

Muscle injury following laparoscopic appendectomy

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To the Editor:

We describe a rare case of position-related muscle injury in a previously healthy 13-year-old boy (height 155 cm; weight 45 kg) undergoing laparoscopic appendectomy. The surgery was performed in supine position with the patient under general anesthesia and thoracic epidural analgesia. Duration of the laparoscopic procedure was 78 min. Patient positioning was in a head-down position as great as 30°. We carefully monitored the patient's position to avoid compressing his body. After emerging from anesthesia, he did not complain of surgical site pain or hip pain. However, he complained of severe left hip pain after 6 h. The hip appeared to be swollen and tender. On post-operative day 3, magnetic resonance imaging did not indicate other serious diseases, such as necrotizing fasciitis or rhabdomyolysis (Supplementary Fig. 1). The muscle pain was improved by conservative therapy.

Despite full-scale preparations for minimizing risk, position-related muscle injury occurred in a healthy pediatric patient. When a patient is in the head-down position,

maintenance of limb perfusion is important to avoid position-related soft tissue injury [1]. Estimating from a simple model in a head-down position of 30° (Supplementary Fig. 2), blood pressure around the hip drops about $1/5.44 \times (\text{height, cm}) \text{ mmHg}$ compared to that of the head. In pediatric cases, this pressure gradient could have a bad influence on limb perfusion because the normal blood pressure in children is lower than in adults. Additional intermittent measurement of blood pressure at the lower extremity could be effective for monitoring limb perfusion. If blood pressure in the lower extremity cannot be maintained, the anesthesiologist should consider intermittent reversal of the head-down position or limiting the duration of that position.

Reference

1. Halliwill JR, Hewitt SA, Joyner MJ, Warner MA. Effect of various lithotomy positions on lower-extremity blood pressure. *Anesthesiology*. 1998;89:1373–6.

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