



The NZ Shoulder and Elbow Society Meeting 2015

Conference Report

NZ Shoulder and Elbow Society

The NZ Shoulder and Elbow Society (NZSES) is a sub-group of the NZ Orthopaedic Association. The NZSES biennial meeting is attended by surgeons from NZ and Australia with a variable level of experience in shoulder and elbow surgery and this year it was held in Rarotonga. The NZSES has an open policy where they encourage members of all levels of expertise to join and attend conferences in an attempt to promote a learning environment for the benefit of patients. All members are encouraged to present at the conference to foster an open learning and supportive environment.

This is the first time the NZ Shoulder and Elbow Society have invited Physiotherapists to attend their biennial meeting. Ten physiotherapists attended (9 from New Zealand and 1 from the USA). Physiotherapists had a dedicated half-day of the 4-day conference in which the majority of the physiotherapists presented short presentations. Physiotherapists were also welcomed to sit in on all other sessions of the NZSES conference.

Conference Format

The conference spanned 4 days, with 2 full days, and two half days allowing time for the delegates to spend time enjoying the sights and activities of Rarotonga with their families, many of whom took advantage of the school-holiday timing. The majority of the conference consisted of keynote presentations (20 mins each), and NZSES member presentations (10 mins each).

The NZSES have a policy that all members contribute to the presentations. After hearing the majority of presentations over the 4 days, I was heartened to see the collegial and supportive nature of this group of surgeons. Several presentations were cases that had poor outcomes, and there was ample discussion time in which other members and keynote speakers offered advice and suggestions on management of specific cases. The physiotherapy profession can learn from this group, particularly in regards to contribution to conference presentations, as well as the value of case presentations, and in particular of cases that don't go well. These present valuable learning opportunities for us all.

My overall sense at the end of the conference was that the NZSES are a strong and collegial organisation who are wanting to actively engage with the physiotherapy profession for the mutual benefit of our patients.



Dr Greg Bain
Professor
Flinders University of
South Australia, Australia

Greg is a former President of the Australian Shoulder and Elbow Society of Australia and deputy chairman of the Upper limb Committee of ISAKOS.

At the Flinders University of South Australia he is Professor of Upper Limb and Research in the Department of Orthopaedic Surgery where he provides Upper limb orthopaedic services to Flinders Medical Centre and the Repatriation General Hospital.

He has presented and published research papers locally and overseas on shoulder and upper limb topics as well as publishing text book chapters on the disorders of the upper limb. He is actively involved in pursuing an anatomically based approach to reconstructive surgery.



Dr Leesa Galatz
Associate Professor
Washington University
St Louis, USA

Dr Galatz is an Associate Professor of Orthopaedic Surgery on the Shoulder and Elbow service at Washington University Orthopaedics, Barnes Jewish Hospital in Saint Louis, MO. Her primary research interest throughout her career has been basic science of rotator cuff disease and tendon to bone healing as it pertains to cuff repair.

Currently a co-investigator on two projects funded by the US National Institute of Health focusing on chronic rotator cuff disease and novel tissue engineering strategies for repair. Her translational research is complemented by clinical studies with the Shoulder & Elbow Service.

Dr Galatz serves as the Fellowship Director for the Shoulder & Elbow Fellowship. She serves as the faculty member in numerous courses on a national and international level, lecturing on both Shoulder & Elbow pathology, encompassing a variety of topics.

She was the recipient of the Neer award for Basic Science Research at the American Shoulder and Elbow Surgeons Open Meeting in 2009. She is the Associate Editor



Dr Eiji Itoi
Professor
Tohoku University School
Medicine; President Japan
Shoulder Society

Prof Eiji Itoi graduated from Tohoku University School of Medicine in 1980. He received a PhD in 1989. He performed extensive biomechanical research at Mayo Clinic Biomechanics Lab in 1990-1993 and 1997-1998. He received Neer Award twice on best research and best clinical studies in 1992 and 2003. Prof Itoi is now the Professor and Chair of Department of Orthopaedic Surgery, Tohoku University School of Medicine. He was the Congress President of ICSES (International Congress on Shoulder and Elbow Surgery) 2013. He served as a Treasurer of ICSES for 9 years. He is now the President of Japan Shoulder Society Orthopedic Association.

for Basic Science for the Journal of Shoulder and Elbow Surgery and is a peer reviewer for multiple other orthopaedic publications. She has served as a Member at Large on the board of American Academy of Orthopedic Surgeons, and is currently a Delegate on the board of American Orthopedic Association.



Dr Chunyan Jiang
Professor
Beijing University, China

Dr Chunyan Jiang graduated from School of Medicine, Peking University in 1996. He took a shoulder fellowship with Prof Evan Flatow at Mt. Sinai Hospital, in New York in 2001. He is now an elite shoulder surgeon in china and takes care of all shoulder diseases, including trauma, osteoarthritis, rotator cuff disease and sports injury around shoulder. Dr Jian published more than 50 peer-reviewed articles and several textbooks about shoulder surgery. He is one of the founders of Chinese shoulder elbow society and is the foreign corresponding member of American Shoulder Elbow Surgeons (ASES).

INVITED FACULTY

Some key points from conference presentations are presented below:

DR ANGELA CADOGAN

Physiotherapy Specialist

Musculoskeletal

PH.D, NZRPS, MNZCP (Sports and Orthopaedic)

Shoulder Instability

The “Functional Shoulder”

Professor Greg Bain

Multidirectional instability is essentially a result of coracohumeral (CHL) ligament insufficiency.

Pathophysiology of MDI involves:

1. Enlarged, thin capsule
2. Muscle imbalance
3. Glenoid dysplasia

Conservative management is effective in 80-85% of cases

Treatment principles:

- Muscle imbalance = conservative management
- Enlarged capsule = capsular shift
- Glenoid dysplasia = glenoid osteotomy
- Scapula downward rotation = pec major transfer (if conservative management not an option)

Arthroscopic Soft Tissue Anterior Shoulder Stabilisation

Prof. Ejji Itoi

3 Main stability mechanisms of the shoulder:

1. Bony
2. Capsular
3. Muscle/conjoined tendon

Following arthroscopic Laterjet procedures:

- 70-80% of the mid-range, and end-range joint stability comes from subscapularis (and conjoined tendon)

Acromioclavicular Joint

AC Joint Dislocation and Surgical Management

Mr Alex Malone

AC joint dislocation occurs when the scapula (acromion) is driven forward under the clavicle (as in a fall on the posterolateral point of the shoulder).

The continuum of pathology appears to evolve thus:

- Lateral to medial stripping of the AC joint ligaments (and periosteum)
- Progressive injury to the trapezoid, then conoid ligament
- Associated periosteal injury and bleeding

Biomechanical effect:

- AC joint injury results in scapula dynamic instability in 3 planes
 - AP stability often overlooked

Provocative tests



- Cross-body adduction in which the arm is brought in a downwards direction during adduction, drives the scapula forward under the clavicle making clavicle displacement more obvious.
- Resisted external rotation often accentuates scapula ptosis (drooping) with increased displacement of the clavicle.

Radiology

- X-ray to Grade the injury (I-V)
- To exclude other pathology



Rotator Cuff Tears

Aetiology and Natural History of RC Tear

Associate Professor Leesa Galatz

Prevalence of tears by (average) age:

- 48 yrs No tear
- 58 yrs Unilateral tear
- 67 yrs Bilateral tear

Healing rate by age:

- Age 55 yrs Heal
New pain may signal ?? worsening tear
- Age 65 yrs Don't heal
Tears enlarge >66yrs

Natural history

- Anterior SSp involvement: these patients are more likely to develop fatty degeneration
- 49% increase in size by 5mm after 2-8 years
- FTT more likely to enlarge
- <60 years with larger tear (especially if anterior SSp involved) at risk for irreversible changes. Surgery required.
- >175mm² tear (symptomatic) likely to result in superior migration of humeral head.

Indications for Surgery:

- Patient 55 yrs with small tear
 - especially if anterior SSp involved
- Subscapularis tendon tears need to be repaired within 4-6 months (otherwise significant fatty infiltration/poor tissue repair potential).

Indications for conservative management

- Older patient
- Small tear
- Anterior SSp not involved

Predictors of Superior Migration HOH

- Infraspinatus involvement in tear
- >175mm² tear volume

>66 years of age: 50% prevalence of bilateral cuff tears

Rotator Cuff Repair: Does the Tendon Really Heal?

Assoc. Professor Leesa Galatz

Tendon healing is:

- Fibrotendinous healing – not normal tendon
 - Tendon is repaired, it doesn't regenerate
- Material strength only 1/10 of normal
- Structural strength ½ of normal

Delayed repair results in:

- Decreased muscle CSA
- Decreased bone strength
- Decreased tendon strength

Sensitivity (?? Of what ?USS)

- <27%
- Sensitivity increases with larger tears
- Specificity 80-90%
- MRI also misses them.

Sometimes "PTT bursal surface" is actually a FTT with only the capsular layer intact.

Non-Operative Treatment of RC Tear

Prof. Ejjj Itoi

True functional strength deficit of the torn cuff is approx.. 20%. The rest is pain inhibition. (Diagnostic block studies)

Pain management is an important aspect of treatment.

Predictors of change with non-operative management:

- AROM abduction
- Scapula dyskinesis
- Flexion strength

Conservative Management:

- Effective in 75% of patients
- 51% become symptomatic in 2-8 years
 - Higher proportion if involved in heavy manual labour
- If "new pain" in existing tear – conservative management no longer effective
- Should respond in 3 months. If not – refer for surgical opinion.

Responders:

(Tanaka et al. Ups J Med Sci 2010)

- -ve Impingement
- Good ER strength (concavity compression)

Supraspinatus function:

- 70% of force directed to anterior 1/3 SSP via intermuscular septum within tendon of SSP
- Risk for tear expansion = smoking.



Morphology of Humeral Insertion of Supraspinatus

Mr Khalid Mohammed

Supraspinatus and Infraspinatus footprints are distinct.

Supraspinatus:

- Triangular
- Medial AP length 20mm
- Lateral AP length 6mm
- Medial-lateral 6mm
- Extends across the IT groove to lesser tuberosity in 30% of cadavers

Infraspinatus:

- Trapezoidal
- Medial AP length 22mm
- Lateral AP length 25mm
- Medial-lateral 12mm
- Lateral border extends much further anteriorly upon highest facet of GT than in traditional descriptions.

Survey of Rotator Cuff Repair Protocols in New Zealand

Margie Olds (Ph.D Candidate, AUT University)

Bronwyn Harman and Margie Olds (Physiotherapists) from AUT conducted a survey of orthopaedic surgeons to investigate post-operative rotator cuff repair protocols among NZ surgeons with particular attention to length of immobilisation and exercise progression up to the 9-month post-operative time-point. There was considerable variation among the surgeons who responded to the survey particularly with respect to recommended activity level at various post-operative time-points. There was a general trend among the responding surgeons towards 4-6 week immobilisation periods with active movement and strength progressions beginning at the 3 month time-point post-operatively. Some protocols established phases of rehabilitation that varied according to tissue quality and size of repair.

Frozen Shoulder

Prof. Ejij Itoi

Recent 'consensus' definition of the "Stiff" Shoulder has been reached. "Stiff" Shoulder is defined as ROM:

- ≤ 100 deg flexion
- ≤ 10 deg ER
- \leq HBB to L5

Type I diabetics are almost 2x more likely to develop "stiff" shoulder, and when taking insulin for more than 10 years, another 2x more likely to develop "stiff" shoulder than those taking insulin for <5yrs.

Histology of frozen shoulder capsular tissue shows increase in:

- Type I collagen
- Proteoglycans
- Vasculature
- Fibrillation

Relationship between degree of stiffness and rotator cuff tear:

(Ueda et al, AAOS 2014)



- FTT
 - 0% (none) had 'severe' stiffness
 - 40-50% had mild/moderate stiffness
 - i.e – FTT unlikely to develop severely stiff shoulder

Conservative management:
(Griggs et al. JBJS-Am 2000)

Risk factors for failure;

- conservative treatment
- workers compensation

Post-operative Shoulder Stiffness

Mr Andrew Swann

Presented the characteristics of the post-operative 'frozen shoulder' (FS):

At 3 weeks post-operatively:

- higher than average pain scores
- rapid decrease ROM with firm block at 6 weeks

Type of surgery:

- Acromioplasty/RC repair 5%
- Labral repair 10%
- Stabilisation 4%

Histology in post-operative FS:

- Type III collagen (different to primary FS – Type I collagen)
- Presence of myofibroblasts

Trend towards increased probability of post-operative FS:

- Younger, small cuff tear
- Pre-operative stiffness
- Intra-articular surgery
- Intra- + extra-articular surgery (e.g labral repair and acromioplasty)

Prognosis:

- Medium term recovery without Rx
- No Rx – delays recovery but improves outcome
- General consensus among keynotes that CSI not advisable post-operatively.

Risk of re-tear:

- Most re-tears are not painful
- Patients with painful shoulders post-op – less likely to re-tear. ?why. May avoid harmful activities or 'tear healing' soreness.



Paediatric Shoulders

Paediatric Sports Injuries: Diagnosis, Treatment and Prevention of Repetitive Stress Injuries to the Shoulder in the Young Athlete.

Gabriel Brooks (Physiotherapist, Texas Children's Hospital, USA)

Challenges in this population:

- High volume activity
- Early sports specialisation
- Skeletal immaturity
- Poor motor control (CNS immaturity)
- Little/no rest/recovery
- Teaching 'technique' including kinetic chain involvement.

He highlighted that a 20% decrement in force transfer from the lower limbs in throwing, translates to a 40% decrement in force at the shoulder, meaning the shoulder must over-compensate when there are kinetic chain inefficiencies, resulting in an increased risk of injury.

Gabriel highlighted the importance of teaching correct 'technique' in sporting activities at younger ages to prevent later injuries, and to optimise performance. He also highlighted that at this most critical age when movement efficiency and correct mechanics are crucial, they are often surrounded by the least qualified coaches. A conundrum for consideration in talent identification and injury prevention programmes (the "top-down" funding approach for coaches).

Paediatric clavicle and Proximal Humeral Fractures: Do Some Really Need Surgery?

Ian Galley

In Children, the clavicle is at 80% of its adult length at age 10-12 years old.

- The long term sequelae of non-surgical management is unknown.
- In adults, 10-20mm of clavicle shortening can lead to scapula winging.

Clavicle fracture healing:

- Clavicle fractures in children unite rapidly, and usually with few complications.
- Adolescents have more problems with non-union as they approach skeletal maturity.

SC Joint injuries:

- Age <25 yrs: the epiphysis is unfused until the age of 25yrs, so any injury at younger age is considered a fracture (not a dislocation)

Special Populations

Shoulder Pain in Tetraplegia

Mr Khalid Mohammed

Prevalence of shoulder pain among tetraplegics is 40-80%, and appears to be more common in tetraplegics than paraplegics.

Acute spinal cord injury:

- High prevalence shoulder pain (85%) in first year after injury
- 60-70% prevalence after first year of injury
- Often develop "acute tetraplegic frozen shoulder":



- Incidence appears to be reduced in spinal cord treatment unit where preventative shoulder stretching/PROM is routinely performed in acute spinal cord injury.
- Likely neurogenic in aetiology

Clinical Features in Tetraplegic Shoulders:

- Shoulder adduction, extension and external rotation are the weakest movements (from Burwood Spinal Unit data)
- Absence of EMG only seen in lat dorsi, and only in high level lesions

Implications for Tetraplegic Patients:

- Functional limitations:
 - Transferring
 - Wheelchair use
 - Affects independence in at least 28% of patients

Examination:

- Ascertain type of wheelchair (motorised vs manual)
- Posture and chair set-up
- Thoracic and scapula posture, mobility, mechanics.
- Myofascial pain (trigger points)
- Assess ACJ for tenderness
- GHJ PROM and AROM
 - Assess PROM external rotation and determine cause of 'stiffness' (e.g pectoral spasm vs capsular)
 - Posterior capsule tightness /loss of internal rotation

Investigations:

- X-Ray and USS
- MRI for further investigation of cuff, labrum or cysts

Specific Diagnoses in Tetraplegic Patients:

- Acute tetraplegic frozen shoulder
- Spasticity-contractures (pec major)
- Inferior subluxation (high level lesions/hypotonia)
- Painful scapula winging

Common Diagnoses in Tetraplegic Patients

- Myofascial pain
- AC joint arthrosis
- Subacromial impingement
- Tendinopathy

Treatment:

- Patterns of use/wheelchair set-up/activity modification
- Rehabilitation (posture, ROM, strength – including adduction, posterior capsular stretching)
- Selective corticosteroid injections
- Surgery (deltoid preservation/arthroscopic techniques)
 - Acromioplasty
 - GHJ and ACJ debridement
 - Cuff repairs



Physiotherapy Session

In keeping with the NZSES philosophy of encouraging all members (both experienced and less experienced) to present in the interests of learning and collegial support, all physiotherapy attendees were encouraged to present. This was extremely worthwhile and resulted in some excellent and clinically relevant presentations as follows:

Classifications of Shoulder Instability and the Physiotherapy Management of Traumatic Instability in the Hypermobility Shoulder (Margie Olds, Auckland)

- Including rehabilitation progressions for unstable shoulders

Advanced Rehabilitation to Improve the Performance of the Netball Throw (Jo Kitchen)

- Key injury prevention and performance related issues were highlighted in relation to the shoulder and kinetic chain.

The Importance of Trapezius (Lisa Hansen, Hamilton)

- Case Study of spinal accessory nerve damage presenting with marked trapezius wasting

Diagnosis of Shoulder Pain: Back to the Future (Angela Cadogan, Christchurch)

- An historic look at the diagnostic classification of shoulder disorders and where we are today.

Evidence for Strength Training & Exercise Prescription in Young Athletes (Gabriel Brooks – Texas Childrens Hospital, USA)

- A description of the physiology of muscle performance in younger athletes and rehabilitation implications.

The Uses of Acupuncture for Shoulder Pain and Elbow Pain (Michelle Hall, Christchurch)

- An update on the evidence of how acupuncture works and its' application to shoulder and elbow pain.

