Keeping up with the active amputee

John McFall

John McFall became an amputee following a motorcycle accident in 2000 and following that obtained a BSc and MSc in Sports and Exercise Science in South Wales, with a particular interest in biomechanics and gait analysis. John competed at the Paralympic Games in Beijing 2008 and then studied medicine, graduating from Cardiff University in 2014. He is currently a Trauma and Orthopaedic ST6 in the Wessex Deanery and lives with his wife and three children in the north east of Hampshire.

I'm woken by the warmth of the infusion of contrast into my femoral vessels. Immediately I have flash backs to the accident. To the dust. The blood. The pain. To my helplessness. My elbow bloody hurts. I lift my head to see a spanning ex-fix on my right leg. The angiogram confirms an avascular limb, and the consequences of tissue ischaemia were starting to affect my physiology. I have an emotional conversation with my father who has flown urgently from the UK to meet me.

In August 2000 at the age of 19, I crashed a motorcycle on Koh Samui, Thailand. I probably suffered an open knee dislocation or open tibial plateau fracture with vascular injury – but in truth, I can't be sure. What was certain was that I returned to the UK with five fewer toes than I'd left with, and a piece of my right tibia and fibula in a jar of formalin. Quite the souvenir!

In the months following my injury, I wrestled with coming to terms with my new identity. I shared more than one cathartic moment with my incredibly supportive family and close friends. I cursed and I cried. I recall lying in my hospital bed as an inpatient in Roehampton, back when the Douglas Bader ward still existed. It was about one o'clock in the morning and I couldn't sleep for rumination. I found myself sobbing. Absolutely uncontrollably. I reached for a heavy book on my bedside table. It was a photo album that I had been filling with memories of my travels. I turned to the inside of the back cover and began scribbling some words. The gist of my ramblings brought into sharp focus the fact that I was alive and loved; and that behind the doors for which I was now reaching lay only opportunity.

In 2001 I started a degree in Sports and Exercise Science at Swansea University. It was there that I taught myself to run again. It wasn't pretty. Running on a prosthetic knee and foot designed primarily for walking requires you to go all in – you've really got to commit and put a lot of effort in to do anything that

resembles sprinting. That also means when it goes wrong it can be quite spectacular! By far the most catastrophic was when the hydraulic cylinder would explode mid-sprint, spraying oil all over me and the track. I developed a very understanding relationship with Tom Wickerson, my Prosthetist at Roehampton. After the eighth or ninth hydraulic catastrophe, I contacted Tom to request a replacement cylinder. He, instead, suggested building a leg specifically for running as the amount of hardware being returned under warranty was starting to draw attention! In the spring of 2003 I took receipt of my first running leg. It comprised a small four bar link swing-phase only knee and the iconic carbon fibre blade. To our knowledge, at that time it was the first of its kind to be built on the NHS.

I remember, so vividly, the first time I used my running leg. It was at the National Indoor Athletics Centre, Cardiff. I cried because this is what I remember what running felt like. I had underestimated how much impact physical activity, and the importance of having the right equipment, could have on my rehabilitation.

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The Ninth International Games in Stoke Mandeville in 1960 is considered the first Paralympic Games. Publicity surrounding Paralympic sport was sparse. The tremendous media coverage by the Australians of the Paralympic Games in Sydney in 2000 was a huge step forward in terms of launching disabled sport onto the world stage. In 2005, it was announced that London was to host the Summer Olympic and Paralympic Games in 2012. In preparation, there was a huge amount of interest around disabled sport and national success at the 2008 Paralympic Games in Beijing boosted enthusiasm.

When I competed in Beijing, I was humbled by the passion and admiration the Chinese people showed for the Paralympic movement. The 90,000 seater stadium was almost full during my 100m sprint final. Following my race, I could barely walk five yards from the stadium to the GB Team Headquarters without getting stopped by complete strangers wanting their photograph taken with me! It was in such stark contrast to the empty grandstands of Athens four years earlier. The Chinese really had embraced Paralympic sport and, most importantly, the world had noticed.

Back at home, as a result of the war in Afghanistan there were increasing numbers of young, fit British soldiers feeding into the ever improving national Paralympic sporting infrastructure. In anticipation of a home Olympiad the Paralympic movement gained traction. The London 2012 Paralympic Games was an absolute triumph. It quenched the hearts and minds of a nation ready to see ability in disability. It was an event that moved us forward as a nation.

I didn't compete at the London 2012 Paralympic Games, choosing instead to go to medical school and get a proper job! I was, however, privileged enough to work there for several different organisations. In the lead up to London 2012 I was approached by a global healthcare company to give them some feedback on a running prosthesis they were planning on launching at The Games. One thing led to another and I ended up becoming the face of their global marketing campaigns for several prosthetic products. I've been using these world leading high end prosthetics for nearly 10 years, but as my contract with this company draws to close I worry that, as a civilian, I will no longer have access to these same components on the NHS.

There has been significant progress in the provision of advanced prosthetics on the NHS in recent years, and, in 2016, the NHS clinical commissioning policy for microprocessor knees (MPKs) was published. >>

However, there is still a marked discrepancy in prosthetic provision for the very active civilian compared to military personnel, with a K4 activity level (the highest) being a contra-indication for a microprocessor knee in the NHS patient.

For the patient this leaves only an application to a specialist commissioning group where their individual case can be considered. It concerns me greatly to think that my future prosthetic provision could be determined by a body who may not appreciate my aspirations and ambitions, and whose judgement is likely to be constrained by the economics of a struggling public healthcare system. The functionality of an advanced waterproof microprocessor knee has allowed me to live a 'normal' life. I can run for a Frisbee, go rock-pooling with my children, and help them learn to swim in the sea. I can walk up and down stairs foot over foot, and go about being a surgical trainee without people ever knowing I'm a through knee amputee.

My own story is not important, because behind every person who has suffered life changing injuries is a story like mine. A story of loss, grief and metamorphosis. However, I believe the Paralympic movement has brought these individuals hope. The Paralympic movement is not about elite sport. It is about challenging the perceived norms of physical disability, recognising the desires of individuals to push beyond the boundaries expected by the NHS clinical rehab office and, in my case, creating the conditions to meet the expectations of the highly active civilian amputee population. For hope to turn into reality it is imperative we provide a level of rehabilitation services that reflects our endorsement of the Paralympic movement. For the very active individual with an acquired amputation, we should never underestimate the role technology plays in the return journey to personal identity and sense of self. ■

Q&A WITH JOHN MCFALL

As orthopaedic surgeons, what can we do to support our patients going through the trauma of amputations?

Having a relationship with your local limb loss rehabilitation services and seeing what happens to these patients would help with future early signposting and management of patients' expectations.

What are the aspects of rehabilitation that are most important in maximising psychological and physical function?

For me, physical activity was hugely important for my emotional recovery and I believe the two go hand in hand. For a prosthesis wearer having a good, healthy stump and being comfortable in a socket are fundamental to maximising physical function. It doesn't matter what fancy componentry you put underneath a socket, if it's uncomfortable the patient won't wear it. Tell patients to fight for this.

Not all amputees will end up using prostheses (usually complex high level amputations), but patients don't have to wear a prosthesis to be active. Hand bikes and wheelchair sports are hugely popular and accessible.

How can suitable and interested patients get involved in disability sport?

Nowadays the vast majority of mainstream sports clubs welcome, and have provision for, people with disabilities. The website **www.parasport.org.uk** is supported by Paralympics GB and is probably the best place to start for grass roots opportunities in disability sport.

What resources are available for patients and surgeons to help maximise quality of life, sports and recreation following traumatic amputation?

There is a plethora of active amputee groups and forums that can be found online. For patients that have the means, there are a number of private prosthetic service providers, such as Dorset Orthopaedic, who have extensive experience making prosthetics from life like silicon finished arms to Paralympic running blades and cycling legs.

For surgeons, NHS England and other Home Nations have published commissioning guidance for prosthetics. Patients are entitled to an 'every day' limb (which may include a MPK) and a recreational limb to meet their clinical needs and rehabilitation goals. Having an awareness of this will help manage patient expectation.

What do patients need to be careful of when engaging with sports?

The main thing to be aware of is meticulous stump care when doing sport using a prosthesis. Increased sweat, shear forces and fluctuations in stump volume can cause stump damage. Amputees should gradually increase activity levels and check their stump for damage regularly, especially denervated areas.

Anecdotally, because a below knee prosthesis is patella tendon weight bearing like a Sarmiento cast, I have seen several tibial plateau fractures in trans-tibial amputees (middle aged) secondary to disuse osteopenia. Insufficiency and fragility neck of femur fractures are also possible in trans-femoral amputees for the same reason. ■