Letter to the Editor

Comment on “Postoperative creatine kinase elevation following hip arthroscopy and associated risk factors”

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Dear Editor,

We read with great interest the recent article titled “Postoperative creatine kinase elevation following hip arthroscopy and associated risk factors” by Tonotsuka H [1]. This retrospective study investigated the postoperative creatine kinase (CK) and risk factors for CK elevation after hip arthroscopy. Their findings suggested that CK levels should be monitored, especially in young patients and cases of prolonged duration of traction during hip arthroscopy. We really appreciated the work that has been done by the authors. However, there are some worthwhile issues we like to comment on.

The authors stated that patients with any risk factors which considered to cause increase CK within 3 months before surgery were excluded in this study and all the procedures were performed under combined general and spinal anesthesia. However, the use of narcotic drugs and muscle relaxants during surgery are not mentioned. Many studies suggested that narcotic drugs and muscle relaxants may cause CK raise in the short term after surgery [2-4]. In our clinic, succinylcholine is commonly used for rapid sequence induction and is unrivaled in terms of high-speed impact, excellent muscle relaxation and creating ideal conditions for tracheal intubation. While, it is believed that muscle fibers damage due to depolarization occurs before they suffer paralysis after injection of succinylcholine [2, 3]. Irreversible changes in delicate muscle spindles or non-coordinated contractions of muscle fibers lead to cracking of connective tissues, CK raise and postoperative myalgia [2]. Additionally, in order to facilitate traction and reduce the traction force, muscle relaxants were also used during surgery. Therefore, the information about the drugs used by anesthesiologist in this study is insufficient.

Traditionally, serum CK measurements remain the best marker to determine and monitor skeletal muscle damage. Although CK is the most sensitive enzyme marker of skeletal muscle damage, it is not ideal for various reasons such as lack of specificity and an inability to distinguish damage between skeletal, smooth or cardiac muscle fibers [5]. Previous study suggested that muscle damage caused by direct trauma leads to increase the serum levels of lactate dehydrogenase (LDH), myoglobin (Mb), CK and muscle cytosolic form CK (MM-CK) [6]. So, we do recommend other measurements being monitored in the study.

Younger age and longer duration of traction were identified as independent risk factors for CK elevation. It is no doubt that high-pressure traction is necessary during the procedure in younger patients because of their larger muscle mass [7]. However, longer duration of traction and surgery represent more procedures need to be performed during surgery. As showed in Table 3, both the FAI and OA groups had significantly higher levels than the other group. We think these differences may cause by different procedures. Acetabular rim trimming, labral repair and femoral osteoplasty are mostly performed in FAI group. While, labral debridement, osteophyte removal and osteochondroplasty are mostly performed in OA group. When compared with the other group, more procedures may cause more soft-tissue damage. Therefore, the correlation between CK elevation and various procedures that probably affect CK should be considered.

In addition to the three limitations mentioned in the article, there is no control group in this study. Whether CK raises under the same condition of traction without surgical procedures being performed is unknown.

We respect the great contributions of the authors. The aim of this study tells us the level of CK should be monitored in young patients and those require a longer duration of traction after hip arthroscopy. We also look forward to the authors’ response to these issues we have pointed out.

References
Author's response:

First of all, we would like to express our appreciation to the author for their interest in our paper.

As the author pointed out, narcotic drugs and muscle relaxants can cause creatine kinase (CK) elevation. However, we do not use muscle relaxants during hip arthroscopy in our hospital. Instead, anesthesiologists routinely use spinal anesthesia in addition to general anesthesia. By using spinal anesthesia, we can induce ideal muscle relaxation just as with succinylcholine. The only narcotic drug we use is fentanyl for induction of anesthesia; after that, no additional narcotic drug is used. We use fentanyl for every patient in the same way, and basically, we do not use other narcotic drugs. Therefore, we believe the influence of narcotic drugs on CK elevation was minimal in our study.

No patients in this study had cardiac symptoms postoperatively. As this was a retrospective study, we do not have data on CK isoenzymes and other related markers. Generally, hip arthroscopy includes several procedures. Patients in the femoroacetabular impingement group mainly underwent labral repair and femoral osteoplasty, and those in the osteoarthritis group underwent labral debridement and osteophyte removal. However, the duration of each procedure varied widely, even in the same group. In this study, we did not perform analysis taking into account the duration of each procedure because the number of patients was too small. Further study is needed to clarify this point.

As the author notes, setting a control group with the same conditions of traction without surgical procedures would be quite effective for determining whether traction is a risk factor for CK elevation. Although such a control would be difficult to set, this point can be considered a limitation of this study.

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