

## *Letters to the editor*

### **Abnormal rigidities of the muscles and joints of the lower limb induced by a short-term, low-pressure tourniquet**

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*To the editor:* We report a case of abnormal rigidities of the muscles and joints of the lower limb induced by a tourniquet.

A 36-year-old man was scheduled for arthroscopic surgery under spinal anesthesia. Ten minutes after injection of 2.6 ml of 0.24% dibucaine from the L<sub>2-3</sub> interspace, analgesia to the Th<sub>11</sub> level was obtained, and this level was almost unchanged until the end of operation. Thirty minutes after injection, an envelope-type cuff was applied after an esmarch bandage at the middle part of the thigh with a pressure of 240 mmHg. Sixty minutes after inflation of the tourniquet, just before the end of the operation, the patient complained of severe pain at the posterior site of the knee. The tourniquet was deflated immediately. Abnormal rigidities of the knee and ankle joints and the muscles of the limb distal to the tourniquet were noticed.

Massive swelling of the limb was also noticed. Some hypodermal exudates appeared and increased in number at the affected limb. The toes were pale, and blood flow in the affected leg was not detected by a Doppler flowmeter. The patient continued to complain of severe pain and hypesthesia, as during inflation of the tourniquet. With oxygen inhalation, we started massage of the muscles of the affected leg with a wave-formed peripheral circulation-promoting device (Hadomer, Konishi-Iryoki, Osaka, Japan). Muscle rigidity and swelling decreased gradually and the dorsal pedis artery became palpable 25 min after release of the tourniquet. Pain decreased as other symptoms attenuated. Seventy-five min-

utes after release of the tourniquet, when the blood flow of the affected limb and the patient's symptoms had improved, the patient was transferred to the ward. Although we did not measure compartment pressures, the symptoms and clinical signs strongly suggested that compartment syndrome (CS) had occurred transiently. In CS the rise in intracompartmental pressure induced by various causes brings about circulation failure resulting in muscle tamponade and myoneural necrosis. However, only a few case reports of CS induced by a tourniquet are available. We found only one case report of transient CS of the forearm induced by a tourniquet [1]. In that case the tourniquet pressure was 300 mmHg and the tourniquet time was 95 min. Hirvensalo et al. reported two cases of CS of the lower limb caused by tourniquets [2]; their tourniquet pressures were 350 and 460 mmHg, and their tourniquet times were 85 and 43 min. Although there are no clear suggestions for safety limits for tourniquet pressure and tourniquet time, the complication occurred even though the tourniquet was used according to the generally accepted pressure and time. The symptoms of our patient ceased to progress before they became serious. But if the tourniquet time had been longer under general anesthesia, more invasive treatment might have been needed. In conclusion, there is a possibility that even a short-term low-pressure tourniquet may cause an unexpected complication.

### **References**

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2. Hirvensalo E, Tuominen H, Lapinsuo H, Hellio H (1992) Compartment syndrome of the lower limb caused by a tourniquet: a report of two cases. *J Orthop Trauma* 6(4):469-472

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