Brokos – Protect Your ACL

Broko Snowboard Bindings allow continuous, subtle repositioning of your stance as you ride, allowing your feet to naturally assume the best angles for the particular fall line and conditions in which you find yourself. This takes pressure off knees and ankles; and reduces stress and fatigue on muscles. It also alleviates strain and awkward positioning in lift lines and on the lift.

Traditional bindings use your joints to absorb shocks and to move. Brokos transfer those forces to your muscles. Your muscles are designed to support these stresses. Your joints are not. Almost instantly upon switching to Brokos, you notice the relief on your ankles and knees. After a few days, you start to develop the muscle memory that takes over for the stresses your joints previously had to endure.

Some snowboarders (prior to trying Brokos) have expressed concern that they are more likely to experience an ACL tear with Brokos than with standard bindings. This is understandable at first glance – we've all had friends land wrong from a basketball or other jump, only to hear the scary "pop" of a torn ACL, but we demonstrate that such fears are misplaced. A common misconception is that the rider's feet move chaotically in an uncontrolled fashion. But this is no more of a concern on Brokos than when skiing, skateboarding, surfing or even walking. In fact, in any of the scenarios just listed, it is difficult to imagine performing these activities with feet locked into a particular stance.

An ACL tear commonly occurs when the upper and lower leg rotate in opposite directions (Fig 1), putting stress on the ACL. Other common injuries include sprained ankles and Lateral Process of the Talus (LPT) fractures.

Figure 1 – ACL Tear

The root cause of all these injuries is essentially the same, as seen in Figure 2. When landing from a jump, especially if the body is in rotation, say from a fast maneuver to fake a basketball opponent, the foot strikes the ground and is immediately stopped from further movement or rotation with the body due to the impact, illustrated by the red arrow next to the foot. This sudden stop causes rotation of the lower leg to accommodate the stopped foot, while the upper leg continues to rotate in the direction of the torso. If the unequal rotations continue, the result will be an ankle sprain, and ACL tear, or other lower-leg injury. High top shoes or boots help protect from ankle and LPT injuries.

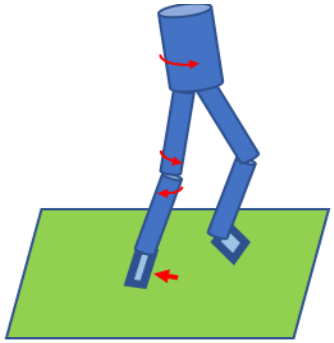

Figure 2 –Landing Stresses from a Jump

The main reason these injuries occur is that the feet and legs are not connected and can move in any direction, and there is nothing to keep one leg from stopping and flexing when the foot hits the ground. Skiers also experience this problem, since each ski moves independently, and the ski itself can generate a large torque on a leg by following the mountain or by getting suck in the snow.

Snowboarding is relatively immune from these types of injuries. The reason is that both feet are attached to one board, and the legs move together. With both legs moving together, any torque is distributed more evenly between both legs, and, unlike skiing or landing a basketball jump, there is little force causing one foot or leg to experience independent torque.

Even so, though rare, snowboarding is not without risk for ACL, LPT or ankle injuries. As an example, Figure 3 illustrates the stresses associated with landing on the toe-side and back edge of a board after a jump, say doing a 360.

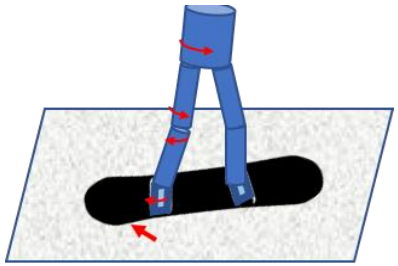

Figure 3 – Landing a Snowboard Jump

When the edge of the board hits, the torso continues to rotate, as does the upper leg. However, the impact causes the board rotation to stop, and the right foot, fixed rigid to the board, also stops. This creates a rotation of the lower leg opposite to that of the upper leg, and thus creates the possibility of an ACL tear. Approximately 17% of snowboarding injuries are ankle injuries, with half of those being LPT or other fractures. The mechanism of injury in "snowboarder's fracture" is generally due to dorsiflexion of the ankle with inversion of the hind foot. This action occurs during a landing from an aerial maneuver or jump, especially when the landing is over rotated, as in Fig. 3.

In looking at Figure 3, it is clear that the only stress on the rider's foot is due to the foot being locked rigidly to the board. There is no additional torque or force compelling the lower leg to turn counter to the upper leg and torso.

When a Broko Rotational Binding is placed between the rider's boot binding and the board, the effect of the torque due to the landing is reduced, as illustrated in Figure 4. The predominant force on the lower leg is the torque from the upper leg and torso.

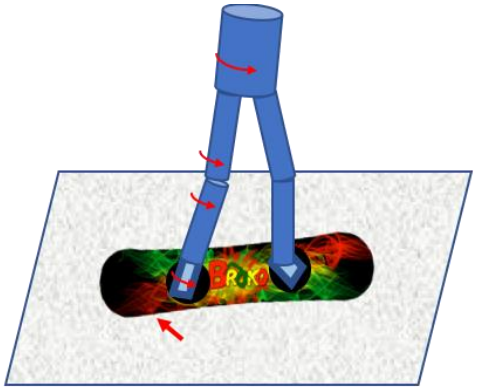

Figure 4 – Stress Reduction with Broko Bindings

Since the foot is free to rotate on the board, the leg naturally rotates in the same direction as the upper leg, and the ability of the foot to rotate accommodates this. These motions are subtle; but occur at two points. First, while in the air, the foot naturally positions itself in the most beneficial position for landing (within the constraints of a snowboard in general, of course), just as you do when jumping from a wall or when running and jumping. Second, if required upon impact, the foot further rotates to absorb the impact and minimize stress on the knee and ankle.