

## Acute renal failure with severe loin pain after anaerobic exercise (ALPE): detection of patchy renal ischaemia by contrast-enhanced colour Doppler

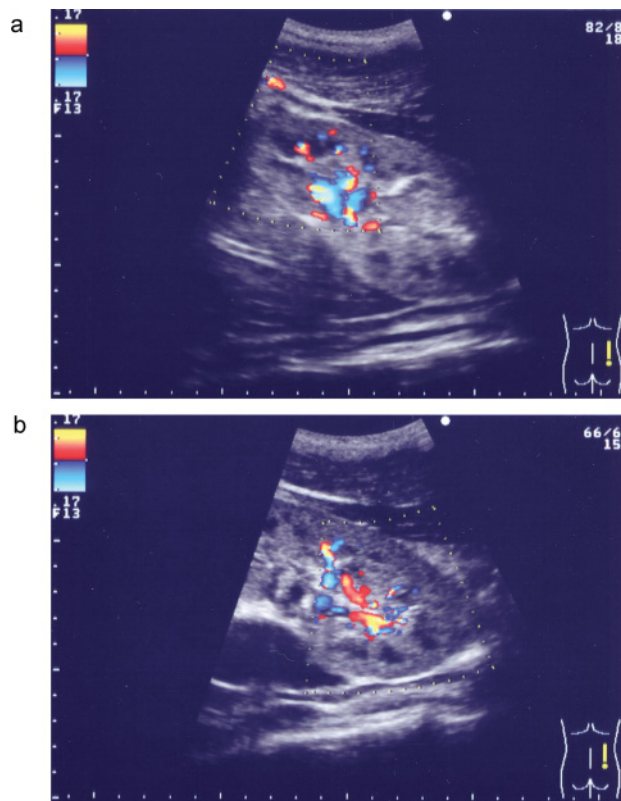
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An 18-year-old Japanese boy developed a severe loin pain 6 h after performing a 200 m dash three times in a baseball training, and was admitted to our hospital. He had a history of acute renal failure with severe loin pain after anaerobic exercise (ALPE) following the same kind of exercise 2 years before. On admission, his serum creatinine (Cr) level was 292  $\mu\text{mol/l}$  (3.3 mg/dl) without accompanying findings of rhabdomyolysis-like elevation of creatine phosphokinase or myoglobinuria. Renal stones were not detected either by plain abdominal X-ray or by sonography. Accordingly, a diagnosis of ALPE was made. We started hydration and pain control by pentazocine without using non-steroidal anti-inflammatory drugs (NSAIDs).

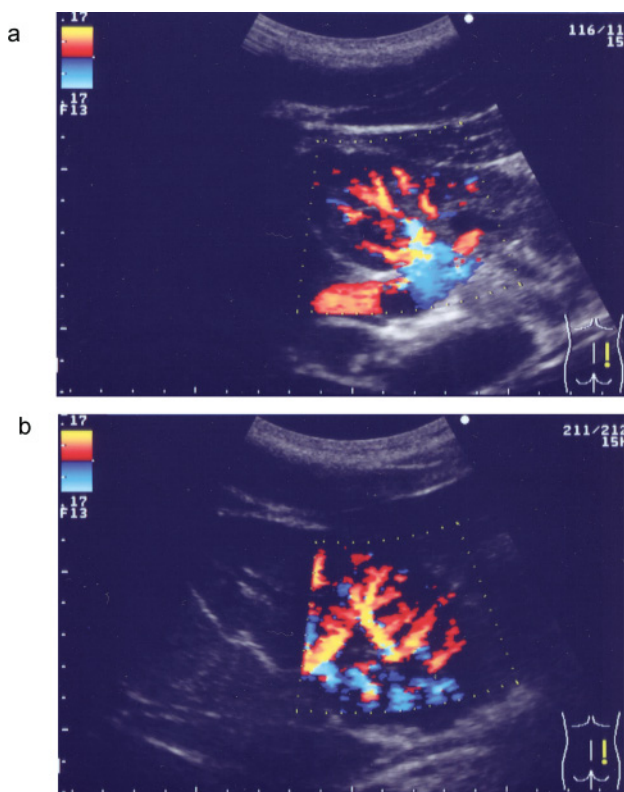
ALPE [1] is an uncommon syndrome, which mainly occurs in Asians possibly because of the relatively high prevalence (0.15–0.6%) of renal hypouricaemia [2,3,4]. The pathogenesis of ALPE is not clearly understood, but is considered to be a severe arterial vasoconstriction in the kidney. ALPE is known to demonstrate patchy wedge-shaped defects by contrast media-enhanced computed tomography (CT) or magnetic resonance imaging (MRI) in delayed phase, which are considered to reflect renal ischaemia caused by vasospasm [5].  $^{99\text{m}}\text{Tc}$ -methylene diphosphonate (MDP) bone scintigraphy is also helpful to diagnose ALPE and to detect its ischaemic regions [6]. However, it requires time to start and to perform these imaging tests, and besides, contrast media for CT or MRI may cause harm, especially to patients with impaired renal function. Thus, we attempted to detect ischaemic regions caused by ALPE with colour Doppler imaging, which is non-invasive and can be implemented at any time and at the patients' bedside. The use of micro-bubble contrast agent



**Fig. 1.** Contrast-enhanced colour Doppler of ALPE on admission (acute phase). Perfusion defects were found both in the upper pole (a) and in the lower pole (b) of the kidney.

Levovist™ (99.9% galactose and 0.1% palmitic acid; Bayer Schering Pharma, Berlin, Germany) enhanced visualization of vascularity [7]. After intravenous injection of Levovist, micro-bubbles increased the backscattered signal intensity and therefore improved the Doppler analysis [8]. In several sections of the bilateral kidney, non-perfused areas were delineated (Figure 1a and b).

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**Fig. 2.** Contrast-enhanced colour Doppler of ALPE on the 14th day (recovery phase). Perfusion defects were no longer observed, either in the upper pole (a) or in the lower pole (b) of the kidney.

Twenty-four hours later, his loin pain disappeared.

On the 8th day, he was discharged because his Cr level decreased to 97  $\mu\text{mol/l}$  (1.1 mg/dl) without dialysis therapy.

On the 14th day, his Cr level recovered to 71  $\mu\text{mol/l}$  (0.8 mg/dl) and a follow-up contrast-enhanced colour Doppler was performed. Compared with the former examination, defects of Doppler signals were no longer observed (Figure 2a and b), and both high-intensity echo and swelling of the kidney were ameliorated.

In ALPE, contrast-enhanced colour Doppler might be useful in its diagnosis and follow-up.

*Conflict of interest statement.* None declared.

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