

**SHORT COMMUNICATION**

# Recent Advances in Orthopedic Surgery for Sports Injuries

E. Carlos Rodriguez-Merchan, MD, PhD<sup>1</sup>*Research performed at Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain**Received: 01 February 2022**Accepted: 09 November 2022***Abstract**

This article reviews the most recent information on the orthopedic surgical treatment of locomotor system injuries in various anatomical areas: shoulder, hip, knee and ankle injuries. It summarizes the results of recent major studies published in the last three years (2020-2022) on sports injuries of the shoulder, hip, knee and ankle.

**Level of evidence:** III**Keywords:** Ankle, Hip, Knee, Injuries, Orthopedic surgery, Shoulder, Sports**Introduction**

Sports injuries requiring the intervention of orthopedic surgeons are very common. This article therefore reviews the most recent information on the orthopedic surgical treatment of locomotor system injuries in various anatomical areas.<sup>1-15</sup>

**Shoulder Injuries****Arthroscopic Rotator Cuff Repair****Suture Tape versus Conventional Suture**

A recent systematic review found that although suture tapes are biomechanically superior, their re-tear and postoperative function rates were similar to those of conventional sutures.<sup>1</sup>

**Large-to-massive Rotator Cuff Tears****Surgical Treatment versus Non-surgical Treatment**

A multicentre, level 2 evidence study found that at 3 months, the patients in the non-surgical group had superior outcomes; over time, however, the surgically treated patients achieved superior results on the American Shoulder and Elbow Surgeons and the Shoulder Pain and Disability Index scales.<sup>2</sup>

**Arthroscopic Rotator Cuff Repair versus Posterior Interval Slide and Partial Repair**

According to Jeong et al partial repair appeared to be superior to complete repair.<sup>3</sup>

**Graft Bridging versus Superior Capsular Reconstruction**

Lin et al observed improved clinical outcomes in both groups but were greater in the graft bridging group.<sup>4</sup>

**First-time Shoulder Dislocation****Arthroscopic Bankart Repair versus Arthroscopic Washout**

Yapp et al found a significantly higher rate of recurrent dislocation in the arthroscopic washout group (47%) than in the arthroscopic Bankart repair group (12%).<sup>5</sup>

**Recurrent Shoulder Instability****Latarjet Procedure: Longitudinal Split of the Subscapularis versus Vertical Tenotomy**

A retrospective, level 3 evidence study demonstrated that the longitudinal split of the subscapularis muscle is a safe technique that results in faster functional recovery and return to sporting activity than vertical tenotomy.<sup>6</sup>

**Corresponding Author:** E. Carlos Rodriguez-Merchan, Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain  
Email: ecrmerchan@hotmail.com



THE ONLINE VERSION OF THIS ARTICLE  
ABJS.MUMS.AC.IR

**Table 1. Relevant information on sports injuries of the shoulder treated by orthopedic surgery**

AUTHORS [REFERENCE]	YEAR	TYPE OF INJURY	RELEVANT INFORMATION
Boksh et al [1]	2022	Arthroscopic rotator cuff tears	Suture tapes are biomechanically superior. However, their re-tear and postoperative function rates were similar to those of conventional sutures.
Song et al [2]	2020	Large-to-massive rotator cuff tears	At 3 months, non-surgical treatment led to better results, although over time, surgical patients achieved better outcomes.
Jeong et al [3]	2020	Large-to-massive rotator cuff tears	Partial repair (posterior interval slide and partial repair) appears to be more advisable than full repair (arthroscopic rotator cuff repair).
Lin et al [4]	2020	Large-to-massive rotator cuff tears	Clinical outcomes were better using graft bridging than using superior capsular reconstruction.
Yapp et al [5]	2020	First-time shoulder dislocation	Arthroscopic Bankart repair provided superior results to arthroscopic wash-out.
Aurich et al [6]	2021	Recurrent shoulder instability	Longitudinal splitting of the subscapularis is a safe technique that resulted in faster functional recovery and return to sporting activity than vertical tenotomy.
MacDonald et al [7]	2020	Pathology of the long head of the biceps tendon	Biceps tenodesis and biceps tenotomy yielded similar results.

### ***Pathology of the Long Head of the Biceps Tendon Biceps Tenodesis versus Biceps Tenotomy***

After a minimum follow-up of 2 years no differences were found in the subjective and objective outcome scores. The only significant difference between the groups was the incidence of cosmetic Popeye deformity, which was associated with a 3.5-fold higher risk after tenotomy than after tenodesis.<sup>7</sup>

[Table 1] summarises the most important information on sports shoulder injuries treated by orthopedic surgery.<sup>1-7</sup>

### **Hip Injuries**

#### ***Femoroacetabular Impingement (FAI)***

#### ***Hip Arthroscopy versus Non-surgical Treatment (Physiotherapy)***

A systematic review showed that after a mean follow-up of 10 months patients with FAI treated with hip arthroscopy had superior short-term outcomes than those treated with physiotherapy alone.<sup>8</sup>

### **Knee Injuries**

#### ***Anterior Cruciate Ligament (ACL) Rupture Should Primary ACL Reconstruction be Augmented with Lateral Extra-articular Tenodesis or Anterolateral Ligament Reconstruction?***

A comparative study found adding lateral extra-articular tenodesis to ACL reconstruction (single-bundle hamstring autograft) reduced the rate of ACL reconstruction failure at 2 years after surgery.<sup>9</sup>

#### ***Does Platelet-rich Plasma (PRP) Improve the Results of ACL Reconstruction?***

A systematic review demonstrated no long-term effects for PRP use in ACL reconstructions.<sup>10</sup>

Another systematic review and meta-analysis by Davey et al. demonstrated that, with the best currently available evidence, PRP does not improve the results of ACL reconstruction with autograft or allograft.<sup>11</sup>

#### ***Allograft versus Autograft Tendons in ACL Reconstruction***

In a retrospective case-control study, 94 patients were divided into two groups: those who received allografts and those who received autografts. Both groups had almost the same functional outcomes after a mean follow-up of 10 years, indicating that fresh-frozen allografts appear to be a reasonable alternative for ACL reconstruction.<sup>12</sup>

### **Meniscal Tears**

#### ***Repair of Bucket Handle Meniscal Tears: All-inside Arthroscopic Technique versus Standard Inside-out Technique***

A systematic review by Ardizzone et al. compared all-inside arthroscopic techniques for the repair of bucket handle meniscal tears with standard inside-out repairs. After a mean follow-up of 1 year no significant differences between the two study groups were evident.<sup>13</sup>

[Table 2] summarises the most important information on sports injuries of the knee treated by orthopaedic surgery.<sup>9-12</sup>

### **Ankle Injuries**

#### ***Acute Achilles Tendon Rupture***

#### ***PRP Injections versus Placebo Injections in Non-surgically Treated Ruptures***

In a prospective, double-blinded, randomised, controlled trial, patients were treated with 4 injections

**Table 2. Relevant information on sports injuries of the knee treated by orthopedic surgery.**

AUTHORS [REFERENCE]	YEAR	TYPE OF INJURY	RELEVANT INFORMATION
Getgood et al [9]	2020	ACL rupture	Adding lateral extra-articular tenodesis to ACL reconstruction (single-bundle hamstring autograft) reduced the failure rate of ACL reconstruction 2 years after surgery.
Davey et al [11]	2020	ACL rupture	PRP does not improve the results of ACL reconstruction with autograft or allograft.
Ardizzone et al [13]	2020	Bucket handle meniscal tears	No differences have been found between all-inside the arthroscopic technique and the standard inside-out technique.
Bistolfi et al [12]	2021	ACL rupture	Fresh-frozen allografts seem a reasonable alternative to autografts for ACL reconstruction.
McRobb et al [10]	2022	ACL rupture	/ Long-term effects were not demonstrated suggesting the influence of PRP is limited.

ACL, anterior cruciate ligament; PRP, platelet-rich plasma.

(of PRP or saline solution placebo) on the first 4 days after injury and with subsequent injections at 2-week intervals. PRP did not improve outcomes in non-surgically treated Achilles tendon ruptures.<sup>14</sup>

#### **Ankle Fracture**

#### **Early Weight bearing versus No Weight Bearing after Surgical Treatment of an Ankle Fracture**

A randomised controlled trial (level 1 of evidence) observed that early weight bearing after surgical

treatment of an unstable ankle fracture was non-inferior to no weight bearing in terms of the Olerud-Molander Ankle Score at 12 months post-injury.<sup>15</sup>

E. Carlos Rodriguez-Merchan MD PhD<sup>1</sup>  
1 Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain

### References

- Boksh K, Haque A, Sharma A, Divall P, Singh H. Use of suture tapes versus conventional sutures for arthroscopic rotator cuff repairs: a systematic review and meta-analysis. *Am J Sports Med* 2022;50(1):264-72. doi: 10.1177/0363546521998318.
- Song A, DeClercq J, Ayers GD, et al. Comparative time to improvement in nonoperative and operative treatment of rotator cuff tears. *J Bone Joint Surg Am* 2020;102(13):1142-50. doi: 10.2106/JBJS.19.01112.
- Jeong JY, Kim SJ, Yoon TH, Eum KS, Chun YM. Arthroscopic repair of large and massive rotator cuff tears: complete repair with aggressive release compared with partial repair alone at a minimum follow-up of 5 years. *J Bone Joint Surg Am* 2020;102(14):1248-54. doi: 10.2106/JBJS.19.01014.
- Lin J, Sun Y, Chen Q, Liu S, Ding Z, Chen J. Outcome comparison of graft bridging and superior capsule reconstruction for large to massive rotator cuff tears: a systematic review. *Am J Sports Med*. 2020; 48(11):2828-38. doi: 10.1177/0363546519889040.
- Yapp LZ, Nicholson JA, Robinson CM. Primary arthroscopic stabilization for a first-time anterior dislocation of the shoulder: long-term follow-up of a randomized, double-blinded trial. *J Bone Joint Surg Am* 2020; 102(6):460-7. doi: 10.2106/JBJS.19.00858.
- Aurich M, Hofmann GO, Best N. Clinical outcome and return to sports activity after surgical treatment for recurrent shoulder instability with a modified Latarjet procedure. *Orthop Traumatol Surg Res* 2021; 107(5):102977. doi: 10.1016/j.otsr.2021.102977.
- MacDonald P, Verhulst F, McRae S, et al. Biceps tenodesis versus tenotomy in the treatment of lesions of the long head of the biceps tendon in patients undergoing arthroscopic shoulder surgery: a prospective double-blinded randomized controlled trial. *Am J Sports Med* 2020;48(6):1439-49. doi: 10.1177/0363546520912212.
- Dwyer T, Whelan D, Shah PS, Ajrawat P, Hoit G, Chahal J. Operative versus nonoperative treatment of femoroacetabular impingement

- syndrome: a metaanalysis of short-term outcomes. *Arthroscopy* 2020; 36(1):263-73. doi: 10.1016/j.arthro.2019.07.025.
9. Getgood AMJ, Bryant DM, Litchfield R, et al. Lateral extra-articular tenodesis reduces failure of hamstring tendon autograft anterior cruciate ligament reconstruction: 2-year outcomes from the STABILITY study randomized clinical trial. *Am J Sports Med* 2020; 48(2):285-97. doi: 10.1177/0363546519896333.
  10. McRobb J, Kamil KH, Ahmed I, Dhaif F, Metcalfe A. Influence of platelet-rich plasma (PRP) analogues on healing and clinical outcomes following anterior cruciate ligament (ACL) reconstructive surgery: a systematic review. *Eur J Orthop Surg Traumatol*. 2022 Jan 12. doi: 10.1007/s00590-021-03198-4. Online ahead of print.
  11. Davey MS, Hurley ET, Withers D, Moran R, Moran CJ. Anterior cruciate ligament reconstruction with platelet-rich plasma: a systematic review of randomized control trials. *Arthroscopy* 2020; 36(4):1204-10. doi: 10.1016/j.arthro.2019.11.004.
  12. Bistolfi A, Capella M, Guidotti C, et al. Functional results of allograft vs. autograft tendons in anterior cruciate ligament (ACL) reconstruction at 10-year follow-up. *Eur J Orthop Surg Traumatol* 2021; 31(4):729-35. doi: 10.1007/s00590-020-02823-y.
  13. Ardizzone CA, Houck DA, McCartney DW, Vidal AF, Frank RM. All-inside repair of bucket-handle meniscal tears: clinical outcomes and prognostic factors. *Am J Sports Med*. 2020; 48(13):3386-93. doi: 10.1177/0363546520906141.
  14. Boesen AP, Boesen MI, Hansen R, et al. Effect of platelet-rich plasma on nonsurgically treated acute Achilles tendon ruptures: a randomized, double-blinded prospective study. *Am J Sports Med*. 2020; 48(9):2268-76. doi: 10.1177/0363546520922541.
  15. Park JY, Kim BS, Kim YM, Cho JH, Choi YR, Kim HN. Early weightbearing versus nonweightbearing after operative treatment of an ankle fracture: a multicenter, noninferiority, randomized controlled trial. *Am J Sports Med*. 2021; 49(10):2689-96. doi: 10.1177/03635465211026960.