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Case report

## Acute bilateral compartment syndrome of the thigh induced by spinning training

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### 1. Case report

A 49-year-old man, was admitted in the emergency room of our hospital complaining of pain and swelling of the thighs; he had performed a particular exercise for 1 h, about 48 h before in a fitness centre. This exercise was the so-called “spinning”, a relatively new fitness activity, which consist of group static fast cycling. He was used to training regularly, but had never performed spinning before.

He noticed a brownish discoloration of his urine about 12 h after the end of the exercise. He had used no medications and had no history of previous relevant diseases. Both thighs were extremely tender to palpation. Neurological examination did not show any abnormalities. On admission the creatinine level was 1.5 mg/dl (NR 0.5–1.2); serum glutamic-pyruvic transaminase level was 592 U/l (NR 4–41); serum glutamic-oxaloacetic transaminase level was 2546 U/l (NR 0–38); creatine phosphokinase level was 185600 U/l (NR 5–190); and lactic dehydrogenase level was 8840 U/l (NR 240–480).

Compartment pressures were measured using a Stryker STIC monitor. The needles were placed anteriorly, in the rectus femoris, vastus medialis and vastus lateralis, and posteriorly, in the flexor muscles. The pressure of the anterior compartment was 70 mmHg in the left thigh and 45 mmHg in the right, while the pressure of the posterior and medial compartments was normal.

On the basis of the clinical observation and the laboratory and instrumental exams, a diagnosis of acute bilateral anterior compartment syndrome of the thigh was made: rehydration and forced alkaline diuresis were immediately initiated. The patient was taken to the operating theatre for a bilateral fasciotomy: a lateral incision was made on

each thigh, about 25 cm in length, deep into the fascia lata; epymiotomia was performed along the skin incision. The quadriceps appeared macroscopically tense, oedematous and slightly pale. The wounds were packed open.

The laboratory exams performed 1 and 5 days post-operatively showed improvement of renal function and a reduction of the cellular catabolites (Fig. 1).

On the 12th post-operative day the muscular oedema was almost completely resolved, and the wounds were closed. The patient was discharged 4 days later to begin physical therapy. At this time the patient was able to walk about 100 m without supports. One year later, we performed a follow-up visit and MRI. The patient had begun practicing sports again without any complaints. There was a mild contracture of both the surgical wounds. The MRI showed a fibrotic area of 5 cm in diameter in the right rectus femoris in its lateral portion. There were no abnormal findings in the left side.

### 2. Discussion

While muscle overuse is frequently involved in the pathogenesis of chronic compartment syndromes of the leg and the arm, it is exceptionally reported as the cause of acute compartment syndrome, particularly in the thigh: the width of the compartments in this region allows for a relevant swelling of the muscular tissues, before circulatory damages onset. In this case the vigorous exercise brought to necrosis of muscular cells (i.e. rhabdomyolysis) inducing oedema and augmentation of compartmental pressure.

We found in literature eight more cases of acute compartment syndrome of the thighs induced by overexertion (Table 1). Noteworthy is the fact that all the cases regard male patients, and that three cases were reported during the year 2000.

The case we report was induced by the practice of a relatively new fitness activity, the spinning: this is a program

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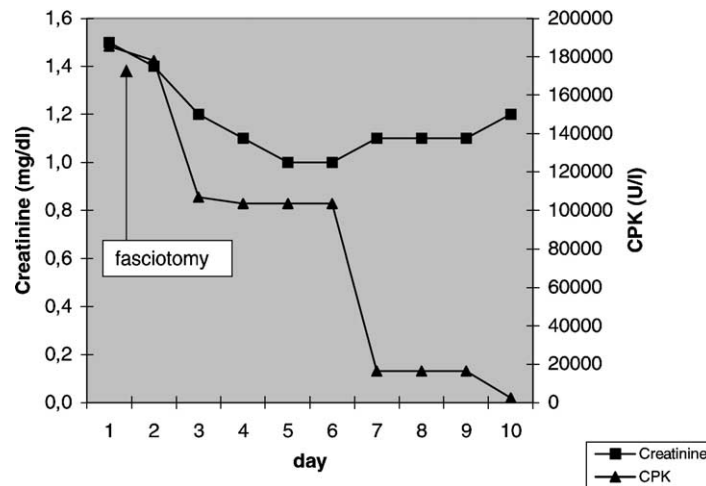


Fig. 1. Creatinine and CPK blood levels.

Table 1  
acute compartment syndrome of the thigh induced by overexertion in the literature

|                     | Year | M/F  | Monolateral/bilateral              | Age     | Kind of exercise |
|---------------------|------|------|------------------------------------|---------|------------------|
| Lonka et al. [4]    | 1987 | Male | Bilateral, thighs and legs (fatal) | 27      | Marathon running |
| Kahan et al. [2]    | 1994 | Male | Bilateral                          | 27      | 200 squats       |
| Presnal et al. [6]  | 1995 | Male | Monolateral                        | Unknown | Unknown          |
| Bidwell et al. [1]  | 1996 | Male | Monolateral                        | 16      | Weight training  |
| Wise et al. [8]     | 1997 | Male | Bilateral                          | 28      | Weight lifting   |
| Nau et al. [5]      | 2000 | Male | Monolateral                        | 51      | Weight training  |
| Kuklo et al. [3]    | 2000 | Male | Bilateral, thighs and legs (fatal) | 33      | Timed 2 mile run |
| Robinson et al. [7] | 2000 | Male | Bilateral                          | Unknown | Weight lifting   |

of indoor exercising that uses stationary cycles with a fix gear and a heavy flywheel. This kind of exercise submits the muscles, in particular the quadriceps, to relevant fatigue: this may explain the isolated involvement of the anterior compartment of the thighs in this patient.

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