

Doctor Albert Lin: the fascination of shoulder surgery and sports medicine

Received: 09 August 2017; Accepted: 07 September 2017; Published: 18 September 2017.

doi: 10.21037/aoj.2017.09.01

View this article at: <http://dx.doi.org/10.21037/aoj.2017.09.01>

Dr. Albert Lin (*Figure 1*) is an Assistant Professor of Orthopedic Surgery at the University of Pittsburgh School of Medicine. Dr. Lin specializes in Shoulder Surgery and Sports Medicine. He has extensive experience in arthroscopy, shoulder arthroplasty, and complex reconstructive and open surgery of the shoulder. He currently serves as the head orthopedic team physician for Duquesne University as well as the head team physician for several Pittsburgh area high schools including Pittsburgh Central Catholic High School.

Dr. Lin graduated magna cum laude from Harvard University in 2001 and earned his medical degree from Harvard Medical School in 2005. He completed his general surgery internship at Brigham and Women's Hospital and finished his orthopedic residency at the Harvard Combined Orthopedic Residency Program in 2010. Following residency, he completed two fellowships in Sports Medicine at the University of Pittsburgh Medical Center in 2011 and Shoulder Surgery at Harvard University in 2012. During his time as a shoulder fellow, Dr. Lin traveled to Lyon, France to train under the mentorship of Dr. Gilles Walch.

Dr. Lin's major research interests lie in shoulder stabilization, rotator cuff repair, reconstructive options in end-stage rotator cuff disease, as well as shoulder arthroplasty. His current research includes clinical outcomes studies, and collaborative studies with the Orthopedic Robotics Laboratory, Bioengineering Department, and the Biodynamics Laboratory at the University of Pittsburgh. Dr. Lin has published more than 50 peer-reviewed articles, abstracts, and book chapters. He serves on the faculty of the American Orthopaedic Society of Sports Medicine, American Academy of Orthopaedic Surgeons, MidAtlantic Shoulder and Elbow Society, is an active member of the American Shoulder and Elbow Society, and regularly presents his research at national and local meetings. He was awarded the O'Donoghue Sports Injury Award by AOSSM in 2011.

It was an honor to meet Dr. Albert Lin during the



Figure 1 Doctor Albert Lin.

11th Biennial ISAKOS Congress in Shanghai, China. I invited him for an interview which including sharing his experiences with shoulder surgery and sports medicine, clinical applications of his research and his thoughts on reconstructive and arthroscopic procedures. We also discussed ongoing cutting edge research being performed at the Orthopedic Robotics Laboratory in Pittsburgh. At the end of the interview, Dr. Lin provided advice on maintaining shoulder function and protection from injury.

Interview

Why specializing in shoulder surgery

Dr. Albert Lin considers shoulder a fascinating joint in the body due to its complexity, degree of motion, and the equal contributions from both bone and soft tissue. The interplay between these two has always intrigued him. The shoulder also overlaps very well with the field of sports medicine and a more traditional shoulder practice. His patients include the young athlete with sports-related injuries, and

the elderly with arthritis requiring joint replacement and complex reconstructions.

The applications and deficiencies of reconstructive procedures

Dr. Lin and his colleagues have dedicated themselves to the concept of restoring native anatomy. As is the case with other joints in the body, shoulder function is optimized when anatomy is retained. Reconstruction of the shoulder should only be considered when pathology is beyond anatomic restoration, for example, large defects of the glenoid in the context of shoulder instability, or with massive irreparable rotator cuff tears. Many methods of shoulder reconstruction provide excellent clinical outcomes such as the Latarjet procedure and the reverse total shoulder replacement. However, all reconstructions by nature will never fully retain or restore normal anatomy. Usually, this will have some downstream effect over time. When possible, the goal is always anatomic repair. If anatomic repair is not possible, reconstructive options should try to mimic normal biomechanics and anatomy as closely as possible.

The benefits of open shoulder surgery

In Dr. Lin's opinion, shoulder arthroscopy, for better or worse, has become so commonplace and advanced that it has essentially become the gold standard for most sports surgeons. The majority, if not all, sports fellowships train surgeons in arthroscopy far more than open procedures. He believes all shoulder surgeons should be proficient in both open and arthroscopic surgery. Open surgery typically benefits arthroscopic understanding, and vice versa.

Open surgery should still play an important role in the repertoire of the shoulder surgeon. For example with shoulder instability, there are certain scenarios where an arthroscopic approach may not necessarily be the optimal solution. Certain patients have a higher known risk for failure following arthroscopy surgery. These patients include young patients, patients who play contact sports, who have shoulder laxity and so on. These patients may have a higher rate of failure, as high as 15% to 20% in some studies, despite a technically well-done arthroscopic procedure. At national and international conferences such as ISAKOS, there is a recurring theme regarding the return to open surgery as potentially a primary surgery in these situations. Though it remains controversial, many surgeons advocate for primary open Bankart repair or Latarjet

procedure due to lower rates of recurrence. In other instances, open surgery may be a better option in a revision scenario to elicit a more robust biologic healing response such as revision rotator cuff repair following an early failure of an arthroscopic repair. From Dr. Lin's perspective, open surgery should be mastered by every orthopedic shoulder surgeon. Under certain scenarios, open surgery is the superior option.

The benefits of having an orthopedic robotics laboratory

Dr. Lin believes one of the benefits of studying robotics is that injury patterns can be recreated very specifically. For instance, he and his colleagues are currently studying the injury patterns of the capsule and the amount of deformity created during multiple shoulder dislocations. Very specific information including direction, magnitude, and amount of non-recoverable injury can be identified. No studies in the past have addressed every parameter of capsular injury in such detail. This information will be used to provide further details on approach and methods of surgical repair and hopefully to improve clinical outcome. As good as shoulder instability surgery is, the failure rate remains high. The goal of stabilization is to drop recurrence to zero. One of the reasons that failures occur may be that the area of injury goes beyond what is anticipated. For example, the injury during anterior instability may go beyond the anterior labrum and capsule. In fact, Dr. Lin and colleagues are learning that the irreversible damage during multiple anterior dislocations may be present in the posterior capsule as much as in the anterior capsule. This can have bearings on anatomic repair and also the success of surgery. Through laboratory and robotics research, cutting edge technology is being used to further understanding of pathology and treatment.

Advice for the prevention of shoulder injuries and pathology

In Dr. Lin's view, many injuries occur from a lack of education regarding prevention. For instance, dislocation risks in contact athletes may be prevented from engaging shoulder girdle strengthening, rotator cuff strengthening and strengthening of scapular stabilizers. Likewise, patients at risk for rotator cuff tears should be educated on minimizing heavy lifting about shoulder level or activities that put undue burden on the rotator cuff. Following surgery, more return to play protocols may be necessary to help prevent recurrent injuries after surgery and to make

sure that an athlete is cleared before resuming full play.

In other instance, some degenerative processes may be unpreventable such as degenerative rotator cuff tears or arthritis. These are often attributed to wear and tear and aging. The future holds great promise on stem cells, PRP (platelet rich plasma), and other different biologics. Dr. Lin believes that the next frontier in medicine is regenerative medicine and preventing pathology normally attributed to aging.

Lastly post-injury education is also important. Some patients may be considered for therapy, while others may required surgery immediately in order to prevent further issues. Although we may not still fully understand who is optimally treated with conservative management versus surgery, identifying the appropriate treatment course will also prevent further injuries as well.

Acknowledgments

On behalf of the editorial office of *Annals of Joint (AOJ)*, I would like to extend my gratitude to Dr. Lin for sharing his opinions with us. I would also like to thank my colleague, Chengying Lin, for her assistance in revising the interview.

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned

by the Editorial Office, *Annals of Joint* for the series “Meet the Professor”. The article did not undergo external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/aoj.2017.09.01>). The series “Meet the Professor” was commissioned by the editorial office without any funding or sponsorship. SXW reports that she is a full-time employer of AME Publishing Company (publisher of the journal). The author has no other conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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(Science Editor: Sucsy X. Wu, AOJ, aoj@amegroups.com)

doi: 10.21037/aoj.2017.09.01

Cite this article as: Wu SX. Doctor Albert Lin: the fascination of shoulder surgery and sports medicine. *Ann Joint* 2017;2:56.