
English Lectures & Papers 3 "Elbow fracture/ Dislocation"

Feb. 3rd (Fri) 11:10~12:10

Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Lectures 3 (L3-1)



Current concept of complex elbow instability -From anatomy to treatment-

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Complex elbow instability is defined as the combination of several fractures of the elbow joint and ligamentous injuries. The primary goal of the treatment for these injuries is to restore sufficient elbow stability to allow early motion exercise within a stable elbow arc of motion. However, there is an insufficient consensus on its diagnosis and treatment strategy. In this Web-Lectures over Elbow Surgery, I would focus on the functional anatomy of the elbow joint related complex elbow instability, its preoperative diagnosis and current treatment strategy.

First, the functional anatomy of the elbow joint obtained from combined research with the Department of Clinical Anatomy, Tokyo Medical and Dental University is presented on the lateral / medial collateral ligament complex and the anterior capsular ligamentous complex around ulnar coronoid process.

Next, regarding to the preoperative diagnosis, in addition to X-rays and CT scan images are important for evaluation of bony lesions and the static and dynamic stress tests under fluoroscopy like as the hanging arm test during surgery should also be performed to evaluate its degree of instability and pathophysiology.

The treatment strategy for complex elbow instability like as terrible triad injury is based on two main objectives: the restoration of bony stabilizing structures and the repairment of ligamentous stabilizing structures including the lateral / medial collateral ligament complex and the anterior capsular ligamentous complex. By presenting some clinical cases and reviewing the literatures, I would present the current treatment strategy for this instability.

【Curriculum Vitae】

1988 Kagawa University Medical School
1988 Okayama University Medical School, Dept. of Orthop. Surg.
1994 Okayama Saiseikai General Hospital, Dept. of Orthop. Surg.
1996 Niigata Hand Surgery Foundation, Clinical Fellow
2007 JSSH & ASSH International Fellow
2013 Tokyo Medical and Dentistry University, Lecturer
2017 Okayama University Medical School, Clinical Prof.
2019 Okayama Saiseikai General Hospital, Vice President

Professional affiliation and activities:

International Federation of the Societies for Surgery of the Hand: Member
Orthopaedic Trauma Association: Active member
Japanese Societies for Surgery of the Elbow: Vice president
Japanese Societies for Fracture Repair: Vice president
Japanese Societies for Surgery of the Hand: Councilor
Japanese Wrist Surgery Workshop: Councilor, President (2016)

Reviewer:

Journal of Orthopaedic Science: Editorial Board Member
Bone & Joint Research: Reviewer Member
Clinical Anatomy: Reviewer Member
Journal of Wrist Surgery: Associated Editor

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English Lectures 3 (L3-2)



Traumatic elbow instability

Michael R. Hausman

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Intractable elbow instability after a fracture/dislocation is a common situation. Effective treatment requires understanding of the soft tissue capsular and ligament injury, in addition to the fracture.

The posterolateral instability problem resulting from rupture of the lateral ulnar collateral ligament, fracture of the radial head and a coronoid anterolateral facet fracture is well recognized. When there is instability, treatment by orif or radial head arthroplasty, possible orif of the coronoid and LUCL repair (or reconstruction in chronic cases) is usually successful.

However, posteromedial instability and “helicopter” instability (resulting in the trochlea “plowing though” the damaged coronoid (like a plow through the winter snows of Hokkaido) is less well understood. Consequently, the condition is frequently not appreciated or misdiagnosed and improper treatment can actually aggravate the instability. Furthermore, new laboratory data suggests that injury to the transverse and posterior bundles of the MCL can cause instability even if the coronoid remains intact.

This presentation discusses our current understanding of elbow instability, emphasizes the role of soft tissue restraints and suggests an algorithm for accurate diagnosis and effective treatment of elbow fractures and dislocations.

【Curriculum Vitae】

Yale College, 1975

Yale Medical School, 1979

Univ. of Colorado, 1979-80 (intern in general surgery)

Yale Medical School/New Haven Hospital, 1981-85; resident, general/orthopedic surgery

Little and Eaton 1985-86, Fellow in Hand Surgery

Current position:

Lippmann Professor of Orthopedics and Chief of Upper Extremity Surgery

Mount Sinai/Icahn School of Medicine, New York City

English Papers 3 (L3-3)

Quantitative Analysis for the Change in Lengths of the Radius and Ulna in Missed Bado Type I Monteggia Fracture

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Background: In missed Monteggia fracture (MMF) cases, ulnar angulation and lengthening by osteotomy are required to reduce the dislocated radial head. This study aimed to clarify the abnormal discrepancy in length between the radius and ulna in MMF. We tested the hypothesis that the increase in the abnormal discrepancy in length between the radius and ulna relates with the duration of radial head dislocation.

Methods: In total, 24 patients with MMF were studied and classified into 2 groups, according to the duration of radial head dislocation, including the early group (n=9, within 3 y) and the long-standing group (n=15, older than 3 y). The lengths of the radius (Lr) and ulna (Lu) were measured. The difference in length between the ulna and radius ($DL = Lu - Lr$) was calculated on both the affected (DLaff) and normal (DLnor) sides. $DLnor - DLaff$, which represented an abnormal discrepancy in both bones, was analyzed for correlation with the duration of radial head dislocation and the age at initial injury.

Results: The affected and normal sides had no differences in the Lr of both the groups and in the Lu of the early group. However, in the long-standing group, Lu was significantly smaller in the affected side than in the normal side ($P=0.001$). In the long-standing group, DLaff was significantly smaller, owing to decreased length of the ulna, than DLnor ($P=0.003$). The $DLnor - DLaff$ was positively correlated with the duration of radial head dislocation and was negatively correlated with the age at injury.

Conclusions: In chronic MMF cases, the length of the ulna was shorter in the affected side than in the normal side. Therefore, ulnar lengthening is necessary to resolve this abnormal discrepancy and reduce the radial head. Because excessive ulnar lengthening has risks of postoperative complications, one of the surgical options is gradual ulnar lengthening or shortening osteotomy of the radius.

English Papers 3 "Elbow fracture/ Dislocation"

Feb. 3rd (Fri) 12:10~12:25

Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Papers 3 (L3-4)

Surgical technique in tension band wiring method for selected comminuted olecranon fractures

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Background: The use of tension band wiring (TBW) for comminuted olecranon fractures is less recommendable these days. However, some experts preferentially apply TBW to comminuted fractures resulting in favorable outcomes. We here present the surgical technique using TBW with eyelet and absorbable pins for selected comminuted olecranon fractures and review the clinical and radiographic outcomes.

Methods: Twenty-four surgically treated patients with Colton Group 2C or 2D olecranon fractures in focus on the intermediate fragment (IMF) were enrolled. IMFs were primarily fixed with buried bioabsorbable poly-L-lactic acid pins followed by definitive fixation of the olecranon process with TBW with eyelet. The adequacy of the reconstructed notch was especially estimated by parameters on radiographs using digital imaging software.

Results: The average follow-up was 30 months (10 to 86 months). All 24 fractures achieved union, and the maintenance of the articular curvature was confirmed according to statistical analysis on radiographs. The average elbow flexion was 135.1°(range 100° to 145°), and the average elbow extension was -4.8° (range -20° to 10°). The mean Mayo Elbow Performance score was 97.3 points (range 80 to 100 points). No cases of pin migration, infection, nerve problem, heterotrophic ossification, or secondary osteoarthritis were observed.

Conclusions: For selected comminuted olecranon fractures, TBW with the eyelet pins and biodegradable pins could yield satisfactory clinical and radiographic outcomes.