English Lectures & Papers 4 "Tennis elbow/ Arthroscopy"

Feb. 3rd (Fri) 13:55~14:55
Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Lectures 4 (L4-1)

Lateral epicondylitis: Epidemiology, Pathophysiology, and Treatment

Takuro Wada
Saiseikai Otaru Hospital, Japan

Lateral epicondylitis or tennis elbow (TE) is the most common cause of lateralsided elbow pain. TE is a self-limiting condition; 80% to 90% resolve between six to 12 months with a wait-and-see policy and avoidance of aggravating activities. However, symptoms can last over 6- 12 months in recalcitrant cases. The etiology of TE is assumed to be enthesopathy of ECRB origin. In the acute phase, TE might be an inflammatory process of the tendon including edema and inflammatory cells that has damaged by micro-trauma. In the chronic phase (recalcitrant tennis elbow), the histological picture is characterized by dense populations of fibroblasts, vascular hyperplasia, disorganised collagen, lack of inflammatory cells, that is termed angiofibroblastic hyperplasia. Intra-articular pathology such as plica, synovitis and degeneration of articular cartilage is also involved. Regarding treatment of acute phase of TE, the aim is relief of pain and inflammation followed by induction of natural healingof the damaged tendon. A forearm band and stretching of the wrist and finger extensor is indicated. In the subacute phase, extracorporeal shock wave treatment and platelet rich plasma injections (PRP) can be chosen as a treatment option. Surgical intervention should be reserved for recalcitrant patients with persisting symptoms in daily life after failure of conservative treatment. Current RCTs and systematic reviews indicate that classic open surgery and arthroscopic surgery provide similar functional results and pain reduction for the treatment of tennis elbow. I prefer arthroscopic surgery. One advantage is the capability of the surgeon to fully assess the elbow intra-articularly. Second, the incision is often considered less appealing to both patients and surgeons than portal-site incisions.

【Curriculum Vitae】

1984	Graduated Sapporo Medical University, School of Medicine
1988-1990	Postdoc Research Fellow University of Pennsylvania, Philadelphia, PA
2000-2014	Associate Professor, Department of Orthopaedic Surgery, Sapporo Medical University
2010-2014	Professor, Department of Regional Health Care and Medicine, Sapporo Medical University
2017-present	Director, Saiseikai Otaru Hospital, Otaru, Japan

Oversea Fellowship:
University of Calgary, 2000/ Oct
AAOS-JOA Travelling Fellowship, 2002/ Feb

Professional MEMBERSHIPS:
Japanese Orthopaedic Association
Japanese Society for Surgery of the Hand, Council Member
Japan Elbow Society, Council Member, President of the 31st Annual Meeting, 2019
Japanese Society of Reconstructive Microsurgery, Council Member
American Society of Surgery of the Hand, International Member

English Lectures & Papers 4 "Tennis elbow/ Arthroscopy"

Feb. 3rd (Fri) 13:55～14:55
Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Lectures 4 (L4-2)

Arthroscopic Treatment of Elbow Arthritis

Scott P. Steinmann
University of Tennessee College of Medicine, USA

Elbow arthroscopy has become a more common procedure over the past several years. Arthroscopic evaluation of the elbow joint was described initially by Burman1 in 1931 as "unsuitable for examination and that the anterior puncture of the elbow is out of the question." Since that time, as arthroscopic equipment has improved, different investigators have reported their initial results of arthroscopic inspection of the elbow joint. Presently, elbow arthroscopy is being used more frequently for a variety of clinical conditions. It has proven to be an effective method of treatment for elbow disorders such as contracture release, which previously had been performed only via open surgical approaches. Elbow arthroscopy is technically demanding and requires a surgeon who is experienced in advanced arthroscopic techniques. Potential advantages of arthroscopic treatment include improved articular visualization and decreased postoperative pain. Patients also may benefit from a decreased morbidity and a faster postoperative recovery. Presently, elbow arthroscopy can be performed for removal of loose bodies, resection of symptomatic plicae, release of capsule in patients with contractures, removal of osteophytes, synovectomy in inflammatory arthritis, treatment of osteochondritis dissecans, debridement of lateral epicondylitis, and treatment of elbow fractures. Elbow arthroscopy remains challenging because of the small joint working space and the unique articular anatomy of the elbow.
The close proximity of major neurovascular structures is perhaps the greatest concern of most orthopedic surgeons. With a sound knowledge of the articular and regional anatomy of the elbow, safe elbow arthroscopy can be learned and practiced by most orthopedic surgeons.

【Curriculum Vitae】

Leadership and Service Experience
- Assistant Dean of Multidisciplinary Graduate Medical Education, University of Tennessee College of Medicine, Chattanooga Tennessee, 2021- Present
- Chair, Orthopedic Surgery, University of Tennessee, Chattanooga 2019-2021
- Emeritus Professor of Orthopedic Surgery, Mayo Clinic, Rochester MN 2019- present
- Chair, AAOS BOS Fellowship Committee 2021-present
- Member, AAOS Council on Education 2020- present
- Chair AAOS Shoulder and Elbow Content Committee 2020-present
- Chair, ASES Fellowship Committee 2017-present
- ASES Liaison, AAOS BOS Fellowship Committee 2016-present

Curriculum and Educational Development
- Co-Chair, AANA Elbow and Wrist Arthroscopy, Rosemont OLC, 2009
- Co-Chair, Mayo Clinic Shoulder and Elbow Course, 2004 – 2022
- Co-Chair, ASSH, Advanced Techniques in Elbow Surgery, Rosemont OLC, 2005
- Co-Chair, ASSH, Elbow/Wrist Arthroscopy Course, Rosemont OLC, 2006
- Chair, ASSH Curriculum Steering Committee 2010
- Chair, ASSH, Advanced Techniques in Reconstructive Elbow Surgery, Rosemont OLC, 2011
- Chair, ASSH, There is an Elbow. You must fix it. Pre-Course 2012
- Co-Chair, ASES/AAOS Elbow Reconstruction Course, Rosemont OLC, 2010
- Co-Chair, ASES/AAOS Elbow Reconstruction Course, Rosemont OLC, 2012
- Co-Chair, ASSH, Advanced Techniques in Reconstructive Elbow Surgery, Rosemont OLC, 2013
- Co-Chair, VuMedi-The Event, Shoulder and Elbow section, San Francisco, 2015
- Co-Chair, AANA, Elbow Arthroscopy, Reconstruction and Arthroplasty, Rosemont OLC, 2015
- Co-Chair, AANA, Advanced Shoulder and Elbow course, Rosemont OLC, 2016
- Co-Chair, AAOS/ASSH, General Orthopedic Review Course, Chicago 2016
- Co-Chair, AANA, Popular Solutions in Shoulder/Elbow Surgery course, Rosemont, OLC 2018
- 171 papers published, 107 book chapters, 9 books edited
- >700 national and international podium presentations
- Moderator of multiple ICLs and curriculum development over the past decades for AAOS, AASH, AAHS, and ASES

English Papers 4 "Tennis elbow/ Arthroscopy"

Feb. 3rd (Fri) 14:55～15:10
Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Papers 4 (L4-3)

Experimental pilot study for augmented reality-enhanced elbow arthroscopy

Michiro Yamamoto[1], Shintaro Oyama[2], Hiroaki Iwase[1], Yukimi Murakami[1], Hitoshi Hirata[1], Hideo Yokota[3]

[1]Department of Hand Surgery, Nagoya University, Japan,
[2]Innovative Research Center for Preventive Medical Engineering, Japan,
[3]RIKEN Center for Advanced Photonics, Image Processing Research Team, Japan

The purpose of this study was to develop and evaluate a novel elbow arthroscopy system with superimposed bone and nerve visualization using preoperative computed tomography (CT) and magnetic resonance imaging (MRI) data. We obtained bone and nerve segmentation data by CT and MRI, respectively, of the elbow of a healthy human volunteer and cadaveric Japanese monkey. A life size 3-dimensional (3D) model of human organs and frame was constructed using a stereo-lithographic 3D printer. Elbow arthroscopy was performed using the elbow of a cadaveric Japanese monkey. The augmented reality (AR) range of error during rotation of arthroscopy was examined at 20 mm scope– object distances. We successfully performed AR arthroscopy using the life-size 3D elbow model and the elbow of the cadaveric Japanese monkey by making anteromedial and posterior portals. The target registration error was 1.63 ± 0.49 mm (range 1–2.7 mm) with respect to the rotation angle of the lens cylinder from 40° to − 40°. We attained reasonable accuracy and demonstrated the operation of the designed system. Given the multiple applications of AR-enhanced arthroscopic visualization, it has the potential to be a next-generation technology for arthroscopy. This technique will contribute to the reduction of serious complications associated with elbow arthroscopy.

English Papers 4 "Tennis elbow/ Arthroscopy"

Feb. 3rd (Fri) 14:55～15:10
Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Papers 4 (L4-4)

Lateral Ulnar Collateral Ligament of the Elbow Joint Reconsideration of Anatomy in Terms of Connection with Surrounding Fibrous Structure

Atsuhiro Fukai[1], Akimoto Nimura[2], Masahiro Tsutsumi[3], Hitomi Fujishiro[4], Koji Fujita[2], Junya Imatani[5], Keiichi Akita[1]

[1]Department of Clinical Anatomy, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Japan,
[2]Department of Functional Joint Anatomy, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Japan,
[3]Inclusive Medical Science Research Institute, Morinomiya University of Medical Sciences, Japan,
[4]Department of Anatomical and Physiological Science, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Japan,
[5]Department of Orthopaedic Surgery, Okayama Saiseikai General Hospital, Japan

To improve the clinical results of lateral ulnar collateral ligament (LUCL) reconstruction, better understanding of the anatomy could be relevant. In the past anatomical study, LUCL has been interpreted as the posterior fibers of the LCL originates from the lateral epicondyle of the humerus, inserts anterior and posterior to the radial notch with a fan-like shape. However, in late years it has been reported that ligament is a part of the periarticular aponeurosis and joint capsule. This study considers the previously described anatomy of the LUCL in relation to the related aponeuroses and joint capsule.

Twenty-four elbows from 21 embalmed cadavers were included in the study. Twenty elbows were studied macroscopically and 4, histologically. During macroscopic analysis, local thickness of periarticular tissue was measured using micro-CT.

The supinator aponeurosis and joint capsule intermingled to form a thick membrane, which we termed “the capsulo-aponeurotic membrane: CAM.” The CAM was thicker than the anterior and posterior parts of the capsule of the humeroradial joint. The CAM had a wide attachment on the distal part of the extensor digitorum communis origin of the humerus, the lateral part of the coronoid process, and the posterior part of the radial notch of the ulna. The deep aponeuroses of the EDC and extensor carpi ulnaris (ECU) were connected to the posterior part of CAM, which appear as band-like structures. These bands could be interpreted as the LUCL. In other words, the LUCL could be interpreted as intimately working with joint capsule and these muscles as a “static-dynamic stabilizer.” In addition, damage to the thin anterior part and expansion to the posterior thick part of the CAM could explain the correlation between instability and development of lateral epicondylitis.

These anatomical findings could provide useful clues for improvement in techniques of LUCL reconstruction and lateral epicondylitis pathology.