RECENT ADVANCES IN SPORTS INJURY SURGERY

Lennard Funk, Sanjiv Jari, Henry Maxwell & Christopher Brookes
Manchester Sports Medicine Clinic

INTRODUCTION

Over the past decade we have seen huge advancements in sports performances. Athletes are stronger, faster and bigger than ever. This has been due to an improved understanding of sports performance, application of scientific research, technical improvements of equipment, training and more specialised, skilful and dedicated athletes.

Alongside these advances, similar developments have been occurring in the field of Orthopaedics and Sports Surgery. Technical developments and our understanding of sports-related injuries has advanced in the past decade more than any other time in history. Surgeons have developed skills in minimally invasive and arthroscopic surgery to the level where it has become the accepted standard. Our better understanding and application has led to faster rehabilitation periods and return to sports.

Utilise the specialist surgical expertise and advice that is easily available

These surgical developments are new and not well known by traditional Orthopaedic surgeons. Therefore, teams and athletes in the United Kingdom have often sought treatment abroad. However, this is not necessary, with the development of US style Sports Surgery groups, like the Manchester Sports Medicine Clinic (MSMC). Our surgeons have trained with leading international specialists and are pioneering techniques for improving the treatment and return to sports for athletes. We recognise that one cannot be an expert on every part of the body. Forming a group offering subspecialist surgical expertise to amateur and professional athletes has ensured each athlete is seen by an expert for their particular injury. This article covers the advances in knee and shoulder surgery - the most commonly injured joints in sports.

KNEE INJURIES

Advances in knee surgery and sports medicine occur hand in hand with advances in technology development. Here we cite only two of the many advances in sports knee surgery.

CARTILAGE INJURIES

One of the ideal examples of developments of new technologies is in the investigation and treatment of articular cartilage (chondral) injuries of the knee. This is a very common condition and chondral injuries of the knee have been described in up to 64% of knee arthroscopies. These are commonly associated with anterior cruciate ligament tears, patello-femoral dislocations and idiopathic conditions such as osteochondritis dissecans.

With the development of magnetic resonance imaging technology and the production of high resolution scanners using 3 Tesla magnets, the non-invasive investigation of joint and articular pathology has come to the forefront. At the Manchester Sports Medicine Clinic we are fortunate to have direct access to a 3 Tesla high resolution scanner, which is ideal for imaging articular cartilage and will allow the determination of the site, size and depth of chondral lesions. With this information appropriate treatments can be planned.

The traditional treatments of chondral injuries include techniques such as subchondral drilling, microfracture and abrasion chondroplasty, all of which result in breaching of the subchondral plate to allow bleeding into the defect which will then form a scar tissue. The scar tissue histology however is that of fibrocartilage which does not have the same properties as normal joint hyaline cartilage. Up until recently there were no reproducible techniques that would allow the regeneration of hyaline cartilage, as human chondrocyte, once damaged, does not have any intrinsic potential to produce hyaline cartilage. A technique that we now use is Autologous Chondrocyte Implantation (ACI), whereby articular cartilage is biopsied at an arthroscopy as a first stage. The cells are then sent to a laboratory where the chondrocytes are isolated and then grown. The cells are then sent back in either a liquid form or on a membrane and as a second stage procedure the chondral defect is treatment by debridement and laying in the new chondral grown cells. This second stage is also usually done using minimally invasive technique.

The results look promising with an up to 80 to 90% resolution of the patient's symptoms depending on the defect. Retrieval biopsy studies also show a high proportion of hyaline cartilage

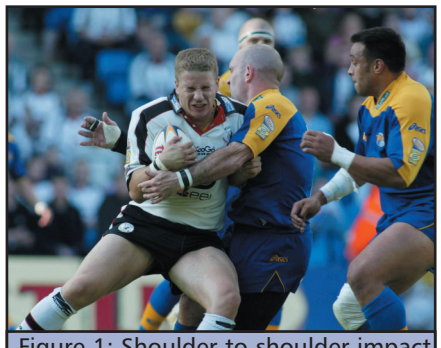

Figure 1: Shoulder to shoulder impact in rugby

development. This suggests that the chondral cells which are being transplanted are indeed doing what they are supposed to and are regenerating new normal hyaline like cartilage.

ANTERIOR CRUCIATE LIGAMENT INJURIES

Anterior Cruciate Ligament (ACL) injuries are an ever increasing injury amongst an active population. There are ongoing debates in the orthopaedic and sports medicine community about the best graft type, the best method of fixation, the approach which should be used for the procedure and so forth. However, of prime importance is the patient's outcome. We perform a significant number of ACL reconstructions during a year and recognise that patients are not concerned about which graft, technique or approach is used. All they are concerned about is how quickly they can return to sport. We have instituted accelerated rehabilitation protocols, instituted from the moment the patient wakes up from surgery, concentrating on swelling control, achievement of full motion as soon as possible as well as an aggressive strengthening programme.

The national average of return to sports after an ACL tear in the UK is about 12 months. However, most of our patients are able to return to full competitive sports within 5 to 6 months of their surgery, depending on how their rehabilitation is progressing. The assessment of the rehabilitation is also scientifically assessed using a KT1000 (an instrumented measure of ligament laxity) as well as isokinetic strength testing.

SHOULDER INJURIES

The shoulder is the second most commonly injured joint in sports, after the knee. Up until recently it was known as the 'Unknown joint'. Most shoulder injuries are of a "soft tissue" nature and not visualised on x-rays. Standard treatment has consisted of repeated blind corticosteroid injections, without a definitive diagnosis. Over the past decade, our understanding of the complex mechanics and injuries of the shoulder, along with advances in arthroscopic surgery and imaging, has increased substantially. We now recognise and treat previously unknown injuries, such as SLAP tears, and are able to treat rotator cuff tears and instability as day-case procedures with minimal morbidity using arthroscopic techniques.

Figure 2: Arthroscopic shoulder surgery has become routine for almost all shoulder procedures`

SPORTS INJURIES

The injuries sustained by contact and impact athletes, such as rugby players, leads to specific injury patterns completely different to overhead throwing athletes. MSMC has considerable experience in treating overhead and impact athletes with shoulder pain. This has led us to describe and recognise, previously undescribed, specific injury patterns in contact athletes. Rotator cuff tears are less common than previously thought, but labral injuries are very common, and easily reparable arthroscopically. We have also found a higher incidence of superior and posterior labral injuries in rugby players than other sports and developed specific rehabilitation programmes for the specific patterns. The time taken to return to sports has been reduced substantially, working in conjunction with the team therapists and conditioning coaches.

DIAGNOSIS

Office ultrasound scanning has been a revolutionary tool for the quick diagnosis of rotator cuff tears and acromioclavicular joint injuries, leading to early repair and better outcomes. With portable machines and expertise we are able to offer instant diagnosis and prognosis to athletes. We also perform all shoulder and elbow injections under ultrasound guidance for improved accuracy.

INJECTIONS

There is mounting evidence of the detrimental effects of steroids on the rotator cuff and other tendons. Their benefit is only short-term and it is restricted under the World Anti-doping Agency (WADA) regulations. At MSMC we have pioneered & published on the use of hyaluronan injections in the shoulder. This has been shown to have equivalent pain relief as steroids, without the detrimental effects and post-injection pain. There are also no restrictions on the use of hyaluronan injections by WADA, unlike steroids.

SHOULDER SURGERY

The shoulder is a deep joint, hidden under many large muscles. Open surgery is painful and prone to complications of the joint access.

Open shoulder surgery has traditionally been the gold standard, but that no longer applies. The redislocation rates for arthroscopic shoulder stabilisation (Bankart repair) is now lower than open procedures, with less post-operative stiffness. This is essential for throwing and overhead athletes. The success rate of arthroscopic rotator cuff repairs is equivalent to open surgery, without the extended period of immobilisation and morbidity. On reviewing our outcome data at MSMC, our athletes are returning to contact sports 4 weeks after subacromial decompression and acromioclavicular joint surgery and 3 months after arthroscopic stabilisations and rotator cuff repairs.

These outcomes are also due to the rehabilitation - both pre- and post-operative. The surgeon must play an active role in this process. We have managed to return athletes to their sport sooner by working closely with the therapists and conditioning coaches.

Arthroscopic shoulder surgery is very different to open surgery and the skills required are completely different. It is essential that a surgeon be specifically trained in arthroscopic shoulder surgery, as our surgeons at MSMC are. When referring your patients it is worthwhile knowing the experience, training and outcomes of your chosen surgeon.

CONCLUSION

This is just a short summary of some of the advances and technologies that are being used in sports medicine surgery. The same principles are applied to the treatment of degenerative joint disease and other aspects of modern Orthopaedic care. It is difficult for the general practitioner and team clinician to keep up with all the advances in each area. Therefore, you should utilise this specialist expertise and advice that is easily available to return your athletes to optimum fitness as soon as possible. ■