Patterns of knee injury among bouldering and rock-climbing athletes

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Video Abstract

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Abstract

Rock climbing is one of the fastest-growing sports on the planet. The upcoming 2020 Olympics in Japan will be the first to feature climbing as one of its prestigious events. While research has helped climbers learn how to avoid injuries to their upper body, surprisingly little is known about the effects of climbing on the lower body. Now, for the first time, researchers have discovered patterns of knee injury across both competitive and noncompetitive climbers. Their findings, published in the March issue of The American Journal of Sports Medicine, could offer athletes and healthcare providers useful tips on how to avoid or bounce back from injury. Over a period of 4 years, the authors of the study looked at 71 patients with 77 independent acute knee injuries due to climbing. Athletes were grouped by performance level, either competitive or noncompetitive, and injuries were classified by climbing type, due either to rope climbing or to bouldering, both indoor and outdoor. The team identified 4 distinctive maneuvers that led to knee injury: the high step, the drop knee, the heel hook, and in the case of bouldering, the fall. Overall, bouldering was linked to 69% of all injuries. The reason might be that while relatively short, bouldering routes normally involve hard moves, requiring strong body tension, difficult body positioning, and lots of strength. Among the leading types of injury were meniscal tears, sprains of the iliotibial band, and ACL injuries. These diagnoses could be traced back to the four climbing techniques identified by the authors. Medial meniscal tears were predominantly caused by the high-step, drop-knee, and heel-hook positions. Iliotibial band sprains were caused exclusively by the heel-hook position. And all ACL tears occurred due to uncontrolled falls. In terms of performance level, noncompetitive athletes had significantly more medical meniscal tears than competitive athletes and underwent more surgical procedures. While it’s unclear why, the authors note that the competitive group was significantly younger and carried less body weight. The teams findings can’t be generalized to all climbers. But they do point to ways of training safely. For athletes rehabbing an injury, rope climbing should be preferred to bouldering to avoid falls and direct impact on the knee. And all athletes, regardless of experience, might want to address muscle weaknesses not trained through climbing alone. More studies should help researchers weigh in further on the biomechanics of the knee during climbing. And with the sport only growing in popularity, understanding the science of climbing could be more important than ever.