

Increased morbidity and mortality for patients with insulin dependence undergoing shoulder arthroscopy X-ref

■ Arthroscopy is considered to be 'low-risk' in terms of surgical procedures, having generally very low morbidity and mortality. However, despite general perceptions, there are few research publications that confirm this assumption. Investigators in **Charleston, South Carolina (USA)** used the American College of Surgeons National Surgical Quality Improvement Program database to investigate the outcomes of diabetic patients undergoing shoulder arthroscopy.¹ The study was set up to establish if patients who are insulin-dependent are at increased risk of complications and death following arthroscopic shoulder surgery. In what is, of course, a large retrospective study, the investigators compared patient outcomes after undergoing shoulder arthroscopy in those who were non-diabetic ($n = 50626$), insulin-dependent diabetic (IDDM, $n = 2484$), and noninsulin-dependent diabetic (NIDDM, $n = 5332$). Analysis was undertaken, which was adjusted for age, sex, body mass index, hypertension, congestive heart failure, chronic obstructive pulmonary disease, smoking, American Society of Anesthesiologists classification, and functional status. Overall, the results demonstrated that IDDM patients were at increased risk of complications, with an adjusted odds ratio of 1.524, including pulmonary complications and urinary tract infections. The research team also identified a higher risk of 30-day readmission and 30-day mortality in the IDDM group, with adjusted odds ratios of 1.581 and 3.821, respectively. NIDDM patients had results similar to the nondiabetic controls. While this investigation is limited by the nature of the database and retrospective format, it highlights the increased perioperative risks for patients with diabetes, even in surgical procedures believed to be relatively 'low-risk'. This investigation highlights the importance of arthroscopic patient selection when considering comorbid conditions like diabetes.

The influence of artificial turf versus natural grass on knee injuries in American football X-ref

■ The increasing use of artificial turf for American football in the National College Athletic Association (NCAA) remains an area of controversy. Furthermore, the effects on rate and types of injury

suffered by the athletes are currently unknown. Of particular concern is knee injuries, which are already known to have a high incidence in American football. Colleagues from **Washington (USA)** sought to investigate the impact of the provision of artificial turf on the occurrence of knee injuries over the course of ten years.² During this time period, the authors were able to analyze 3 009 205 athlete exposures using the NCAA Injury Surveillance System. Injuries to the anterior cruciate ligament (ACL), posterior cruciate ligament (PCL), medial collateral ligament (MCL), medial and lateral menisci were recorded as 'events' for the purposes of this investigation. They were then further analyzed based on occurrence on natural grass or artificial turf, and level of competition (Division I, II, or III). Knee injuries were seen to occur more in competition compared to practice, and of the 2460 injuries identified, there were 1389 MCL injuries, 522 ACL injuries, 269 lateral meniscal tears, 164 medial meniscal tears, and 116 PCL injuries. The occurrence of meniscal tears and MCL injuries was not significantly different between natural grass and artificial turf; however, the rate of PCL injuries was 2.94 times greater in athletes competing on artificial turf. The rate of PCL injuries in Division I players competing on artificial turf was 2.99 times that of those competing on natural grass. In Division II and III players, both PCL (3.13 times) and ACL (1.63 times) injuries were increased on artificial turf compared with on grass. This investigation is limited by its retrospective nature, and the authors were unable to identify any mechanistic differences in injuries between playing surfaces, although it would seem probable that the increased traction afforded by artificial turf may play a role. This research highlights the importance of further investigation and player safety as the popularity of artificial turf for athletic competition increases in the United States.

Meniscal repair in patients over 40 years of age X-ref

■ The importance of meniscal preservation is well established, promoting increased efforts for meniscal repair when possible. With increasing age, the meniscus exhibits both decreased vascularity and healing potential. Considerable controversy exists as to at what age a meniscal tear becomes 'irreparable'; however, there is a general move in the surgical population towards extending the indications

for repair. Surgeons in **Columbus, Ohio (USA)** retrospectively analyzed 221 patients who underwent meniscal repair, with 56 being older than 40 years and 165 being younger. All surgeries were performed by a single fellowship-trained surgeon, and logistic regression was used to determine risk of failure with control for body mass index, sex, anterior cruciate ligament status, time from injury to surgery, number of implants used, tear pattern, and chondral status. For this study, follow-up averaged five years and the overall failure rate of meniscal repair was 20%, which is comparable to that reported elsewhere in the literature. The failure rates in patients older and younger than 40 years of age were 18% and 21%, respectively, suggesting no real terms difference in failure rates. Age over 40 years was not found to be an increased risk factor for failure of meniscal repair. However, in those whose repairs did fail, the mean time to failure was shorter at 16.9 months compared with 28.5 months in the younger group. The significance of this finding is not clear, but results suggest that (when otherwise appropriate) meniscal repair in patients over the age of 40 years has considerable success. It is also possible that, since 'asymptomatic' patients did not undergo further investigation, some patients aged over 40 years may have actually return their meniscal repair without significant functional consequence. Other than the smaller increased operative time and the costs of the suture repair system, we can see no disadvantages in undertaking meniscal repair in patients aged over 40 years and this very helpful paper demonstrates similar success rates to the younger groups.

Outcomes of shoulder stabilization in overhead athletes X-ref

■ Anterior shoulder instability is common in athletes, and the treatment of athletes whose sports require overhead activity remains particularly challenging. The outcomes of conservative management of instability are poor in the young. This is compounded in the athletic population, who tend to be younger but are also known to have increased recurrence of instability and less success returning to their previous activity level. The Multicenter Orthopedic Outcomes Network (MOON) shoulder instability consortium sought to identify prognostic factors associated with a successful return to sport at two years postoperatively in a research study based in **Ann Arbor, Michigan**

(USA).⁴ The authors report the clinical outcomes of overhead athletes undergoing primary arthroscopic anterior shoulder stabilization, including recurrent instability or reoperation, and return to sport. Of note, some athletes in the cohort participated in multiple overhead sports preoperatively. The study collected recorded medical notes as well as recording subjective outcome scores. Analysis was undertaken including regression to determine factors predictive of return to sports participation. Of the 49 overhead athletes included in the trial, only 31 (63%) reported return to at least one overhead sport at two years, and only 22 (45%) returned to the same level of participation. Two patients (4.1%) underwent revision surgery, and 14

(28.6%) reported subjective apprehension or instability from a clinical perspective at final follow-up. In terms of risk factors, the authors identified that patient age, sex, baseline competition level, range of movement, and subjective outcomes scores showed no significant differences in those who did and did not return to sport. Although addressing anterior instability in the overhead athlete remains particularly challenging, it would seem that less than half of these overhead athletes are returning to overhead sport following surgical treatment. Long term follow-up may provide additional guidance, but, based on these outcomes, the goal of return to sport may not be realistic for the majority of patients.

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Foot & Ankle

X-ref For other Roundups in this issue that cross-reference with Foot & Ankle see: *Research Roundup 5*.

Total talus for a total ankle arthroplasty?

■ Total ankle arthroplasty (TAA) is increasingly being used for treatment of end-stage arthritis of the ankle. However, there have been valid concerns regarding the success of the procedure in patients with inadequate bone stock of the talus, as talar loosening remains a common mode of failure of TAA, along with a range of other talar complications, such as subsidence avascular necrosis and fracture. In this paper, researchers from **Nara (Japan)** present their midterm report of TAA using a total talar implant (combined TAA).¹ The TAA prosthesis used was TNK ankle (Kyocera, Japan). The TNK ankle is a third-generation, two-component alumina ceramic prosthesis, in which the polyethylene insert is fixed to the tibial component. The talar component was custom-made. In the standard TAA group, the talar component was cemented but the tibial component was cementless, although the authors used “beads of cement”, bone marrow, and calcium phosphate paste to induce osseointegration. The postoperative regime was similar in both groups. None of the patients required ligament reconstruction in the combined TAA group, as the ankle was deemed stable following talar implant insertion. The authors presented the functional and clinical outcomes of ten patients who underwent combined TAA between 2009 and 2013. Outcome was compared with 12 patients matched by age, sex, and follow-up who

underwent standard TAA. Mean follow-up was just short of five years for the combined TAA group. Both groups reported significant improvement in pain and function. The two groups did not differ in pain relief or functional improvement. It should be noted that this is a small series. Although authors included age- and sex-matched cases undergoing standard TAA to compare the functional gain between the two groups, the comparison of outcome may not be entirely valid. Unfortunately, authors did not report complications or radiological outcome. Despite the unusual nature of the procedure, the indications for surgery in the combined TAA group are not fully described. A total talar replacement essentially represents TAA, along with hemiresurfacing of the subtalar and the talonavicular joints. It would have been useful if the authors had elaborated further technical details as to how they achieved stability of the talar component without resorting to any types of ligament reconstruction or augmentation. In this regard, future studies should also look at gait analysis and biomechanics of TAA with total talar replacement. It is difficult to agree with the authors’ conclusion that combined TAA resulted in better clinical results than standard TAA, as such little data is presented here. However, the paper is promising in its reporting of TAA in a difficult group of patients with inadequate talar bone stock. Improvement in technology has made the planning and design of custom-made implants easily available, and one can envisage increasing use of this technology in the coming days. Considering that the current option is mostly limited to

hindfoot fusion in this group of patients, combined TAA – if it proves durable in the long run – would be a useful progression.

Removal of implants in the foot and ankle: not necessary

■ Practice still varies in the orthopaedic community regarding implant removal (IR) following fracture fixation below the level of the knee. In some settings, the removal of metalware is routine. In the absence of much data one way or the other, good-quality research investigating the benefits and risks of such a common procedure would be welcome. This paper from **Amsterdam (The Netherlands)** seeks to explore the functional and quality-of-life outcome of patients undergoing IR below the level of the knee following fracture fixation.² The prospective series is part of a large cohort of patients recruited for a randomized controlled trial called the WIFI (Wound Infection Following Implant Removal below the Knee) trial. The remit of the original trial was to assess the effect that a single dose of prophylactic antibiotics administered prior to IR had on the risk of surgical site infection (SSI) in patients who previously underwent fracture fixation below the knee. This substudy reports the outcomes of 179 patients. Quite correctly, the authors excluded patients who had Kirschner wire fixation or IR within six months of surgery, as well as patients for whom the interval between fracture fixation and IR was unknown. The median time to IR was around a year. Pain was the most common reason for IR (83%) and functional problems