English Lectures & Papers 9 "Cubital tunnel syndrome/ Thoracic outlet syndrome"

Feb. 4th (Sat) 15:25～16:25
Room 1 (Yamagin Kenmin Hall 2F Main Hall)

English Lectures 9 (L9-1)

Cubital tunnel syndrome: new evidence proved by English reports from Japan since 2010

Hiroyuki Kato[1,2], Masanori Hayashi[2], Shigeharu Uchiyama[3]

[1]Hand & Upper Extremity Surgery Service, Nagareyama Central Hospital, Japan,
[2]Department of Orthopaedic Surgery, Shinshu University, Japan,
[3]Department of Orthopaedic Surgery, Okaya Municipal Hospital, Japan

Cubital tunnel syndrome (CuTS) or ulnar neuropathy at the elbow (UNE) is frequently encountered in clinical practice by elbow joint surgeons. Unfortunately, the current literature has yet to fully make clear its pathophysiology, reliable diagnosis, optimal surgical treatment, and postoperative chronological subjective and objective evaluation value for CuTS. There have been more than 30 English language papers on CuTS reported from Japan in peer-reviewed international journals since 2010.

In this talk, among them I have introduced 19 papers including 6 of our papers regarding 1) associated pathological elbow lesions, 2) motion and physiology analysis of the ulnar nerve using ultrasonography or MRI, 3) diagnosis for CuTS, 4) strain and vascularity of the ulnar nerve, and 5) surgical techniques, results, and postoperative recurrence, 6) UNE in baseball players.

This talk will help guide the audience through the diagnostic and treatment process for CuTS or UNE.

【Curriculum Vitae】

1979	Graduated, Hokkaido University School of Medicine
1979-88	Resident, Dept, of Ortrhop. Surg, Hokkaido University
1989-90	Assistant professor, Dept Orthop. Surg, Hokkaido University (Associate Prof. Ogino T)
1990-91	Research Fellow, Orthop. Biomechanical Labo. Texas Tech University (Prof. Jaiyoung Ryu).
1991-95	Senior Orthopaedic Surgeon, Kushiro Rousai Hospital
1995-98	Assistant professor, Dept Orthop Surg,, Hokkaido University (Associate Prof. Minami A)
1998-00	Senior Orthopaedic Surgeon, Sapporo West National Hospital
2000-03	Associate professor, Dept Orthop Surg,, Hokkaido University (Prof. Minami A)
2003-18	Professor and Chairman, Dept of Orthop. Surg,, Shinshu University School of Medicine
2018-	Senior, Hand & Upper Extremity Surgery Service, Nagareyama Central Hospital Specially appointed professor, Shinshu University

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English Lectures 9 (L9-2)

Endoscopic surgery in the zero-position for thoracic outlet syndrome

Hiroshi Satake
Department of Orthopaedic Surgery, Yamagata University, Japan

OBJECTIVES
We have hypothesized that an endoscopically assisted transaxillary approach in the zero-position would be able to improve visualization and allow safe surgery for thoracic outlet syndrome (TOS).
METHODS
We performed surgery only for patients with certain objective findings, including blood flow disruption, low blood flow, and accelerated blood flow in the subclavian artery demonstrated using Doppler sonography, narrowing of the scalene interval width between the anterior and middle interscalene muscles (interscalene base) or costoclavicular space demonstrated using Duplex ultrasonography or CT angiography.
The present study included 45 consecutive patients (50 limbs) who underwent endoscopic transaxillary first rib resection with scalenotomy and brachial plexus neurolysis. We assessed the intraoperative parameters, including the interscalene base, blood loss, operation time, patient satisfaction, preoperative and postoperative QuickDASH, and complications.
RESULTS
The mean intraoperatively measured interscalene base width was 6.4 mm. All patients showed improvement after surgery. The outcome was excellent in 40% of cases, good in 48%, fair in 12%, and poor in none. Pneumothorax was present in 6%. There were no other complications and no recurrences. Among patients who had been followed up for at least 2 years, the QuickDASH score was significantly improved (42 before surgery vs. 12 at final follow-up), especially in athletes relative to non-athletes (0.2 vs 16). The present approach achieved complete relief in 43% of cases overall (91% in athletes and 16% in non-athletes).
CONCLUSIONS
Endoscopically assisted transaxillary first rib resection and brachial plexus neurolysis in the zero-position is useful and safe for TOS, especially in athletes.

【Curriculum Vitae】

Graduate: 1999, Yamagata University School of Medicine, Japan (M.D)
Post-Graduate Education: 2007, Yamagata University School of Medicine, Japan (Ph.D)
Employment record:
2000-2007, Yamagata University Hospital, Hakodate National Hospital, Okitama Public General Hospital, Nihonkai General Hospital, Japan
2008-2021, Orthopaedic Surgery, Yamagata University Hospital, Yamagata, Japan
2011, Assistant Professor in the Department of Orthopaedic Surgery, Yamagata University Faculty of Medicine, Japan
2014, Faculty Lecturer in Yamagata University Faculty of Medicine, Japan
2017, Lecturer in the Department of Orthopaedic Surgery, Yamagata University Faculty of Medicine, Japan
2020, Associate Professor in the Department of Orthopaedic Surgery, Yamagata University Faculty of Medicine, Japan
2021, Professor in Yamagata University Hospital, Japan

English Papers 9 "Cubital tunnel syndrome/ Thoracic outlet syndrome"

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English Papers 9 (L9-3)

The ultrasonographic assessment of the morphologic changes in the ulnar nerve at the cubital tunnel

Fumitaka Endo[1], Tsuyoshi Tajika[2], Takuro Kuboi[1], Hirotaka Chikuda[1]

[1]Department of Orthopaedic Surgery, Gunma University Graduate School of Medicine, Japan,
[2]Graduate School of Health Sciences, Gunma University, Japan

Background: We investigated the differences in the prevalence of ulnar nerve instability (UNI) by hand dominance and evaluated the relationship between UNI and morphologic changes in the ulnar nerve and the clinical findings and upper limb function.

Methods: This study examined 153 healthy participants (n = 306 elbows; 44 men, 112 women; mean age 65.4 years) who underwent ultrasonography to assess the ulnar nerve cross-sectional area (UNCSA) at three points of the bilateral cubital tunnel at 30° of elbow flexion. Participants were divided into three groups based on the ultrasonography findings of UNI: no instability (type N), subluxation (type S), and dislocation (type D). For the dominant and nondominant sides, we assessed the relationship between the UNCSA and clinical factors, including the age, gender, height, weight, body mass index, fat mass, grip strength, key pinch strength, UNCSA, and Patient-Rated Elbow Evaluation score.

Results: We identified 75 cases without instability in both elbows and 78 cases with some instability. The prevalence of UNI was 51%. No significant difference was found between hand dominance and the prevalence of UNI. The UNCSA at 1 cm proximal to the medial epicondyle on the bilateral sides in type S was the most increased among three types.

Conclusion: UNI was identified in almost half of the participants, with no marked difference found in the hand dominance. The UNCSA at 1 cm proximal to the medial epicondyle was significantly increased the most in type S. UNI does not appear to be associated with elbow symptoms in the general population.

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English Papers 9 (L9-4)

Dynamic Evaluation of Intraneural Microvascularity of the Ulnar Nerve in Patients with Cubital Tunnel Syndrome

Yuichiro Matsui[1,2], Tatsunori Horie[3], Tadanao Funakoshi[4], Daisuke Kawamura[2], Mutsumi Nishida[5], Norimasa Iwasaki[2]

[1]Section for Clinical Education, Faculty of Dental Medicine, Hokkaido University, Japan,
[2]Department of Orthopaedic Surgery, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Japan,
[3]Department of Radiological Technology, Diagnostic Center for Sonography, Hokkaido University Hospital, Japan,
[4]Department of Orthopaedic Surgery, Keiyu Orthopaedic Hospital, Japan,
[5]Division of Laboratory and Transfusion Medicine, Diagnostic Center for Sonography, Hokkaido University Hospital, Japan

Purpose: To compare intraneural microvascular patterns of the ulnar nerve at 2 elbow flexion angles in asymptomatic volunteers and patients with cubital tunnel syndrome (CuTS) and evaluate the effects of surgery on the microvascular pattern in patients with CuTS using contrast-enhanced ultrasonography (CEUS).
Methods: This study included 10 elbows in 10 asymptomatic volunteers (control group) and 10 elbows in 10 patients with CuTS who underwent anterior subcutaneous transposition of the ulnar nerve (CuTS group). The CuTS group underwent electrophysiologic examinations and CEUS before surgery and at 1, 2, and 3 months after surgery. The intraneural enhancement pattern was calculated as an area under the curve (AUC) value in the entrapment site of the ulnar nerve within the cubital tunnel and in the area 1 cm proximal to the site (proximal site) at elbow flexion angles of 20° and 110°.
Results: Serial electrophysiologic examinations showed improvements at 1, 2, and 3 months after surgery compared with before surgery. In the control group, the AUC of the central part of the cubital tunnel and proximal sites showed no substantial changes with the increase in elbow flexion. In the CuTS group, the AUC in the proximal site at 110° of elbow flexion was decreased compared with that at 20° of flexion before surgery. The AUC for both the entrapment and proximal sites at 20° and 110° of elbow flexion were the most increased at 2 months after surgery compared with before surgery.
Conclusions: In CuTS, increased elbow flexion influences ulnar nerve intraneural blood flow. Surgery for CuTS alters the intraneural blood flow. Quantitative evaluation of this blood flow of the ulnar nerve using CEUS may be a new supplementary diagnostic tool for CuTS and an indicator for evaluation of postoperative recovery from nerve damage.