) (H. Ihara), [ryuichirof@gmail.com](mailto:ryuichirof@gmail.com) (R. Fukuhara), [tanuki1115@yahoo.co.jp](mailto:tanuki1115@yahoo.co.jp) (N. Akagi), [takaoh@tc4.so-net.ne.jp](mailto:takaoh@tc4.so-net.ne.jp) (T. Hiraki), [qq-nakao@okayama-u.ac.jp](mailto:qq-nakao@okayama-u.ac.jp) (A. Nakao), [susumu@cc.okayama-u.ac.jp](mailto:susumu@cc.okayama-u.ac.jp) (S. Kanazawa).

<https://doi.org/10.1016/j.radcr.2018.07.002>

1930-0433/© 2018 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license. (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

be a predictor of an allergic-like reaction to an NICM. Patients in whom physicians and radiographers detect a rapid caliber change in the IVC during multiphasic contrast-enhanced CT should be managed carefully.

© 2018 The Authors. Published by Elsevier Inc. on behalf of University of Washington.

This is an open access article under the CC BY-NC-ND license.

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

## Introduction

Computed tomography (CT) with nonionic iodine contrast medium (NICM) is becoming an increasingly common radiologic examination worldwide. NICMs are generally considered safe, and adverse events are uncommon [1,2]. However, acute adverse reactions to these agents are important in clinical practice because they are unpredictable and uncomfortable for patients [3]. Anaphylactic reactions to intravenous NICMs range from mild flushing to cardiopulmonary arrest and occur in about 1% of patients [2,4]. During multiphasic contrast-enhanced CT, several of our patients have experienced a rapid change in the caliber of the inferior vena cava (IVC), suggesting hypovolemic shock caused by an anaphylactic reaction to an intravenous NICM. To the best of our knowledge, this rapid change in the caliber of the IVC during multiphasic contrast-enhanced CT in association with an anaphylactic reaction has not been reported. Here, we report three cases of hypovolemic shock and discuss their CT findings.

## Case reports

### Patient 1

A 68-year-old man with hepatocellular carcinoma and no history of allergy was referred for abdominopelvic CT (Aquilion Precision; Toshiba Medical Systems, Tokyo, Japan) and received an intravenous injection of 100 mL of non-ionic iodinated contrast material containing 300 mg I/mL at a rate of 3 mL per second. For bolus tracking, a region of interest was placed in the thoracoabdominal aorta junction, with a trigger set to start at 100 HU. Scanning was initiated 10 seconds later. The scanning was performed as follows: (1) unenhanced CT, (2) a bolus-triggered arterial phase, (3) 25 seconds after the start of the arterial phase acquisition (portal phase), and (4) 180 seconds after the start of the arterial phase acquisition (venous phase).

During multiphasic contrast-enhanced CT, the patient had several adverse reactions to the contrast medium, including cough, chest discomfort, and tachycardia. After the CT examination, the patient remained awake and alert despite having a low blood pressure (systolic 54 mmHg, diastolic unmeasurable). These symptoms resolved about 30 minutes later.

The caliber of the IVC had not decreased on the unenhanced, arterial, and portal phases (Figs. 1a–c) and had increased on the portal phase (Fig. 1c). However, the venous phase contrast-enhanced CT images showed that the IVC was flattened or diminished at the lower levels of the infrahepatic portion (Fig. 1d). There were no additional features of

hypoperfusion complex for reasons other than anaphylactoid shock [5,6], such as decreased enhancement of the viscera, increased mucosal enhancement and luminal dilatation of the small bowel, mural thickening and fluid-filled loops in the small bowel, a dense small-caliber aorta, intensely enhancing kidneys and mesenteric vasculature, the halo sign around the IVC, or peripancreatic edema. Dynamic contrast-enhanced magnetic resonance imaging performed four months later (not shown) did not reveal any abnormal findings in the IVC.

### Patient 2

A 64-year-old woman with renal cell carcinoma and no history of allergy underwent abdominopelvic CT (SOMATOM Definition Flash; Siemens AG, München, Germany) using the same protocol as in patient 1. During multiphasic contrast-enhanced CT, the patient had several adverse reactions to the contrast medium, including cough and generalized redness. After the examination, the patient could open her eyes on command despite having a low blood pressure (89/35 mmHg). These symptoms resolved about 20 minutes later. The caliber of the IVC had not decreased on the unenhanced, arterial, and portal phases (Figs. 2a–c) and had increased slightly on the arterial and portal phases (Figs. 1b and c). However, the contrast-enhanced CT images on the venous phase revealed that the IVC was flattened or diminished at multiple levels of the infrahepatic portion (Fig. 2d). Additional features of hypoperfusion complex [5,6] were not seen. Magnetic resonance imaging performed six months later did not reveal any abnormal findings in the IVC (not shown).

### Patient 3

A 68-year-old man with hepatocellular carcinoma and no history of allergy underwent abdominopelvic CT (SOMATOM Definition Flash) using the same protocol as in patient 1. During multiphasic contrast-enhanced CT, the patient had several adverse reactions to the contrast medium, including an itchy nose, sneezing, and skin redness. After the examination, the patient remained awake and alert despite having a low blood pressure (79/46 mmHg). These symptoms resolved about 5 minutes later. The caliber of the IVC had not decreased on the unenhanced and arterial phases (Figs. 3a and b) and had increased on the arterial phase (Fig. 1b). However, the portal and venous phase contrast-enhanced CT images revealed that the IVC was flattened or diminished at the level of the infrahepatic portion (Figs. 3c and d). No additional features of hypoperfusion complex [5,6] were seen. Magnetic resonance imaging performed seven months later (not shown) revealed no abnormalities in the IVC.

Download English Version:

<https://daneshyari.com/en/article/8824938>

Download Persian Version:

<https://daneshyari.com/article/8824938>

[Daneshyari.com](https://daneshyari.com)