
Pseudoventricular tachycardia due to a silicone tourniquet

Dear Editor,

Electrocardiographic artifacts can occur during general anesthesia, for example, due to electric scalpels. While anesthesiologists often encounter the latter, some medical equipment, such as cardiopulmonary bypass (CPB) and continuous venovenous hemodiafiltration (CVVH), can also occasionally cause artifacts.^[1] Here, we report a case of pseudoventricular tachycardia (VT) due to an electrostatically-charged silicone tourniquet, which, to the best of our knowledge, has not been described previously.

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

A 9-year-old girl underwent general anesthesia with standard monitoring, including pulse oximetry and electrocardiography (ECG), when the ECG suddenly indicated VT before intravenous access had been established during anesthesia induction [Figure 1a]. Due to an artifact, pseudoVT was suspected because pulse wave oximetry was normal. Subsequently, we realized that



Figure 1: Pseudoventricular tachycardia during anesthetic induction. (a) Electrocardiography indicates ventricular tachycardia, although pulse wave oximetry shows normal findings (This image was recorded after induction of anesthesia). (b) A silicone tourniquet (eastsidemed, Inc., Tokyo, Japan)

such pseudoVT occurred only when an anesthesiologist preparing to establish intravenous access swung a silicone tourniquet while standing beside the patient (Figure 1b, Eastsidemed Inc., Tokyo, Japan). The waveform also appeared to show atrial flutter (AF) and supraventricular tachycardia (SVT). This phenomenon was observed repeatedly with other patients in other operating rooms at our institution and also at the other institution, this phenomenon disappeared later, as the silicone tourniquets were coated with an antistatic spray (Eleguard; Lion Co., Tokyo, Japan). Thus, the cause of the pseudoVT was identified as the rhythmic movement of the electrostatically charged silicone tourniquet.

While electrocardiographic artifacts due to electric scalpels can occur during general anesthesia, anesthesiologists rarely misdiagnose them as arrhythmia. However, electrocardiographic artifacts due to static electricity caused by friction between the roller pump and circuit of the CPB and CVVH during their rhythmic movement can be fairly easily misdiagnosed as arrhythmia.^[2,3] Similarly, abnormal electrical stimulus from an intraaortic balloon pump leading to a misdiagnosis has been described previously.^[4]

We describe a case of pseudoVT due to the proximity of an electrostatically-charged silicone tourniquet during induction of general anesthesia. Although swinging a tourniquet right next to a patient is an ethically problematic practice, this phenomenon has implications for anesthesiologists. Silicone tends to generate static electricity upon friction with air, and this phenomenon also occurs under cool and dry circumstances,^[2] such as during winter in Japan, when the described incident occurred. The electrocardiographic artifact in our case covered the QRS wave and manifested as a VT-like waveform because an anesthesiologist swinging the silicone tourniquet was standing right next to the patient. This artifact can also appear as an AF- or SVT-like waveform,

depending on movement patterns of tourniquet and the distance between the patient and the electrostatically charged silicone tourniquet. Therefore, misdiagnoses and inappropriate interventions in such situations, namely, administration of an antiarrhythmic agent or electrical defibrillation, can be avoided by confirming if pulse wave oximetry patterns and arterial palpation findings concur with those seen on the ECG.

In summary, care must be taken when using electrostatically charged products, such as silicone, and doctors must be aware of their effects on medical equipment, as many silicone products are used in patients with latex allergy.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient's parents have given her consent for her images and other clinical information to be reported in the journal. The patient's parents understand that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

HIDEKAZU ITO, SHOJI MIZUNO, KENJI IIO

Department of Anesthesiology, Aichi Developmental Disability Center Central Hospital, 713-8 Kagiya-cho, Kasugai-city, Aichi 480-0392, Japan

Address for correspondence:


Dr. Hidekazu Ito,
Department of Anesthesiology, Aichi Developmental Disability Center Central Hospital, 713-8 Kagiya-cho, Kasugai-city, Aichi 480-0392, Japan.
E-mail: oniheizo1745@gmail.com

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