

Bilateral brachial rhabdomyolysis caused by push-up exercise

Taku Suzuki,^{1,2} Takashi Kuroiwa,¹ Katsuji Suzuki,¹ Harumoto Yamada¹

¹Department of Orthopaedic Surgery, Fujita Health University, Toyoake, Aichi, Japan
²Department of Orthopaedic Surgery, Keio University School of Medicine, Shinjuku-ku, Tokyo, Japan

Correspondence to

Dr Taku Suzuki,
taku19781109@gmail.com

Accepted 26 April 2017

DESCRIPTION

A 15-year-old girl presented with an increased swelling bilaterally of her upper arms. Six days before presentation, she performed 50 push-up exercises for the first time in her life. On clinical examination, there was a slight pain and limited range of motion of the shoulder and elbow due to severe swelling of her upper extremity. MRI on T2-weighted sequences showed an increased signal intensity of the medial and lateral heads bilaterally of the triceps brachii, whereas the long heads were intact (figures 1 and 2). Laboratory testing showed elevated creatine kinase (CK) level of 6616 mU/mL and no myoglobinuria. She was diagnosed with rhabdomyolysis and soon admitted for rest and treated by hydration with saline. After 7 days, swelling of her upper arm improved with full range of motion and normal CK level.

Rhabdomyolysis is sometimes induced after excessive muscular activity.¹ Push-ups are repetitive exercises performed in a prone position by raising and lowering the body using the arms. Up-phase involves a combination of elbow extension and shoulder flexion, and down-phase involves a combination of elbow flexion and shoulder extension. The medial and lateral heads of the triceps brachii are monoarticular muscles, whereas the long head is biarticular. Biarticular muscle is simultaneously extended and contracted in the motion of the shoulder and elbow. However, length of the monoarticular muscle is affected by elbow motion only during push-up exercises. Because lengths

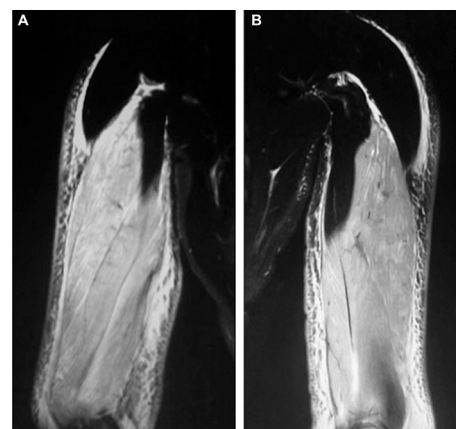


Figure 2 Increased signal intensity bilaterally on coronal views of the medial and lateral heads of the triceps brachii (A, right; B, left).

Learning points

- ▶ The medial and lateral heads of the triceps brachii are sometimes selectively damaged due to push-up exercises.
- ▶ Rhabdomyolysis may be induced by push-up exercises.

of monoarticular muscle change significantly compared with the biarticular muscle, the medial and lateral heads can be selectively damaged.

Contributors TS and TK were the primary clinicians responsible for the patient's care. TS and TK were responsible for the conception of the report and searched the scientific literature. TS wrote the report, and TS was responsible for critical revision. HY and KS took overall responsibility.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Zutt R, van der Kooij AJ, Linthorst GE, et al. Rhabdomyolysis: review of the literature. *Neuromuscul Disord* 2014;24:651–9.

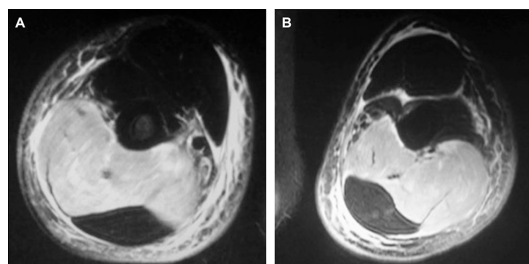


Figure 1 Increased signal intensity bilaterally on axial views of the medial and lateral heads of the triceps brachii (A, right; B, left).



To cite: Suzuki T, Kuroiwa T, Suzuki K, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2016-219171

Copyright 2017 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow