



CASE REPORT

Recipient sepsis caused by *Lactococcus garvieae* contamination of platelets from a donor with colon cancer

Shuichi Nakamura,¹  Kenji Nakai,¹  Momoko Sakata,¹ Yoshio Nagaoka,¹ Kozue Yoshida,² Uichiro Katsumata,² Toshimi Chiba³ & Keiji Matsubayashi⁴

¹Iwate Red Cross Blood Center, Morioka-shi, Japan

²Iwate Prefectural Isawa Hospital, Oshu-shi, Japan

³Internal Medicine of Dentistry, Iwate Medical University, Morioka-shi, Japan

⁴Central Blood Institute, Blood Service Headquarters, Japanese Red Cross Society, Tokyo, Japan

Vox Sanguinis

Lactococcus garvieae is a well-known fish pathogen that has low virulence in humans and is rarely isolated from the blood cultures of endocarditis patients. We describe herein the first reported case of transfusion-transmitted *L. garvieae* sepsis caused by a contaminated platelet concentrate from a donor who consumed raw octopus before blood donation. Retrospective examination of the laboratory results of the index donor revealed that his haemoglobin levels had been steadily decreasing, which led to the detection of a latent colon cancer. The donors with colon lesions involving a latent cancer may relate an asymptomatic bacteremia.

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Case presentation

An 81-year-old man had myelodysplastic syndrome. In the laboratory tests before transfusion, his white-blood-cell count was 2,810/ μ l and his haemoglobin concentration was 9.7 g/dl. The number of platelets was as low as 14,000/ μ l. One unit of irradiated platelet concentrate (PC) that was prepared by single-donor plateletpheresis using a Terusys-S system (Terumo BCT, Co., Ltd., Tokyo, Japan) was transfused to the patient on day 2 after blood collection. This PC component was confirmed to have no abnormalities by visual inspection at the blood centre and again at the bedside just before starting the transfusion.

The patient's clinical course is shown in Fig. 1. There was no abnormality in vital signs before and 5 and 15 minutes after the initiation of PC transfusion. Two hours and 40 min after transfusion, aggregates were found in the infusion tubing and in the integral sealed segment of the PC bag; the transfusion was thus stopped. Gram-

positive bacteria were detected in the integral sealed segment of the PC bag, and patient blood culture was performed at the hospital microbiology service. Approximately 5 h after transfusion, the patient had a body temperature of 39.8°C. Six hours after transfusion, he had faecal incontinence and decreased blood pressure. Subsequently, ceftriaxone sodium hydrate and meropenem hydrate therapy were administered. The following day, his vital signs returned to normal and antibiotic treatment was continued for 1 week.

Lactococcus garvieae was isolated from both the PC residues and the patient blood at another clinical laboratory centre. The DNA restriction profiles from pulsed-field gel electrophoresis (PFGE) using restriction enzymes *Apal* and *SmaI* revealed that the strain isolated from the patient blood had the same DNA fragment pattern as the strain from the PC residues, and the two were thus considered to be the same strain.

An interview survey of the blood donor indicated no history of valvular heart disease. The donor had consumed octopus sashimi, but not raw fish, 5 days before blood donation. There was no sign of fever, malaise or diarrhoea from the day before blood donation to 2 days after.

Correspondence: Kenji Nakai, Iwate Red Cross Blood Center, 6-1-6

Sanbonyanagi, Morioka-shi, Iwate, 020-0831, Japan

E-mail: k-nakai@iwate.bc.jrc.or.jp

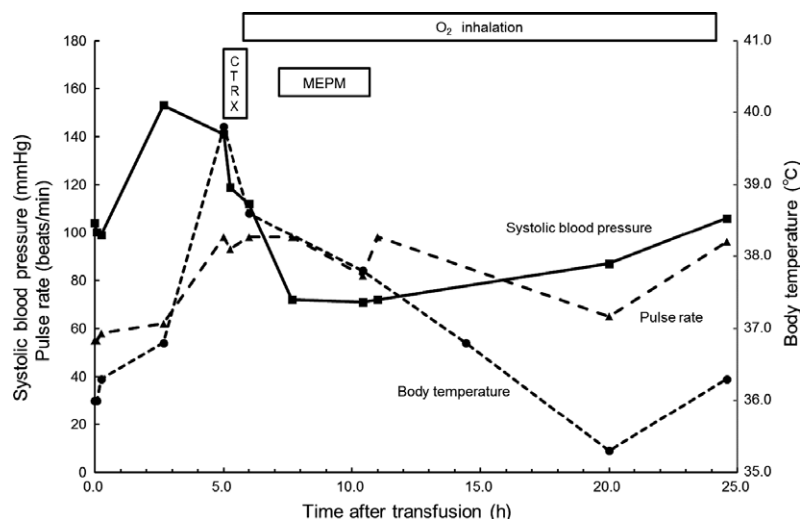


Fig. 1 Clinical course of the patient. At 2 h and 40 min after one unit of PC was transfused, aggregates were found, and transfusion was stopped. Gram-positive bacteria were detected in the infusion tube and in the integral sealed segment of the bag. After 5 h, the patient developed a fever and antibiotic treatment was administered. Thereafter, oxygen was administered due to decreasing SpO₂. The patient's vital signs returned to normal the next morning. CTRX: ceftriaxone sodium hydrate; MEPM: meropenem hydrate.

The laboratory findings of the blood donor at the most recent 3-month follow-up showed marked decreases in the haemoglobin concentration (from 15.2 g/dl to 12.2 g/dl), haematocrit (from 45.9% to 38.7%) and mean corpuscular volume (from 86.0 fl to 78.3 fl).

A medical institution was consulted and endoscopic examination of the donor revealed a tumorous lesion in the sigmoid colon, and the donor was diagnosed as having advanced cancer of the descending colon (Stage IIa). Endoscopic-assisted colectomy and lymph node dissection at the root of nutrient vessels were performed. After surgery, the donor recovered and is currently being followed up at an outpatient hospital.

Discussion

We report for the first time in the world a case of *L. garvieae* infection resulting from a platelet transfusion. *L. garvieae* is known to be the causative bacterium of bovine mastitis and fish sepsis in fish farms. It is rarely isolated from human blood cultures as a causative bacterium of invasive diseases, such as endocarditis [1]. Kozakai *et al.* first reported the isolation of *L. garvieae* from blood products [2]. It is customary to eat raw seafood in Japan, and it was previously reported that 49 out of 135 faecal specimens were positive for *L. garvieae* by polymerase chain reaction analysis in Japan [3]. In 2015, Fichi *et al.* reported the first isolation of *L. garvieae* from octopuses collected in Italy [4]. We speculated that *L. garvieae* may have entered the bloodstream of the donor from the colon lesion. Castro *et al.* previously

reported bloodstream infections due to bacterial co-infections in patients with rectal carcinoma [5]. In our case, the bacterial infection in the recipient occurred after PC transfusion, and the *L. garvieae* strain detected in the patient blood had the same PFGE pattern as the strain from the index PC bag. Little is known about the genetic variability between strains of *L. garvieae* that infect human and fish. However, the *L. garvieae* strains isolated from blood donors in Japan can be discriminated by PFGE (data not shown). Taken together, these data suggest that this was a case of transfusion-transmitted *L. garvieae* bacteremia.

Although bacterial screening of blood products with the BacT/ALERT system was introduced in the United States (US) in 2004, it cannot completely prevent transfusion-related bacterial infections. According to a US Food and Drug Administration (FDA) report, there are approximately 2.1 million PC transfusions annually, and 13 deaths due to bacterial contamination occurred from 2011 to 2015 [6]. In 2016, the US FDA announced guidelines (draft) for mitigating of sepsis caused by platelet transfusions; they included methods for pathogen reduction and for point-of-care bacterial detection [7]. In Japan, the shelf life of blood products is set shorter than in other countries [8]. However, ten cases of bacterial infection still occurred from 2007 to 2016, and they were all caused by contaminated PCs. While general inquiries at the time of donation are important, it is difficult to detect latent lesions. In this case, progressive microcytic anaemia was observed in the donor by retrospectively examining the test results of his past donations, and

fortunately led to the detection of the latent gastrointestinal tumour. The donors with colon lesions may relate an asymptomatic bacteremia.

Conflict of interest

The authors have no conflict of interest to disclose.

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