# Getting Back in the Game

Since he was seven, Duncan Elias has had but one dream: to be a professional footballer.

Countless times, he envisioned himself scoring spectacular goals in front of adoring fans. Over and over, he has imagined himself clutching a trophy and riding high on the shoulders of his cheering teammates.

Not once, however, did he picture himself carried off the field in pain, his dream shattered by a torn ligament.

In May 2005, while playing a football match as a member of the armed forces team, Duncan was injured. The 20-year-old had just executed a kick in midair in the National Football League match when he was tackled and fell awkwardly.

That moment, his world crashed. Recalled Duncan, "As soon as I fell, I heard a pop like the sound you hear when you open a champagne bottle. I screamed in pain. I didn't know what was happening."

Carried off the field with a swollen knee, Duncan was told to go home and ice his knee. He didn't think much of the incident. "After the game, I even went out with my friends for dinner, though I was walking with a limp." But later, he woke up at two in the morning to find he could not lift his left leg. Using his mobile phone, Duncan called his father and said, "I think we better go to the hospital."

Duncan was referred to Dr Chang Haw Chong, a consultant orthopaedic surgeon at Changi Sports Medicine Centre, a unit within Changi General Hospital dedicated to treating sports injury. Here, a Magnetic Resonance Imaging (MRI) scan was done.

*Dr Chang Haw Chong, a Consultant Orthopaedic Surgeon at Changi Sports Medicine Centre*

The diagnosis: Duncan had torn his anterior cruciate ligament as well as his medial collateral ligament.

"I have seen football injuries on the games on TV and in real life, but I never imagined it could happen to me," confessed Duncan.

The tearing of the anterior cruciate ligament is one of the most common sports injuries. Young people aged 15 to 25 who play basketball, soccer and other sports that require pivoting are especially vulnerable to this injury.

Ligaments are tough, non-stretchable fibres that hold bones together. The anterior cruciate ligament is a stabilising ligament located in the centre of the knee joint and connects the thighbone to the shinbone. It limits the side-to-side rotation of the lower leg and prevents the lower leg from moving too far forward in relation to the knee. It also keeps the knee stable.

Once torn, the anterior cruciate ligament unravels like a braid rope and does not heal on its own. Typically, the anterior cruciate ligament can be stretched beyond its limit and torn when one slows down suddenly or pivots with the foot firmly planted, and by twisting or overextending the knee.

*Duncan getting the all clear from Dr Chang*

"I have seen football injuries on the games on TV and in real life, but I never imagined it could happen to me."

Landing awkwardly from a jump is also a common cause of this injury. If the anterior cruciate ligament is partially torn, the injury can be rehabilitated. This was not the case for Duncan.

The medial collateral ligament is another ligament that sportsmen frequently rip (medial means on the side closer to the midline of the body). It connects the medial side of the thighbone to the medial side of the shinbone. Most medial collateral ligament tears have the potential to heal.

Unfortunately for Duncan, his medial collateral ligament injury was severe and did not heal well despite knee bracing. Instead, he was given two grim choices: give up football or have both his ligaments reconstructed.

Successful anterior cruciate ligament reconstruction surgery tightens the knee and restores its stability. It prevents further injury and allows the patient to get back to playing sports.

After the surgery, however, the patient needs physiotherapy to strengthen his thigh and calf muscles in order to support the reconstructed knee as well as to gradually return his knee to full flexibility and stability. This means a spell of six to nine months' absence from sports.

"When I heard that I would not be able to play sports for six to nine months, I got light-headed," recalled Duncan.

"I was at a crucial stage in the development of my career. I have been playing in a team since I was seven and I have been turning out for Tampines Rovers (a local league team) since I was 12. This is what I've always wanted to do. I was worried whether I would be able to carry on with football if I were away from the game for so long. But my mom talked to me and said I had to go for the surgery since football is something I want to do my entire life."

Once he had decided on the surgery, Duncan had one more decision to make: to have the ligament reconstructed using his own tissue (called an autograft), or using tissue taken from a cadaver (called an allograft).

While there is no difference between the performance of an allograft and autograft in the knee over time, each has its pros and cons.

In the end, Duncan decided to opt for allograft. "Both my mom and I were against an autograft because we didn't want to touch a perfectly good leg," explained Duncan.

Post-surgery, Duncan was on crutches for three weeks and had a brace covering his entire leg for a month and a half. But he put his heart into rehabilitation, undergoing three rehabilitation sessions a week in order to get back into the game.

Duncan's rehabilitation was guided by a team comprising a sports orthopaedic surgeon, a sports physiotherapist and a sports trainer who remained with him throughout the entire rehabilitation period.

*Duncan in a rehabilitation session*

Two months after the surgery, he was able to play basketball. Seven months later, he was completely pain-free.

Commented Dr Chang, "Duncan's results were very good. He now has a stable knee. Measured with a knee arthrometer, his left knee is now as tight (or strong) as his uninjured right knee. He was walking with crutches within the first month after the surgery. At the four-month mark, his knee was functioning as normal."

Said Duncan, "I am satisfied with the result; the knee is definitely stable. When I start playing football again, I believe my performance will be as good as before.

In fact, Dr Chang said the next time I get a knee injury, it would be my right knee rather than my left because my left is now quite strong."

He has since recommended the surgery to another friend who suffered the same injury.

"I told him that this is the best place to be treated because the doctors and the nurses are very good and the facilities here are top-notch."

Duncan added, "On hindsight, the operation was the only option for me."

## Autograft Versus Allograft

In an autograft, the damaged anterior cruciate ligament is replaced with strong, healthy tissue taken from another area near the patient's knee. After harvesting the graft, the surgeon threads the graft through the inside of the knee joint and secures the ends to the thighbone and shinbone.

Autograft offers a good track record of success of 92 percent worldwide and costs less than allograft because the graft comes from the patient's own body. However, there are some drawbacks.

Autograft requires a bigger incision, so as to harvest the graft from the patient's own body — usually a strip of tendon either from under the kneecap (patellar tendon) or the hamstring. This entails more pain as well as a slower recovery. There is also a risk of impairment to the part from which the graft was borrowed.

An allograft is a graft taken from another human being, in this case, a cadaver. The advantages of using allograft tissue include less pain — because the graft is not taken from the patient — and quicker surgery time. Incisions are also smaller — about two times smaller than that for autograft. Another plus is that the graft can be made to measure, to match the size of the patient's ligament.

Recovery from surgery is also usually easier, faster and less painful because the patient doesn't have to recover from the removal of his tendon for the graft.

There are, however, some downsides to using allograft. Not only is allograft more expensive, there can be a risk of viral transmission, including HIV and Hepatitis C. There have also been several reported deaths linked to bacterial infection from allograft tissue, due to improper procurement and sterilisation techniques.

However, Dr Chang pointed out that the risk of contracting HIV through an allograft is 1 in 1.67 million. Nevertheless, he added that orthopaedic surgeons who intend to use allografts on their patients must know the ins and outs of the tissue bank from which they obtain their allograft. "The surgeon's knowledge of the tissue bank's practices in donor gifting and screening, serology testing and processing is important when making the decision to use these allograft tissues."