THE INTERNATIONAL SOCIETY FOR FRACTURE REPAIR NEWSLETTER

The International Society for Fracture Repair

Osteoporotic Fracture Campaign

October 2012

From the President,

The 13th Biennial Conference of the International Society for Fracture Repair is just around the corner. This year it will be held in Kyoto, Japan from November 6 to 9, 2012. The history and heritage lives on in the 1.5 million population modern city: with its seventeen UNESCO World Cultural Heritage Sites which is situated in a cityscape dominated by 2000 temples and shrines. The program promises to be exciting with lots of focus on fracture non-unions, fragility fracture, fracture healing, infection and complications, basic science and biomechanics. Presidential guest, Prof Thomas A. Russell, from Eads, Tennessee, will deliver a lecture on "Surgical approaches to bone healing in osteoporotic hip fracture patients: How has the implant adapted to the patient needs?". The invited guest lecturer is Prof. Clinton Rubin, from the department of biomedical engineering at Stony Brook University, will deliver a presentation on: "Fate selection and viability of mesenchymal and hematopoietic stem cell populations, disrupted by obesity, aging and disuse, are rescued by low intensity mechanical signals". "If you have never attended or presented at our conferences, you cannot imagine the international spirit and vitality of the sessions",

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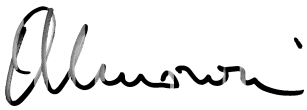
Says Prof. Takashi Matsushita (ISFR Meeting Chairman). For more information, please refer to our website www.fractures.com. Abstracts from the conference will also be found in the members login area once the conference has concluded.

We have highlighted our two young travel award winners in this issue: Dr. Eugenio Chiarello (Italy) and Dr. Anna Fahlgren (Sweden). You will also find three advanced clinical evidence (ACE) reports, which are critical summaries of the important details from selected publications. The report contains a synopsis of the publication, funding sources, the principal research question, important findings and their implications for the medical community. We invite you to register through www.myorthoevidence.com to receive up-to-date reports on topics of your choice.

Yours sincerely,



Antonio Moroni, ISFR President

The International Society for Fracture Repair

ISFR Pre-congress Symposium: Pathomechanism and Treatment of Nonunions

November 5-6, 2012 Kyoto, Japan

The process of fracture healing has become ever-better understood and the methods of fracture treatment ever-improved. However, non-union still remains a big problem in clinical practice. Although much research on chemical and mechanical stimulation for fracture healing has been reported, classic invasive auto bone graft is still widely used in clinical practice.

Monday, November 5

8:30 Opening ceremony

8:50 Session I Fracture Healing and Nonunion: Basic Science

Biology of fracture healing, Franz Jakob (Germany)

Influence of immune cells on bone healing, Georg Duda (Germany)

10:50 Session II When does Fracture go into non-union? Experimental Aspects

Mechanical conditions that lead to non-union, Lutz Claes (Germany)

Desirable mechanical conditions for fracture healing, Peter Augat (Germany)

13:50 Session III When does fracture go into non-union? Clinical aspects

Classification, evaluation, and diagnosis of non-union, David Hak (USA)

Nonunions due to wrong operation, Makoto Kobayashi (Japan)

Tuesday, November 6

8:30 Session IV Non operative treatment of non unions

Indirect intervention (smoking, nutrition, endocrine, metabolism, medication), Peter Giannoudis (UK)

Low-intensity pulsed ultrasound: Mechanism of action, Kouji Naruse, (Japan)

11:00 Session V Operative treatment of nonunions

Lower extremities nonunions—challenging cases, Volker Buhren (Austria)

Plating and nailing in nonunions– mechanobiology, Joerg Goldhahn (Switzerland)

Chipping technique and Iliazarov method, Takashi Matsushita (Japan)

14:30 Session VI Adjunct of nonunions

Cell-based therapy for nonunions, David Marsh (UK)

Acceleration of fracture healing by new protocol using mesenchymal stem cell, Yoshinobu Watanabe (Japan)

The role of mediators in bone nonunions, Georg Duda (Germany)

Non-operative treatment of non-unions, Peter Giannoudis

17:40 Closing Ceremony

Registration form for the pre-congress symposium can be found on www.isfrsymposium.com/registration.htm and can be returned by email to office@isfrsymposium.com or by Fax +81-75-213-7058.

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Travel Fellowship Award Winners

2012

ANNA FAHLGREN

I have been working with pathological changes in the musculoskeletal tissue the last fifteen years. My research area started with early bone and cartilage changes in post-traumatic arthrosis, to continue in tendon and ligament healing. The last five years my research is focused on prosthesis loosening. More specifically how mechanical factors such as pressurized fluid flow in the cortical bone can induce osteoclast differentiation and bone loss. Fluid flow and pressure itself reveal dramatic effects on implant survival. I have been using a multidisciplinary approach including cell and molecular bone biology, biomechanics and mathematical modeling. I just went back to Linkoping University in Sweden as lecturer after two years at hospital for Special Surgery (HSS) in New York. I have been collaborating with Dr. Mathias Bostrom at HSS where we combined our research and tried to answer "What key factors distinguish implants that loosen, from those that maintain adequate fixation?" I will further focus to understand what signaling pathways that distinguish mechanical induced osteolysis from inflammatory induced osteolysis.

EUGENIO CHIARELLO

As a medical student, involved in orthopaedic research, my primary focus has been in the field of osteoporosis. My thesis discussed comparative treatments of trochanteric fractures with either intramedullary nailing and hydroxyapatite-coated screws or without coating. During my residency, I have been co-investigator in various clinical trials involving osteoporotic drugs, surgical treatment of femoral neck fractures and surgical prevention of secondary osteoporotic fractures. My primary interest is bone healing and the use of bone substitutes as augmentation techniques for osteoporotic fractures. Once finished my residency training, I will be practicing in Bologna as orthopaedic surgeon and plan to complete a post graduate fellowship in orthopaedic research. The objective of my fellowship program is to increase my knowledge and skills in basic science and clinical research related to low energy fractures. I plan this fellowship in an environment where research and clinical care are closely linked so I can additionally gain clinical skills to benefit my future, professional work.

EVIDENCE BASED ORTHOPAEDIC MEDICINE
IN PARTNERSHIP WITH ORTHOEVIDENCE

The advanced clinical evidence (ACE) report is a critical summary of the important details from a selected publication that assess both quality and the potential for bias. The report contains a synopsis of the publication, funding sources and implications, the principle research question, study groups, methods, outcome measures, important findings and their implications for the medical community. More information can be found at www.myorthoevidence.com.

External Fixation Versus Internal Fixation for Unstable Distal Radius Fractures: A Systematic Review and Meta-Analysis of Comparative Clinical Trials

J Orthop Trauma. 2012 Jul;26(7):386-94
Level II Meta-analysis

9.5 Quality of Evidence Score for this ACE report.*

Synopsis

This meta-analysis identified a total 12 randomized and non-randomized trials (n=1011 patients) that compared external fixation with open reduction and internal fixation (ORIF) for the treatment of unstable distal radius fractures. Pooling of outcome measures suggested that ORIF provided significantly better Disability of the Arm, Shoulder and Hand (DASH) scores. In addition, ORIF was found to provide significantly superior forearm supination and restoration of anatomic volar tilt. On the other hand, it was found that external fixation had significantly better results in regards to grip strength and wrist flexion.

Why was this study needed now?

Currently, there is no clear consensus as to whether external fixation or ORIF provides better outcomes in patients with unstable distal radius fractures. Even though systematic reviews have been conducted on the topic, trials included were of poor quality, were non-comparative, and did not provide conclusive evidence. Since a recent systematic review in 2005, several randomized and comparative studies have been published on the topic which warrants a more recent, up-to-date systematic review.

What was the principal research question?

In patients with unstable distal radius fractures, does ORIF lead to better functional outcomes in comparison to external fixation?

What were the important findings?

- ORIF was significantly favored over external fixation in regards to DASH scores (SMD, 0.28; 95% CI, 0.03-0.53; P = 0.03; I2 = 49%).
- This effect was still significant when only randomized trials were compared (SMD, 0.25; 95% CI, 0.02?0.48; P = 0.04; I2 = 0%).
- plate fixation was found to provide significantly better supination (range of motion) (SMD, 0.22; 95% CI, 0.07-0.37; P = 0.003; I2 =
- external fixation was found provide better grip strength (SMD, -0.28; 95% CI, -0.57 to 0.00; P = 0.05; I2 = 68%). This effect became significant when studies using volar plates were compared (SMD, -0.33; 95% CI, -0.58 to -0.08; P = 0.01; I2 = 29%).
- ORIF was significantly favored over external fixation in regards to volar tilt (SMD, 0.43; 95% CI, 0.11-0.75; P = 0.008; I2 = 61%). Subgroup analysis could not resolve the high heterogeneity.

Unstable distal radius fracture: ORIF for better functional outcomes than external fixation. OrthoEvidence Advanced Clinical Evidence Report. In : Ortho Evidence. Created Sep 07, 2012, Last modified Oct 08, 2012. Retrieved Oct 10, 2012 from http://www.myorthoevidence.com-2012-?section=15&id=3484&list=3.

* Details about the Quality of Evidence Score for this ACE report can be found at www.myorthoevidence.com

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EVIDENCE BASED ORTHOPAEDIC MEDICINE
IN PARTNERSHIP WITH ORTHOEVIDENCE

Operative treatment of displaced mid-shaft fractures of the clavicle reduces complications

J Bone Joint Surg Am 2012; 18: 94 (8): 675-84
Level I Meta-analysis

10 Quality of Evidence Score for this ACE report.*

Synopsis

This meta-analysis identified 6 randomized clinical trials that compared operative and non-operative treatment of acute, displaced mid-shaft clavicle fractures. Results from this analysis indicate that there was a reduced complication rate in the operatively treated patients, with a decrease in non-unions and symptomatic malunions. A greater number of patients treated operatively were able to return to moderate activity 16 days following the injury, demonstrating that operative treatment provides superior early outcomes.

Sponsor

St. Michael's Hospital Orthopaedic Research and Education Fund (to R.C.M.)

Why was this study needed now?

The non-union rate of acute, displaced mid shaft fractures treated non-operatively has been reported to be as high as 15-20% and have detrimental affects on shoulder muscle strength. Based on these suboptimal outcomes for non-operative management, primary operative care has increased in popularity. This meta-analysis was conducted to evaluate treatment effects, potential harm and patient outcomes of these differing methods.

What was the principal research question?

Which treatment, operative or nonoperative, provides the best clinical and functional results and what are the complications associated with these procedures for patients presenting with displaced mid-shaft fracture of the clavicle?

What were the important findings?

- Non-union rate was significantly higher in the non-operative patients (29/200) than the patients treated operatively (3/212) (p=0.001)
- The rate of patients with a symptomatic malunion was signficantly greater in the non-operative group (17/200) compared to the operative group (0/200) (p<0.001)
- The overall complication rate was significantly greater in the non-operative group (84/200) compared to the operative group (62/212) (p=0.0075)
- Three studies reported Constant Shoulder scores at one year weighted operative average was 94.3 compared to the non-operative average of 90.2
- DASH scores appeared to favour the operative group but these were only reported numerically in 2 studies and graphically in one
- Early return to moderate activity on the 16th day was possible in 80% of the operatively treated patiend compared to 55% in the non-operative patients

Operative treatment of displaced mid-shaft fractures of the clavicle reduces complications. OrthoEvidence Advanced Clinical Evidence Report. In: Ortho Evidence. Created Oct 01, 2011. Last modified Jul 03, 2012. Retrieved Oct 10, 2012 from http://www.myorthoevidence.com/2012/?sectino=15&id=2968&list=8

* Details about the Quality of Evidence Score for this ACE report can be found at www.myorthoevidence.com

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EVIDENCE BASED ORTHOPAEDIC MEDICINE
IN PARTNERSHIP WITH ORTHOEVIDENCE

Zoledronic acid in the prevention and treatment of glucocorticoid-induced osteoporosis

Lancet 2009 11; 373 (9671): 1253-63.
Therapy Level 1—Randomized Trial

9 Quality of Evidence Score for this ACE report.*

Synopsis

833 patients undergoing treatment with glucocorticoids for 12 months were randomized to receive zoledronic acid or risedronate in this double blind, double dummy trial. This study assessed the non-inferiority of zoledronic acid for the treatment of glucocorticoid induced osteoporosis. Following the one year treatment period patients receiving treatment with zoledronic acid demonstrated a significant increase in bone mineral density.

Sponsor

Industry Funded: Novartis pharma.

Why was this study needed now?

Glucocorticoid drugs are a common treatment for a number of disorders; however their use is associated with side-affects, such as bone loss and increased fracture risk. Bisphosphonates are often given to counteract this effect by inhibiting bone resorption but there is a lack of compliance to daily oral administration. Treatment with zoledronic acid, a potent bisphosphonate which is given yearly, is an alternative option which has yet to be assessed in a randomized trial.

What was the principal research question?

Is treatment with zoledronic acid non-inferior to daily risedronate administration in patients taking glucocorticoids for the prevention or treatment of glucocorticoid induced osteoporosis?

What were the important findings?

- At 12 months zoledronic acid treatment had produced a greater increase in lumbar spine bone mineral density when compared to risedronate in both the treatment (least-squares mean 4.06% [SE 0.28] vs 2.71% [SE 0.28] and prevention subgroups (2.60% [SE 0.45] vs 0.64% [SE 0.46]
- Increases in bone mineral density at 6 months were significantly higher in the zoledronic acid group than in the risedronate group for the lumbar spine, total hip and trochanter
- Reductions in biomarkers of bone resorption at 12 months were significantly greater in patients on zoledronic acid
- EQ-5D health-related quality-of-life data showed no significant differences between drug groups for either the visual analogue or utility score at 6 months or 12 months

Zoledronic acid in the prevention and treatment of glucosteroid-induced osteoporosis. OrthoEvidence Advanced Clinical Evidence Report In: Ortho Evidence. Created Oct 01, 2011. Last modified May 27, 2012. Retrieved Oct 10, 2012 from http://www.myorthoevidence.com/2012/?section=15&id=318

* Details about the Quality of Evidence Score for this ACE report can be found at www.myorthoevidence.com

Meetings & ISFR Member Publications

North American Spine Society

October 24-27, 2012

Dallas, Texas

Www.nassannualmeeting.org

Pathomechanism and Treatment of Nonunions

Pre-congress symposium

November 5-6, 2012

Kyoto, Japan

www.isfr2012.com

ISFR 13th Biennial Conference

November 6-9, 2012

Kyoto, Japan

Www.isfr2012.com

Orthopaedic Research Society

January 26-29, 2013

San Antonio, Texas

Www.ors.org

American Academy of Orthopaedic Surgeons

March 19-23, 2013

Chicago, Illinois

Www.aaos.org

European Calcified Tissue Society

May 18-21, 2013

Lisbon, Portugal

Www.ectscongress.org/2013

A bisphosphonate-coating improves the fixation of metal implants in human bone. A randomized trial of dental implants. Abtani J, Tengwall P, Aspenberg P. Bone 2012 50 (5): 1148-51.

Prognostic factors for predicting outcomes after intramedullary nailing of the tibia. Schemitsch EH, Bhandari M, Guyatt G et al. J Bone Joint Surg Am 2012 3; 94 (19): 1786-93

Variability in the definition and perceived causes of delayed unions and nonunions: a cross-sectional, multinational survey of orthopaedic surgeons. Bhandari M, Fong K, Sprague S et al. J Bone Joint Surg 2012; 1; 94 (15): e1091-6

The Hip Fracture Surgery in Elderly Patients (HIPELD) study: protocol for a randomized, multicentre controlled trial evaluating the effect of xenon on postoperative delirium in older patients undergoing hip fracture surgery. Coburn M, Sanders RD, Maze M et al. Trials 2012; 27; 13(1):180.

Sauve-Kapandji as a salvage procedure to treat a nonunion of the distal radius. Karuppiah SV, Johnstone AJ. J Trauma 2010; 68(5): E123-5.

Biomechanical comparison of inramedullar versus extramedullar stabilization of intra-articular tibial plateau fractures. Hogel F, Hoffman S, Panzer S et al. Arch Orthop Trauma Surg 2012, 18.

Use of BMPs and bisphosphonates in improving bone fracture healing. Yu NY, Schnindeler A, Tagil M et al. Front Biosci (Elite Ed) 2012 1:14: 2647-53.

The initiative on hip fractures of the Veneto Region. Rossini M, Caimmi C, Giannini S et al. Clin Cases Miner Bone Metab 2012; 9 (1):45-9.

Patient perceptions of the path to osteoporosis care following a fragility fracture. Beaton DE, Sujic R, McIlroy BK et al. Qual Health Res 2012 Aug 24.

Macroscopic and microscopic analysis of the the thumb carpometacarpal ligaments: a cadaveric study of ligament anatomy and histology. Ladd AL, Lee J, Hagert E. J Bone Joint Surg Am 2012 15; 94 (16): 1468-77.

Endothelial progenitor cells: a novel cell-based therapy in orthopaedic surgery. Atesok K, Li R, Schemitsch E. J Am Acad Orthop Surg 2012; 20 (10); 672-4.

ISFR Newsletter October 2012 Issue

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