

#### Patient

- Youth Female Athlete
- Soccer Player
- ACL reconstruction
- Patellar Tendon Graph
- 5 Months post surgery
- Having problems with beginning field activities

#### Evaluation

- Isokinetic
  - Slow Speed - 10% deficit
  - High Speed - 17% deficit
- Force 2.0 –
  - Force - **58% deficit**
  - Power - **62% deficit**
  - Contact Time - **39% deficit**

#### Training Plan

- Ground based training
- Basic Strength and power Training
- Speed and metabolic training on Force 2.0

#### Force 2.0 Features Used

- Functional Assessment
  - Identify differences not observed through isokinetics
  - Feedback to healthcare team
- Training
  - Build-Ups
  - Resisted & Release Starts
  - Resisted Sprints
  - In-Outs
  - Metabolic Intervals
  - Metabolic Game Demand Simulation

#### Training Results

- Return to play
- Improved Speed (0.4 sec 40)
- Return to play eval
  - Force - **10.5% deficit**
  - Power - **12.9% deficit**
  - Contact Time - **14% deficit**

#### Patient History

Tasha is a high school soccer player who suffered an Anterior Cruciate Ligament (ACL) tear in her right knee during her high school season. Her ACL was replaced surgically with a Patellar Tendon Graph. Her initial goal was to return to play between 6 and 9 months. She had been cleared to begin “light running and simple skill practicing” by her physician. When she began trying easy running and agility drills on the field, she felt weak and unsure.

#### Evaluation

At the time of her evaluation on the Force 2.0, she was 5 months post surgery. A battery of tests was performed to evaluate strength, ROM, power, and agility. A recent isokinetic test indicated a force production deficit of 10% at slow speed and 17% deficit at high speeds. With that in mind and her progress in the physical therapy protocol she was cleared to begin on field training with restrictions.

She was evaluated while running on the Force 2.0 to assess differences in force, power, and contact time between the involved and uninvolved extremities. Tasha displayed significantly greater deficits when assessed functionally on the Force 2.0. This correlated with the feelings she had been having as she had attempted some on field running and drills.

While the isokinetic test did evaluate different parameters at 2 speeds, it was performed in an isolated knee extension and flexion. Many practitioners have advocated more functional testing with multi joint involvement in a ground-based stance. Her test results (see sidebar) indicated there was a very real difference between these testing methods.

#### Training Program

Tasha subsequently began a series of progressions in dynamic movements to build stability, proprioception, rate of force development, and power. Coordinating with physical therapist, a protocol was used to take advantage of the treadmill’s special loading capabilities to develop functional strength and power. Ground based movements were used to regain agility and develop proper movement patterns for stopping and cutting.

This training included running on the Force 2.0 initially with no load and progressing up to 10% of bodyweight. She trained 3 times a week and the drills included build-up sprints, resisted sprints, In-Outs, resisted starts, release starts, and metabolic interval training. A series of game simulation protocols were developed on the computer and used in her metabolic training. These featured dynamically changing speed and load requirements controlled by the computer.

#### Client Success

After 4 weeks of training she was reevaluated. The deficit between the left and right extremities had been reduced significantly. She reported more confidence to begin on field drills. She continued to train 2 times a week as she progressively increased her training on the field.

At 9 months post-op she returned to full play. She displayed almost no differences during high or low speed isokinetic testing (5% and 2%) and acceptable differences on the Force 2.0. The following week, in a team testing session, she ran a 6.2 40 yd dash. Her previous best 6.6 seconds.

## Initial Assessment



## Post Training Assessment

