

Sport Climbing: Medical Considerations for this New Olympic Discipline

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Abstract:

Since the recent announcement that Sport Climbing was selected to be part of the next Summer Olympic Games in 2020, climbers around the world are eager to see their sport on the most world-renowned athletic stage. This landmark decision reflects a huge worldwide interest and enthusiasm for the relatively young sport of climbing. We would like to recommend a cautious and informed approach to establishing this sport as part of the Olympic program. Many publications have proven the health promoting effects and overall low injury hazard in sport climbing. However, the modern competition format and training methods in elite climbers have changed, and we now see a wider spectrum of climbing related injuries than in the past.

Modern competition climbs require the use of arms, legs, hands and feet to perform far more strenuous and complex movements than before, leading to new forms of injuries like heel-hook related injuries, hamate fractures or bone marrow edema of the hands, to name a few. These newly identified injury patterns will become more prevalent with increasing numbers of high-level athletes in the sport. Additionally, if current trends continue, the average age of elite climbers participating in international competition will continue to decrease over the next several years. This expected decrease in the average athletes' age, will likely be accelerated by the introduction of sport climbing into the Olympic program. Already, we are seeing world-record-breaking ascents being performed regularly by adolescent climbers, both on rock, and in competition. Unfortunately, adolescence is a highly vulnerable period for these young athletes, during which time high intensity training can result in sport-specific injuries.

The first Olympic climbing competition will be designed as a combination of the three climbing sub-disciplines. Until now, these three forms of climbing were dominated by specialist climbers, as the different forms require totally different skill-sets. Retraining of the current specialist elite climbers to become competitive in all three disciplines of climbing will be a challenge. It remains to be seen how the national climbing federations worldwide will modify their athlete development programs in order to produce potential Olympic gold medalists.

We therefore highly recommend:

- a) More careful, evidence-based, sports-specific medical supervision of elite sport climbers.
- b) Monitoring of training and competition facilities, to ensure the use of more ergonomic, less injury inducing climbing holds, careful route setting and consideration of age-specific factors in the development and implementation of new training programs. By that, we can ensure that the new breed of elite (and recreational) climbers will continue to develop in a safe and effective sporting environment.

Key Words: Olympics, world cup, injury

Résumé/concept

Escalade sportive: réflexions médicales concernant cette nouvelle discipline olympique

Depuis que l'on sait que l'escalade sportive sera au programme des prochains jeux olympiques de 2020, des grimpeurs du monde entier sont impatients de voir leur sport reconnu sur la scène athlétique internationale. Cette décision historique montre l'immense intérêt et l'enthousiasme croissant pour cette discipline relativement nouvelle: l'escalade sportive..

Nous aimerions conseiller une approche prudente, étayée de bonnes informations afin d'établir ce sport dans le programme olympique. De nombreux articles ont déjà prouvé les effets bienfaiteurs et le faible risque d'accident de ce sport. Cependant, la formule des compétitions modernes et les méthodes d'entraînement chez les grimpeurs d'élite ont changé et nous remarquons un éventail plus large de lésions que par le passé.

Les nouvelles ascensions exigent l'usage des bras, des jambes, des mains et des pieds afin d'effectuer des mouvements bien plus intenses et complexes qu'auparavant et on remarque d'autres blessures comme par exemple des lésions du crochet du talon, des fractures de l'hamatum ou des œdèmes de la moëlle osseuse de la main, pour n'en citer que quelques-unes. Ces différentes formes de lésions nouvellement identifiées vont augmenter proportionnellement au nombre d'athlètes de haut niveau pratiquant ce sport. En plus, si les tendances actuelles continuent, l'âge moyen des grimpeurs d'élite participant à des compétitions internationales va baisser dans les années à venir. Cette baisse (attendue) de l'âge moyen des athlètes sera encore accélérée par l'introduction de l'escalade sportive en tant que discipline olympique. Nous observons dès maintenant des grimpeurs adolescents qui effectuent des ascensions qui battent le record du monde, que ce soit sur roche ou en compétition. Malheureusement, l'adolescence est une période très fragile pour ces jeunes athlètes et un entraînement trop intense peut avoir pour conséquence des lésions dues à ce sport.

La première compétition olympique d'escalade sportive sera constituée de trois sous-disciplines d'escalade. Jusqu'à présent, ces trois formes étaient du domaine de grimpeurs chevronnés, ces formes demandant les compétences requises tout à fait différentes les unes des autres. Reconditionner ces grimpeurs afin de les rendre compétitifs dans les trois disciplines constituera un véritable défi. On doit donc voir comment la fédération nationale d'escalade va modifier ses programmes de développement athlétique dans le monde afin d'avoir des médaillés d'or olympiques.

C'est pourquoi nous recommandons vivement:

- a) Pour les grimpeurs d'escalade sportive, un contrôle médical prudent, basé sur l'évidence, axé sur le sport.
- b) Une surveillance des installations et des conditions d'entraînement afin de garantir l'usage de prises d'escalade plus ergonomiques et conduisant à moins d'accidents; des routes bien pensées et réalisées et l'observation de facteurs d'âge dans le développement et la réalisation de nouveaux programmes d'entraînement. Alors nous serons sûrs que la nouvelle génération de grimpeurs d'élite (n'oublions pas non plus le facteur ludique) continuera à bien se développer dans un cadre sûr et effectif.

Mots-clés: Olympics, world cup, injury

Since the recent announcement that Sport Climbing was selected to be part of the next Summer Olympic Games in 2020, climbers around the world are eager to see their sport on the most world-renowned athletic stage. A few days ago, the *Tokyo 2020 Additional Event Program Panel* selected this very exciting and challenging sport, with its three sub-disciplines (*Lead Climbing, Speed Climbing* and *Bouldering*), to be part of the next Summer Olympics. This landmark decision reflects a huge worldwide interest and enthusiasm for the relatively young sport of climbing, which has exploded in popularity in recent years.

This is an exciting time for sport climbers, coaches and fans, however, we would like to recommend a cautious and informed approach to establishing this sport as part of the Olympic program, in order to prevent injuries known to be associated with training for and practice of sport climbing. Many publications have proven the health promoting effects and overall low injury hazard in sport climbing in the past (1-5), especially if performed indoors or in competition climbing. However, the modern competition format and training methods in elite climbers have changed, and we now see a wider spectrum of climbing related injuries than in the past (1,5,6). Fortunately, many of these injuries are preventable.

Two decades ago, sport climbing was performed mostly on vertical walls, whereas nowadays the climbs are more three-dimensional and often much steeper than vertical (6). Modern competition climbs require the use of arms, legs, hands and feet to perform far more strenuous and complex movements than before, leading to new forms of injuries like *heel-hook related injuries, hamate fractures* or *bone marrow edema of the hands, to name a few*. These newly identified injury patterns will become more prevalent with increasing numbers of high-level athletes in the sport (6,7).

Additionally, if current trends continue, the average age of elite climbers participating in international competition will continue to decrease over the next several years. This expected decrease in the average athletes' age, will likely be accelerated by the introduction of sport climbing into the Olympic program. Already, we are seeing world-record-breaking ascents being performed regularly by adolescent climbers, both on rock, and in competition. Unfortunately, adolescence is a highly vulnerable period for these young athletes, during which time high intensity training can result in sport-specific injuries like *epiphyseal fractures* of the fingers or *anorexia athletica* (8).

As already mentioned, the first Olympic climbing competition will be designed as a combination of the three climbing sub-disciplines: *Lead climbing, Speed Climbing* and *Bouldering*. Until now, these three forms of climbing were dominated by specialist climbers, as the different forms require totally different skill-sets. Retraining of the current specialist elite climbers to become competitive in all three disciplines of climbing will be a challenge. It remains to be seen how the

national climbing federations worldwide will modify their athlete development programs in order to produce potential Olympic gold medalists. It is also unclear how these changes will affect injury patterns observed in elite climbers in the future.

Moving forward, we therefore recommend:

- 1) More careful, evidence-based, sports-specific medical supervision of elite sport climbers.
- 2) Monitoring of training and competition facilities, to ensure the use of more ergonomic, less injury inducing climbing holds, careful route setting and consideration of age-specific factors in the development and implementation of new training programs.

In doing so, we can ensure that the new breed of elite (and recreational) climbers will continue to develop in a safe and effective sporting environment. With the world watching sport climbing at the Tokyo Olympics in 2020, it is even more important for medical professionals to help minimize its sport-specific injuries, so climbing can continue to be known as an exciting, accessible and health-promoting physical activity.

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