Annual Report 2017

Academic Activities
Department of Orthopaedic Surgery

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ORTOPAEDIC RESEARCH GROUP

Research Fellows:

Asbjørn Årøen (Professor)
Stein Erik Utvåg (Associate Professor)
Truls M. Straume-Næsheim (Postdoc)
Per-Henrik Randsborg (Postdoc)
Jan Harald Røtterud (PhD)
Aron Adelved (PhD)
Rune BruhnJakobsen (PhD)
Oliver Grundnes (PhD)
Inge Skråmm (PhD)
Christian Owesen (PhD)
Cathrine NøstadEngen (PhD)
Ola-Lars Hammer (PhD student)
Svend Ulstein (PhD student)
Anders Wensaaas (Dr. Philos student)
Ingi Thor Hauksson (PhD student)
Stefan Bartels (PhD student)
Hendrik Fuglesang (PhD student)
Filip C. Dolatowski (PhD student)
Ståle Myhrvold (PhD student)
Ståle Clementsen (PhD student)
Christian Pollmann (PhD student)
Annette Wikreøy (PhD student)
Espen Femmo Brouwer
Stian Kjennvold
Morten Havdal
Erik Engbretsen
Max Temmesfeld
Monica Sailer
Sjur Oppebøen
Sverre Mjønes
Heidi A. Hanvold
Eline Elshaug Schjønneberg
Torunn Hammer
Tine Kårstrud Pettersen
Sofie Høen
Therese Vårheim Gundersen
Trine Fjeld Myhrvold

Head: Professor Asbjørn Årøen

Research positions and PhD students

University employees:
Professor II Asbjørn Årøen
Associate Professor Stein Erik Utvåg

D-positions:
Svend Ulstein – ligament and cartilage injuries
Christian Owesen – cruciate ligament injuries

University candidate with a teaching duty of 100%
Hendrik Fuglesang – clavicular fractures

University candidate with a teaching duty of 50%
Ola-Lars Hammer – distal radius fractures
THE RESEARCH YEAR 2017 IN REVIEW

Our research group has this year made further steps towards the aim to be a recognized orthopedic academic center in Scandinavia. Most importantly, we continue to expand our field of research with a steady numbers of publications in international well-recognized orthopedic journals.

Important is also that we continue to take the lead in several of the projects we are engaged in.

The completion of the PhD-defense by Dr Christian Owesen in September 2017 was surely one of the main highlights of this year. The defense received good attendance from our own hospital as well as neighboring institutions. The committee consisting of Professor Anne Eskild (UIO), Professor Ove Furnes (UIB) and associated professor Anders Staalmann (Karolinska institute, Sweden) did a fantastic work in order to discuss dr Owesens PhD Work. We have realistic hopes that the number of PhD-defenses will double in 2018. Dr. Owesens research position was financed by The Orthopedic Department and we are very happy that this position will be upheld in view of the difficult challenges related to the budget. The position has been filled by Dr Christian Pollmann whose work focus on fractures of the hip. This is a large patient group, which will help us reach the target set by Helse Sør-Øst of 5% of patients to be included in clinical trials. We have successfully applied for the startup of three new PhD students in our group this year, and they are all on their way with their courses and studies as planned. Furthermore, the importance that PhD students must include the University of Oslo as affiliation in publications that are included in their PhD-degree must be underlined once again. As much of our research is clinical trials, journals will frequently ask for the reference number in www.clinicaltrials. Do not forget to register your excellent study at www.clinicaltrials.gov to enable you to publish in the highest ranked journals.

Our symposium on back pain, diagnostics and treatment was the best-attended symposium ever, underlining that this symposium will continue to be an important promotion of our research. This symposium earns credits by the Association of Norwegian Physicians in Norway. All though our projects often include other work groups, such as nurses and physiotherapists, we have not been able to motivate these groups to be principal investigators in their own projects. Our ambition is to see master students in nursing and physiotherapy as part of our research group.

This year was disappointing regarding research grants. The only one approved this year was Dr Monica Sailer awarded with orthopedic research grant for her proposal on infected ACL grafts. Congratulations also to Dr Max Temmesfeld for his award for best presentation at the annual meeting in orthopedic surgery. We are still waiting for the final evaluation of our applications for this year. The number of application from our group is increasing every year, which are of major importance in order to reach our ambitions.

Publication rate needs to increase, but in perspective to all our ongoing projects, the prediction of this is realistically positive.

Best wishes for success in research in 2018.

Professor Asbjørn Årøen

ORTOPAEDIC RESEARCH COMMITTEE 2017

Ortopaedic Research Committee.
Left to right: Wenche Bjerkestrand Jacobsen, Asbjørn Årøen, Truls Martin Straume-Næsheim, Rune Bruhn Jacobsen, Stefan Bartels, Per-Henrik Randsborg. Not present on the day of photography: Stein-Erik Utvåg
Foto: Nina Mickelson Weldingh

The principal tasks of the committee are to:

- Promote research and research training for all workers in the Orthopaedic Clinic
- Develop research activities, research quality, and publication frequency within the Orthopaedic Research Group
- Improve the communication of orthopaedic research and published results from the group
- Ensure that research is maintained as a high priority within the division
Summary of Research Activity

Peer reviewed publications and dissertations of members of the Department of Orthopaedic Surgery in the last eight years.

Peer reviewed publications and dissertations 2010-2017

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<th>Year</th>
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ORTHOPAEDIC SYMPOSIUM

Back pain, diagnostics and treatment
The Department of Orthopaedic Surgery Research day
Akershus University Hospital, October 20th, 2017

This year’s orthopaedic seminar is the clinic’s 4th annual external seminar since 2014. We are proud to maintain good academic and scientific quality at these seminars.

The numbers of participants at our symposiums are increasing, with a total of 135 participants this year. This is an increase of nearly 15% from last year. 117 out of 135 (87%) participants were not from Akershus University Hospital, which may indicate that our seminars are recognized by external practitioners. We are pleased with this, but we also want to welcome more internal participants next year.

The theme for this year’s seminar was Back pain, diagnostics and treatment, chaired by Asbjørn Årøen. Professor Jens Ivar Brox was invited to talk about chronic back pain, with focus on effective interventions. Furthermore, specialist Even Lærum gave an informative lecture on the “good communication”, who gave us all something to have in mind when we communicate with patients with back pain. We were also lucky to have neurologist and professor Christoffer Lundqvist to talk about assessment of back pain in the specialist health service, while radiologist Hassan Banitalebi gave us an insight of the assessment from a radiological perspective.

Interdisciplinary cooperation is important for the orthopaedic research group and we were fortunate to get special physiotherapist Vegar Hjermundrud and chiropractor Joakim Hertel to convey useful information on how to make a good referral to the physiotherapist and on the assessment chiropractor performs on this patient group. The investigation and treatment of Modic changes is challenging, something MD fellow Lars Christian Bråten did a very professional lecture on. Anaesthesiologist Raulf Neugeberg showed us the challenges of relieving the pain of back patients. Finally spinal surgeon Oliver Grundnes ended the day with his lecture on topical surgery for chronic back pain.

The symposium was approved as a course in the Norwegian Medical Association (NMA). The feedback on the symposium was good, confirming professional lectures and an appreciated topic.
**PRIZES AND AWARDS**

**Orthopaedic research group**

**Best Paper Award 2016:**


**Best lectures at The Norwegian Orthopaedic Society’s Autumn Meeting:**


**Research Stipend**


**DISSERTATIONS**

**Cathrine Nørstad Engen**

Knee cartilage surgery: epidemiology, research methods and a proposal for improved surveillance.

Main supervisor: Professor Lars Engebretsen, Orthopaedic Clinic, Department of Clinical Medicine, Faculty of Medicine, University of Oslo. Dissertation June 12th 2017, Akershus university hospital.

This dissertation proposes that a quality register should be established to study all patients who are being treated with dental surgery and to ensure that follow-up is standardized. We have conducted a pilot study on such a register and find that there are some challenges that need to be clarified before a final national register can be formed, but that such a register is possible. We believe that this will improve the quality of treatment and in the long term, make it easier to find the right treatment for those affected.

The entire range from low-activity individuals to top-aged athletes can cause a localized cartilage injury in the knee. This type of injury occurs for many ages, but is the most common in a relatively young adult patient group. Symptoms are pain and stiffness, and many experience reduced knee function and, at worst, early impaired work ability. Researchers in the field believe that most localized cartilage injuries also increase the risk of developing osteoarthritis, which may end in a knee prosthesis. These injuries vary in size and depth and are located in different areas of the knee joint. All of this causes variation in symptoms and also requires different approaches to treatment.

As both the range of people with localized cartilage damage and the injuries in themselves vary so much, it can be challenging to find the right treatment for everybody who is affected.

The treatment options range from crush relief, through training at a specialized physiotherapist, and simpler breast surgery to advanced surgery with transplantation of cartilage cells.

From our studies, we see that there are a large group of patients who are treated with breast surgery annually in Norway. The research results are today scary and are aimed primarily at a smaller subgroup of the population of patients with focal cartilage damage in the knee. At the same time, follow-up is little standardized and we lack biomarkers to capture patients with increased risk of early osteoarthritis.
Christian Owesen
Symptoms, Diagnosis and Outcomes in PCL Injuries
Main supervisor: Professor Asbjørn Årøen, Orthopaedic Clinic, Akershus University Hospital, Department of Clinical Medicine, Faculty of Medicine, University of Oslo
Dissertation: September 21st, 2017, Akershus University Hospital

Back injury (PCL) damage is a serious knee injury. The injury is relatively rarely compared to injury to the forearm (ACL). Some patients have major ailments after rehabilitation and exercise after a PCL injury and need surgical treatment. All cross conveyor operations performed in Norway are reported to the Crossbatch Register (NKLR).

In his dissertation, Christian Owesen and colleagues have studied the epidemiology and the course of operating PCL injuries. The studies used registry data from NKLR and data from corresponding registers in Sweden and Denmark. At the most, 1287 patients are included. This is the largest number of such injuries included in a published study.

Studies show that sports are the most common cause of PCL injuries. There are similar injury mechanisms and accompanying injuries in the Scandinavian countries. In just 1/3 of the PCL lesions there is no damage to other ligaments in the knee. Patients with PCL injury report poorer knee function than those with ACL injury both before and after surgery. There is also a significantly longer time from injury to surgery for those with PCL damage. Patients injured in sports report better knee function after surgery than those with other injury mechanisms. It does not appear as if accompanying damage to other ligaments provides worse reported knee function after surgery than damage to PCL alone. A cost analysis shows that PCL reconstruction is considered a cost-effective treatment.

ONGOING RESEARCH PROJECTS

Fractures in children
Fractures in children: Distal radius fractures in patients younger than 16: Are they classified and treated according to internal guidelines? A quality control project.

Rune B Jakobsen MD PhD, Tor Kristian Molstad Andresen MD, Øystein Sandnes MD, Per-Henrik Randsborg MD PhD.

Introduction: Fractures of the distal radius are common in children. More than 500 such fractures are treated at Akershus University Hospital each year. This amounts to a significant part of the total volume of patients treated at the emergency ward. Previously Randsborg and Svartsen have studied the epidemiology of these fractures and found that buckle-type fractures may be treated conservatively with a forearm cast, which the patient or parents remove without any follow-up appointments, as opposed to the other types of distal radius fractures that are generally treated conservatively, but with follow-up at one and four to six weeks due to the risk of displacement and malunion. These findings were incorporated in the hospital’s internal guidelines and included in the manual for the emergency ward which was made available in the department March 2013. It is not known to what extent these changes are reflected in the actual treatment delivered.

Aim: Internal quality control of the conservative and operative treatment of distal radius fractures in children under the age of 16.

1. Are fractures classified correctly (buckle, greenstick, complete, physeal [Salter-Harris])?
2. Are they treated according to internal guidelines, with specific focus on buckle and greenstick fractures and the number of scheduled controls?
3. Are there any complications during the first year after the initial trauma?

Materials and methods: Patients aged 0-15 have been identified from their ICD-10 codes (S52.5) for the full year between September 2014 and 2015. Patients not residing in the area served by AHUS were excluded. Patient characteristics, treatment and complications are identified from the electronic medical record by one of the researchers, and x-rays are classified independently by two of the involved researchers. Statistics will be mainly descriptive. Inter-rater agreement will be assessed by standard kappa-statistics.

Current status: Data acquisitions been on hold but hopefully will be completed spring 2018.

Publications: Results from the study will be published in an international peer-reviewed journal of orthopaedic surgery.

Funding: No funding at the moment.
Upper extremity

Operative evaluation of fractures of the middle third of the clavicle.

Hendrik Frølich Stange Fuglesang MD PhD student, Gunnar B Flugsrud MD PhD (Oslo University Hospital) and Stein Erik Utvåg MD PhD Associate professor (Akershus University Hospital and University of Oslo)

Introduction: Clavicle fractures are one of the most common fractures, accounting for about 4% of all fractures and about 35% of all fractures in the shoulder region. Midshaft fractures account for approximately 80% of the clavicle fractures. Traditionally, midshaft fractures have been thought to have a good prognosis even when substantially displaced, and most have been treated nonoperatively with a sling or a figure-eight bandage. Early studies by Neer and Rowe in the 1960s demonstrated a very low nonunion rate, with a prevalence of 4 in a series of 566 patients, and 3 nonunions of 2,235 in another. On this basis, the general view has been that the vast majority of even severely displaced midshaft fractures healed uneventfully, with a very low nonunion rate and a good functional result. Operative treatment reported, on the other hand, bad results, especially concerning the risk of infection. Recent studies, however, draw different conclusions and suggest conservative treatment of displaced fractures might not be as favorable as once thought. In a series of 52 completely displaced midclavicular fractures, Hill showed there was a nonunion rate of 15% (8 of 52 patients) and 31% rate (16 of 52) of dissatisfaction by patients with the end result. This correlated with a shortening of more than 2 cm. In a prospective study of 222 patients by Nowak, 42% (93 of 222) were found to have persisting symptoms after six months, whereas 15% were found to have nonunion. These symptoms seem to persist even after nine to ten years, at which point 29% of 208 patients reported pain during activity and 9% pain at rest. Forty-six percent did not consider themselves fully recovered. It is becoming more evident that conservative treatment gives significantly inferior results compared to earlier reported results.

Operative treatment of displaced midclavicular fractures, on the other hand, shows reliably good results compared to earlier reported results. In 2007, the Canadian Orthopaedic Trauma Society published a prospective randomized controlled trial of 132 patients, randomized to either conservative treatment with a sling or plate fixation. The operative group showed clear superiority in Constant and DASH Scores, reduction in risk of developing nonunion and earlier return to work. With intramedullary nailing using ESIN technique, Smekal et al. demonstrated superior results in the operative group in a prospective randomized controlled trial of 60 patients. Thirty patients were operated on with elastic stable intramedullary nailing, and another 30 patients were randomized to conservative treatment with a sling. The operative group had fewer complications, shorter time to union and a better functional outcome.

It seems from the above, that it is reasonable to offer operative treatment to active adults with displaced fractures of the middle third of the clavicle due to the risk of developing a symptomatic non- or malunion. Both plate fixation and intramedullary nailing of displaced fractures are described as safe methods of operative treatment.

Aim: We aim to conduct a retrospective cohort study of conservatively treated clavicle fractures in the period 2005–2008 in AHUS’ catchment area (Study 1). Further, we will conduct a prospective randomized controlled study to compare intramedullary nailing and plate fixation (Study 2) and try to identify a treatment algorithm. A five-year follow-up of Study 2 will be paper 3.

Materials and methods:
Study 1. Retrospective cohort study of 59 patients. Interview, patient-oriented scores (DASH and Constant Score) and radiographic evaluation.
Study 2. Prospective RCT of 123 patients. Randomized to plate or elastic intramedullary nailing. Follow-up at 6, 12, 26, 52 weeks. Radiographic and functional (DASH and Constant Score) evaluation. SF-36.
Study 3. Prospective RCT of 123 patients, five-year follow-up.

Current status:
Study 1. Published.
Study 2. Published
Study 3. Submitted

Planned dissertation: spring or early autumn 2018
Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial.

Annette K.B. Wikerøy MD PhD student, Per Henrik Randsborg MD PhD, Hendrik S.F. Fuglesang PhD student, Sjur Oppebøen MD, Rune Brun Jakobsen PhD

Introduction: The population is ageing and the incidence of proximal humerus fractures (PHF) is increasing. New angle-stable implants give better stability for complex osteoporotic fractures, thus more fractures are treated surgically. The most common complications are related to the osteosynthesis-material: varus failure (4-14%) or penetration of screws through the cartilage in the shoulder joint. The commonest implant used in Norway is the locking stable plate, but many other countries use locking stable nails. The two methods seem to have comparable functional results; there may be a slight higher complication rate in the plates. Both implants require adequate reduction; they provide fixation options for stabilizing the tuberosities and the calcar. The nails may add additional stability hindering varus failure when introduced flush or just below the cartilage surface. The locking plate may stabilize the tuberosities more rigid and it provides more angle stable screws in the humeral head to hinder osteosynthesis failure. We wish to conduct a prospective randomized controlled trial to compare nail versus plate fixation in 3 and 4 part PHFs. These two well-established methods have not been compared in a level one manner.

Aim: The project’s aim is to compare the operative treatment of 3 and 4 part fractures of the shoulder with angle stable plates or nails in light of clinical and radiological results during 2 years. The project is part of Dr. Wikerøy’s PhD program.

Primary aim: Functional outcome of surgical treatment as evaluated by the DASH score at follow-up.

Secondary aims: Registration of radiological complications defined by a reduction of Head-Shaft-Angle (HSA) of ≥10° in frontal plane or screw penetration cut-out, screw failure or failure of the osteosynthesis on radiographs within two years. Initial radiographic examination performed with standardized radiograph projections; true antero-posterior projection and scapula projection pre- and post-operative. Computer-tomographic scans (CT) before and after surgery will help clarify classification, fracture configuration and results. The HSA varies between 120-140° in the normal population, so we will take front radiographs of opposite proximal humerus of all included patients to act as their own control. Functional outcome of surgical treatment as evaluated by the Constant score by independent and blinded physiotherapists during follow-up. Measurement of strength performed according to recommendations given by the European Society of Shoulder and Elbow Surgeons ESSSE (http://secec.org/). EQ-5D, a generic measure of health statuses that provide a simple descriptive profile used in clinical evaluation of health care.

Health economic registration; length of hospital stay, sick leaves, use of physiotherapy, appointments at general practitioners, extra controls at in-patient orthopedic clinic, removal of plate or nail, extra surgeries. Implant costs, theatre time.

Monitoring complications such as deep or superficial infection, avascular necrosis, nerve or vessel-damage and DVTs. We will also invite patients to attend a 5 year and 10 year follow up appointment. During these late controls, all the primary and secondary outcomes as described above.

Materials and methods: This is a single-center randomized controlled trial (RCT). Patients admitted to AHUS from 01.10.16 to 01.10.19 with a displaced 3 or 4 part proximal humeral fracture of OTA/ AO group 11B2 or 11C2 in need of surgical treatment will be randomly allocated to two groups; intramedullary nailing or angular stable plate fixation.

Inclusion criteria:
- Patients > 18 years

Exclusion criteria:
- Fracture more than 3 weeks’ old
- Caput humeri just a thin shell or split
- Ipsilateral damage that will influence the recovery and scoring systems
- Incapability to protect osteosynthesis, i.e. use of crutches because of injury to lower extremity.
- Pathological fracture
- Neurovascular injury
- Open fracture
- Noncompliance
- Congenital anomaly
- Ongoing infectious process around the incision site for plate osteosynthesis
- Systemic disease that may influence healing processes or scoring systems (RA/MS)
- Fracture dislocation
- Substance abuse
- Inability to read and understand Norwegian
- Patients not residing in our catchment area
- Patients with too small humerus diameter to use a nail

Statistical power: A change in subscore of 10 of the DASH score is considered clinically significant (Hunsaker). Therefore, for power analysis a difference in change of 10 between two treatment groups is assumed. A standard deviation of the DASH score is assumed to be 15 for each method as suggested by Hunsaker (24). With a significance level of 5% and power of 80%, usual power calculations suggest a sample of 36 patients treated by each method of operation, that is, a total sample of 72. We aim to include 90 patients to include a risk of losing 20% of patients to follow-up. We treated 142 patients surgically for 3 and 4 part PHF during 4 years (2011-2014). We estimate inclusion time to be approximately 2.5-3 years.

Status: Started including patients in RCT 5th October 2016, we have included 25 patients. Addition of postoperative CT scan of included patients accepted by REK. A Phantom for measuring bone density in these CT examinations has been added; this is in cooperation with dr. Hasan Banitalebi (radiology department).

Funding:
- 2017 Strategiske midler Ahus kr 150 000
- 2018 Strategiske midler Ahus kr 0
- 2016 Norsk ortopedisk forenings forskningsutstsend kr 50 000
- 2016 Smith and Nephew's forskningsstipend kr 25 000
- 2017 Forskningsmidler, Sofies Minde AS kr 389 000
- 2017 Open Access forskningskomiteen orto avd kr 20 000

All together: 634 000
**“Radius C-study” - Volar locked plating versus bridging external fixation.**

Ola-Lars Hammer MD PhD student, Jan Erik Madsen MD Professor (Oslo University Hospital), Ståle Clementsen MD PhD student, Per Henrik Randsborg MD PhD.

**Introduction:** Earlier, the standard method of fixation of the most comminute distal radius fractures was an external fixation supplemented by K-wires. Since the development of the volar locking plate technology, a new approach to the treatment of these fractures has gained popularity worldwide. Over the past couple of years, the volar locking plate has achieved dominance in the treatment of most fractures of the distal radius. This has occurred without the backing of large prospective, randomized studies. There is to date little solid scientific data to support this drastic change in treatment rationale. External fixation and volar locking plates differ widely in operative technique, duration of immobilization postoperatively and potential complications. The newer implants are also significantly more expensive than the established option of external fixation.

**Aim:**

1. We hope to disclose the various benefits and possible drawbacks of volar locked plating versus augmented external fixation and hopefully make a recommendation for a treatment rationale.
2. A secondary aim of our study is to thoroughly examine the cost of volar locked plating versus augmented external fixation.

**Materials and methods:** We have designed a randomized, prospective study for comparison of volar locked plating versus Hoffman II bridging external fixation supplemented by K-wire fixation in patients with comminute distal radius fractures, AO/OTA type C2 and C3. On the basis of power analysis, a total of 166 patients are to be included in this project. The follow-up period is two years and evaluation is based on x-ray analysis, grip strength, range of movement, pain and various tools to measure quality of life and satisfaction with the treatment (EQ-5d, SF-36, Quick DASH).

**Current status:** By February 2015, two-year follow-up of all patients was concluded. The authors spent 2016 finishing the database, entering a substantial amount of data and performing the statistical analysis. During 2017 the first publication was finished and submitted, the two remaining publications were drafted.

**Publications:** The first publication was submitted to JBJS in January 2018. The second and third articles will be ready for submission during the first half of 2018.

These are:

1. **Volar Locking Plates Versus Augmented External Fixation in Intra-Articular Distal Radius Fractures - A Randomized, Controlled Study**
   - Functional outcome
2. **The cost of volar locking plate compared to that of augmented external fixation for comminute distal radial fractures**
3. **Volar Locking Plates Versus Augmented External Fixation in Intra-Articular Distal Radius Fractures - Radiological outcome**

**Funding:**

- Ahus Internal Strategic Research Funding 2015 100 000 NOK
- Ahus Internal Strategic Research Funding 2011 100 000 NOK

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**“The senior study” - Long-term outcome after distal radius fractures in elderly patients**

Ståle Clementsen MD PhD student, Per Henrik Randsborg MD PhD, Ola Lars Hammer MD PhD student.

**Introduction:** The intention is to study the outcome after a distal radius fracture amongst the oldest patients. We intend to examine patients, above the age of 70, who in 2012 sustained a distal radius fracture and were treated at our facility. This includes both well-functioning and low-demand elderly patients. We will investigate the type of treatment given and measure outcomes such as mobility, grip strength, pain, Quick-DASH-score and x-ray findings. We will also, using instruments such as the VES-13 score investigate their general level of functioning and view this in the perspective of the other outcome measures.

**Current status:** Data collection is almost complete, and will be finished by the end of spring 2018, data sorting and analysis during summer 2018.

**Publications:** Submission is expected by the end of 2018

**Funding:**

- Sophie Minde Ortopedi AS Grant 2014 345 000 NOK

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**“The Mobilization Study” - The value of early mobilization and physiotherapy following wrist fractures treated by volar plating.**

Ståle Clementsen MD PhD student, Per Henrik Randsborg MD PhD, Ola Lars Hammer MD PhD student.

**Introduction:** At Akershus University Hospital the standard regimen following surgery with volar locking plates for wrist fractures is immobilization in a cast for 2 days and then non-weight-bearing home exercises for the next 6 weeks. At other hospitals, a longer course of post-operative immobilization is standard practice, most often a cast for 2-3 weeks. The use of physiotherapy in the post-operative phase also varies, and the use of physiotherapy at our hospital is most often left to the individual surgeon, whereas it at other facilities is part of the standard follow-up regimen.

There is no solid scientific data supporting a preference for neither late nor early mobilization following a distal radius fracture. Although the idea of early movement seems appealing and wanted, the benefits of this have yet to be proven by objective measures. On the other side, no harmful effect has been demonstrated by non-weight-bearing exercises. The use of physiotherapy is widespread, but again the benefits are not measurable in the long term.

**Aim:**

1. We hope to disclose the various benefits and possible drawbacks of early mobilization, weight-bearing exercises and physiotherapy versus late mobilization and home exercises alone and hopefully make a recommendation for a postoperative treatment rationale.
2. A secondary aim for our study is to examine the cost-benefit of the two possible postoperative regimens.

**Materials and methods:** We have designed a randomized, prospective study for comparison of early mobilization and physiotherapy versus late mobilization and home exercises following surgery with a volar locking plate for AO/OTA type A extra-articular fractures. On the basis of power analysis, a total of 124 patients are to be included in this project. The follow-up period is two years and evaluation is based on x-ray analysis, grip strength, range of movement, pain and various tools to measure quality of life and patient satisfaction with the treatment (EQ-5d, Quick DASH).

**Current status:** Complete follow-up of all patients was concluded in April 2016. These are now being entered into the database.

**Publications:** The first submission is expected by the first half 2018.

**Funding:** None.
Current management of radius fractures viewed in perspective of patient complaints forwarded to The Norwegian System of Patient Injury Compensation.

Per Henrik Randsborg MD PhD, Erik Engebretsen MD, Ola-Lars Hammer MD PhD student.

Introduction: A review of all patient complaint claims forwarded to The Norwegian System of Patient Injury Compensation (NPE) from 2000 through 2013 after treatment for distal radius fractures (ICD-10 S52.5).

Aim: Identify the most common causes for compensation granted due to patients’ complaints following treatment of distal radial fractures in Norway. Both surgically- and nonsurgically-treated fractures are included in the analysis.

The main purpose of the study is to find pearls and pitfalls in how to avoid complications when treating fractures of the distal radius. A second aim is to estimate whether rate or type of complaints have changed during the decade when surgical treatment shifted from mainly percutaneous pinning and external fixation to volar locking plates.

Lastly, the study will provide a consideration of what is considered acceptable in terms of poor outcome/complications following treatment of distal radius fractures, as viewed by The Norwegian Ministry of Health and Care.

Materials and methods: Data collected from NPE (n=800) will be analysed for type of fracture, type of initial (primary) treatment, type of complaint, reason for granted compensation and reason for rejected claims.

Current status: The study is completed and the manuscript is currently under review in a peer-reviewed international orthopaedic journal. Publication is expected in 2018.

Funding: No funding.

Review of distal radius fractures treated at Akershus University Hospital between 2007 and 2013.

Ola-Lars Hammer MD PhD student, Per Henrik Randsborg MD PhD, Erik Engebretsen MD Håkon With Solvang MD stud, Robin Nordheggem MD stud.

Introduction: A review of all patients treated at Akershus University Hospital (Ahus) for a distal radius fracture (ICD-10 S52.5) between 2007 and 2013.

Aim: Mapping the epidemiology, incidence and treatment modalities of distal radius fractures in Norway’s largest acute medical hospital.

Materials and methods: Prospective collection of data from the Wrist Fracture Register, including diagnosis, fracture classification, treatment, radiological findings, complications and number of follow-ups.

Current status: The study is completed and submission is expected in first half of 2018

Funding: No funding.

Dupuytren’s disease study: A randomized controlled trial comparing clostridium histolyticum with needle aponeurotomy.

Ingi Thor Haukksson MD PhD student, Per Henrik Randsborg MD PhD, Morten Hadvai MD, Sigurd E Hoelsbrekken MD PhD (Innlandet Hospital).

Introduction: Open surgery (fascieectomy) has traditionally been considered the gold standard of treatment for Dupuytren’s disease (DD) despite considerable risk of complications. The average recurrence rates are about forty percent for fascieectomy and sixty percent for fasciotomy after four years. There is an increasing interest in Scandinavia in the treatment of DD with Clostridium Histolyticum (Kapperud, Auxillium). The enzyme treatment may provide fewer complications and shorter sick leaves. However the enzyme is expensive and long-term effects are not well documented. More studies are needed to analyze both short and long term clinical outcome as well as cost-benefit analysis.

Another treatment of Dupuytren’s contracture is aponeurotomy, a safe and inexpensive method by which the cord is severed with a needle. These two non-operative methods have not been compared in a properly designed RCT trial. This is of importance since both treatments may provide better and more cost effective treatment compared to open surgery. Moreover, serious complications rates may be lower. The two procedures leave little scar tissue lessening the challenges posed by the reoperations. Recurrence rate of contracture following different treatments of Dupuytren’s disease differs widely in the literature, and the rate is influenced by multiple factors.

Aim: Clinical RCT comparing functional results and recurrence rate following enzymatic treatment versus needle aponeurotomy.

Materials and methods: A contracture of 30° or more in only one metacarpophalangeal (MCP) joint contracture of one of the three ulnar digits and less than 20° for the adjacent proximal interphalangeal (PIP) joint. Patients with primary disease of the hand. Total of 80 patients needed to detect difference of 13.5°.

1) Needle aponeurotomy.
2) Clostridium Histolyticum treatment.
3) Needle aponeurotomy.
4) Clostridium Histolyticum treatment.

Clinical follow-ups 1 week, 4 weeks, 16 weeks and 1 year, 2 years and 5 years. Functional outcome scores: URAM, QuickDASH, EQ5D, brief MHQ, VAS pain and VAS patient satisfaction. Total passive extension contracture reduction, recurrence rate and registration of complications.

Current status: From the start of the study in October 2013 through December 2017, 80 patients have been included and treated in the study. Follow up’s is being done continuously. Ingi Thor Haukksson plans using results of this study as a main project for his Phd thesis. Per-Henrik Randsborg is a supervisor.

Publications:

Funding:
Ahus Internal Stragetical Research Funding 2012 220 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding 2015 38 000 NOK
Sophies Minde Ortopedi AS Grant 2014 350 000 NOK
Ahus Department of Orthopaedic Surgery Publication Funding 2015 20 000 NOK

Lower extremity

Screw fixation versus hemiarthroplasty for undisplaced femoral neck fractures in elderly patients: a multicentre randomised controlled trial

Filip C Dolatowski1,2, Frede Frihagen1, Stefan Bartels1, Vidar Opland1, Jiråte Sulenty Benthi1,2, Ove Talsnes3, Sigurd Erik Hoelsbrekken1, Stein Erik Utvåg1,2

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2 Department of Orthopaedic Surgery, Akerhus University Hospital
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5 Health Services Research Unit, Akershus University Hospital
6 Department of Orthopaedic Surgery, Innlandet Hospital Trust, Elverum Hospital
7 The Norwegian Heart and Lung Patient Organisation

Background: The aim of this trial was to assess the effect of screw fixation versus hemiarthroplasty in elderly patients with undisplaced femoral neck fractures (FNFs). We hypothesised that hemiarthroplasty would be superior to screw fixation on hip function, mobility, pain, quality of life, and risk of reoperation.

Methods: 219 patients entered, and 146 patients completed this randomised controlled trial at three level III trauma hospitals in Norway. Included were ambulant patients 70 years and above, residing in the hospitals’ catchment area, with radiologically confirmed undisplaced, intracapsular FNF. Excluded were patients with pre-existing ipsilateral implants, displaced FNF, pathologic fractures, other concomitant severe injuries and...
illnesses, and/or temporarily impaired cognitive function. Between February 6, 2012, and February 6, 2015, 111 patients were allocated by envelopes to screw fixation (active comparator) and 108 patients to hemiarthroplasty (intervention). Masked assessors evaluated the patients 3, 12, and 24 months post primary surgery. Hip function was assessed using Harris Hip Score (HHS), mobility by Timed Up and Go (TUG), pain by Pain Intensity–Numerical Rating Scale, quality of life by EuroQol-5 Dimension, and reoperations were monitored.

Findings: There was no difference in hip function between the trial groups (24-month HHS [standard deviation (SD)]=74 (19) and 76 (17), respectively; mean difference adjusted for possible correlations within trial centres, surgeons, and patients (95% confidence interval (CI))=–2 (6 to 3); p=0.499). Patients allocated to hemiarthroplasty were more mobile than those allocated to screw fixation (24-month TUG (SD)=16.6 (9.5) versus 20.4 (12.8); adjusted mean difference (95% CI)=–6.2 (1.9 to 10.5); p=0.004). Further, screw fixation proved to be a risk factor for major reoperation (20% (22/110) for screw fixation versus 5% (5/108) for hemiarthroplasty; relative risk reduction (95% CI)=0.63 (0.7 to 0.6); number needed to harm=6.5; p=0.002). There was no difference in pain between the trial groups, and quality of life was higher in patients allocated to hemiarthroplasty throughout the trial period. The 24-month mortality rate was 36% (40/111) and 26% (28/108), respectively. Two patients were completely lost to follow-up.

Conclusions: Hemiarthroplasty led to improved mobility and fewer major reoperations than screw fixation in elderly patients with undisplaced FNF. Hemiarthroplasty was not superior to screw fixation in re-establishing hip function as measured by HHS. The findings suggest that elderly patients with undisplaced FNF could be offered hemiarthroplasty, rather than the currently recommended screw fixation.

Trial registration: The trial was registered at clinicaltrials.gov (NCT01770769).

Publication status: First attempt at publication: November 2017; Second: January 2018. We will resubmit this paper to international peer-reviewed scientific journals until it is accepted and published.

The influence of the hips position on measurements of posterior tilt in a valgus-impacted femoral neck fracture.

Dolatowski FC. MD PhD student, Hoelsbrekken SE. MD PhD.

Introduction: Lateral radiographs are important for the evaluation of Garden I and II femoral neck fractures. These fractures appear undisplaced in the anteroposterior view, but posterior tilt of the femoral head may still be present in the lateral view. The influence of posterior tilt is, however, debated, which could be caused by the use of non-standardized cross-table radiographs in the conflicting reports. The aim of this bone-model study was therefore to evaluate the influence of the hips position on measurements of posterior tilt.

Materials and methods: We generated models of a Garden I–II femoral neck fracture and the non-injured contralateral femur from CT reconstructions with a 3D-printer. Lateral radiographs of the models were obtained at two occasions six weeks apart. We estimated inter- and intrarater reliability by intraclass correlation coefficient (ICC). We also assessed repeatability by the repeatability coefficient (RC) and agreement by the minimal detectable change (MDC). Based on the suggested cut-off value of 20°, we reported the overall percentage and specific agreement for the choice of implant.

Results: The inter-tester ICC was 0.91 (0.84–0.94), standard error of measurement (SEM) 2.6, and minimal detectable change (MDC) 7.2. The median (range) posterior tilt for the fracture model was 21.9° (5.0, 33.8) and 23.6° (2.2, 28.6) for observer 1 and observer 2, respectively. The corresponding posterior tilt within the range of 10° IR to 40° ER and 0° to 30° flexion of the fracture model was 27.3° (24.0, 33.8) and 26.3° (24.8, 28.6).

Discussion: The range of posterior tilt measurements for positions of the proximal femur restricted from 10° IR to 40° ER and 0 to 30° flexion, was above the MDC for observer 1, and below the MDC for observer 2. These findings indicate that rotation and flexion affect measurements of posterior tilt, but the influence may be negligible for positions of the injured extremity that are clinically relevant during cross-table lateral radiographs. A larger study that accounts for variations in anatomy and fracture displacement is required to confirm these findings.

Status: Published


Eight orthopedic surgeons achieved moderate to excellent reliability measuring the preoperative posterior tilt angle in 50 Garden-I and Garden-II femoral neck fractures.

Dolatowski FC. MD PhD student, Hoelsbrekken SE. MD PhD.

Background: Studies of elderly patients with Garden-I and Garden-II femoral neck fractures (FNFs) suggest that a preoperative posterior tilt of the femoral head of at least 20° increases the risk of fixation failure. A recently published treatment algorithm recommended hemiarthroplasty over internal fixation for elderly patients with Garden-I and Garden-II FNFs and a preoperative posterior tilt of at least 20°. However, the reliability of the method used to measure the posterior tilt has not been assessed according to recommended standards for reliability trials.

Methods: Four orthopedic registrars and four consultants measured the posterior tilt angle in 50 preoperative lateral radiographs at two occasions six weeks apart. We estimated inter- and intrarater reliability by intraclass correlation coefficient (ICC). We also assessed repeatability by the repeatability coefficient (RC) and agreement by the minimal detectable change (MDC). Based on the suggested cut-off value of 20°, we reported the overall percentage and specific agreement for the choice of implant.

Results: Inter- and intrarater reliability for all raters was excellent with an ICC (95% CI) of 0.77 (0.69–0.85) and 0.77 (0.67–0.86), respectively. The RC was 13.9 and the MDC 14.1. Specific agreement for choosing arthroplasty was 61.3 and 54.6% for the first and second test occasion, respectively.

Conclusions: Eight orthopedic surgeons measured the posterior tilt in 50 Garden-I and Garden-II FNFs and achieved excellent inter- and intrarater reliability. However, variations in repeated measurements and variations in achieved measurements made by different raters, as assessed by the RC and the MDC respectively, ranged from 13.9° to 14.1°. The variations in posterior tilt measurements should be taken into account when choosing the type of implant for elderly patients with Garden-I and Garden-II femoral neck fractures.

Status: Published


Bilateral symmetrical comparison of the proximal femur using 3D-CT models.

Dolatowski FC. MD PhD student, Temmesfeld MJ. MD, Pierre-Jerome C, Borthne A, Hoelsbrekken SE.

Purpose: Superimposed three-dimensional (3D) models obtained from CT-images have been used to evaluate displacement of femoral neck fractures, but this method assumes symmetrical anatomy of normal femurs. The present study aimed to compare the spatial orientation of the left and right proximal femur, thus establishing if 3D models can be used as a reference standard for the evaluation of fracture displacement.

Methods: We generated 3D-CT-models of 20 patients with no skeletal pathology of the proximal femurs. Three

Christian Pollmann, MD, Akershus University Hospital; Asbjørn Årøen, MD, PhD, Akershus University Hospital; Johan Halse, MD, Akershus University Hospital; Stefan Bartels, MD, Akershus University Hospital; Truls Straume-Naesheim, MD, PhD, Akershus University Hospital; Jan-Harald Røtterud, MD, PhD, Akershus University Hospital; Olav Lenvik, Akershus University Hospital; Fredrik Dahl, Akershus University Hospital; Jan Erik Gjertsen, MD, PhD, Haukeland University Hospital and Norwegian Hip Fracture Register; Asbjørn Årøen, MD, PhD, Akershus University Hospital

Introduction: Elderly patients with a hip fracture have a 30-day mortality of up to 11%, and a one-year mortality of over 30% has been reported. In addition, the injury causes significant morbidity and only about 60% of the patients return to their pre-fracture level of functional independence. Orthopaedic research has mainly focused on operative techniques with little impact on morbidity and mortality. A fast-track patient pathway with focus on multimodal pain relief, stress reduction, early mobilization and nutrition constitutes a more holistic approach to the treatment of hip-fracture patients and should be suited to benefit this frail group of patients.

In addition to being the cause of considerable morbidity and mortality, a hip fracture also indicates an increased risk for a new fracture with a four-year cumulative risk of 24% being reported. An optimized patient pathway should therefore include a systematic approach to secondary prophylaxis.

Aim: Part 1: To elucidate the impact of a fast-track patient pathway for hip-fracture patients on mortality and quality of life.

Part 2: Evaluation of the feasibility of carrying out an osteoporosis treatment in all subjects with hip fracture, including the comparison of a hospital-based with an outpatient treatment regimen.

- To determine changes in bone mineral density measured by DXA of the lumbar spine, hip and femoral neck during treatment with either Zoledronate or Denosumab.
- Comparison of fracture incidence in patients receiving Zoledronate, Denosumab or no treatment (historical control group).

Materials and methods:

Part 1: Mortality and quality of life data collected in the Norwegian Hip Fracture Register will be compared for a patient cohort before and after introduction of a fast-track pathway for hip fracture patients, which was implemented in February 2014.

Part 2: Open, randomized trial between treatment with Zoledronate or Denosumab and comparison with a historical control group.

Results: The mean difference (95% CI) between positions of the left and right femoral heads was 3.1 mm (2.7-3.4) and between the left and right femoral head 2.8 mm (2.6-3.0). The minimal detectable change was 2.8 for the fovea and 2.3 for the femoral head, and the repeatability coefficients between 2.1-2.7 and 1.0-2.9, respectively. Mean difference in rotation of the foveal head was 6° (5.3-6.6) with a minimal detectable change of 8.8 and repeatability coefficients ranging from 5.8 to 10.0.

Conclusions: Distances between the left and right femoral heads were larger than what could be explained by measurement error alone, suggesting that there may be minor side-to-side differences. However, these differences are small, and 3D-CT-models can be used as a reference standard to evaluate displacement of femoral neck fractures.

Status: Published.

Molecular and imaging biomarkers in delirium and dementia

Main Researcher: Leiv Otto Watne, MD, PhD, Oslo University Hospital, Ullevaal Research group: Christian Pollmann, MD; Asbjørn Årøen, MD, Prof.; Torunn Hammer; Eline Elshaug Schanneberg; Tine Karlsrud Pettersen; Sofie Heen, Akershus University Hospital

Introduction: Delirium is characterized by sudden impairment in awareness and cognition, and is a common complication to acute somatic illness in the elderly. There is evidence that delirium can precipitate dementia in patients that are previously cognitively intact, and accelerate deterioration in those who already are demented. However, the pathophysiology of delirium is still poorly understood. Hip fracture patients are well suited to study delirium. On the one hand this frail patient group is at a high risk of developing delirium. On the other hand the majority of hip fracture patients are operated in spinal anesthesia which facilitates the procurement of cerebrospinal fluid. In contrast to blood, cerebrospinal fluid is in close contact with the brain’s neurons. The analysis of cerebrospinal fluid can therefore give important information on the pathophysiology of delirium in the brain that lead to delirium. Aim: To elucidate pathophysiologic mechanisms in delirium.

Materials and methods: Prospective observational study. Cerebrospinal fluid and blood samples are collected from hip fracture patients that are operated in spinal anesthesia. Patients are assessed for prefracture cognitive status and general health and are followed daily during their hospital stay to detect the development of delirium.

Current status: 54 patients have been included in the study. The aim is to include a total of 200 patients.

Funding: Nasjonalforeningen 9 mill NOK

Treatment and functional outcome in patients with displaced femoral neck fractures younger than 70 years.

Stefan Bartels, PhD student; PhD Stein Erik Utvåg, PhD Frede Frihagen, Department of Orthopaedic Surgery, Oslo University Hospital; PhD Cecilia Rogmark, academic advisor, Department of Orthopaedic Surgery, Skåne University Hospital Malmö and University of Lund, Sweden; PhD Jan - Erik Gjertsen, academic advisor, Norwegian Hip Fracture Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Department of Clinical Sciences, University of Bergen; PhD Wender Fiyved, Department of Orthopaedic Surgery, Barum Hospital; Filip Dolatowski, PhD student; Torbjørn Kristensen, Department of Orthopaedic Surgery Haukeland University Hospital, Bergen.

Introduction: Patients younger than 70 years with a displaced femoral neck are in serious conditions. The femoral neck fracture (FNF) is associated with low activity levels, hip pain and substantially reduced quality of life. In this study we aim to answer if patients aged 55 - 70 years with displaced and low-energy FNF treated with a total hip arthroplasty (THA) leads to better functional outcome than osteosynthesis and can patient-related factors be identified that predispose for FNF?

Aim: 1. Map the functional outcome and complications associated with displaced low-energy FNF treated with a total hip arthroplasty (THA) leads to better functional outcome than osteosynthesis and can patient-related factors be identified that predispose for FNF?

Materials and methods: Part I: In cooperation with the Norwegian Hip Fracture Registry, we published data about treatment methods and functional outcome for patients aged 55 - 70 years with displaced FNFs in the period January 2005 - December 2012. Finished Part II 50 patients aged 55 - 70 years with displaced low-energy FNF will be measured with Dexa. The results will be compared with those for an age and sex - matched normal population (150 persons). Data collection finished, analyses in progress.
Anterior Cruciate Ligament reconstruction and concomitant focal cartilage lesions: Prognosis and treatment; a systematic review.

Svend Ulstein1,2,3 Asbjørn Årøen1,2,3, Einar Sivertsen*, Jan Harald Røtterud1,3
1Akershus Universitetssykehjem, 2Institutt for klinisk medisin, Universitetet i Oslo, 3Oslo Sports Trauma Research Center, *Diakonhjemmet sykehus.

Introduction: The coincidence of Anterior Cruciate Ligament (ACL) tears and focal articular cartilage damage is common. The current literature is conflicting as to the prognosis and treatment of choice after such combined injury.

Aim: To perform a systematic review of the current literature on the prognosis after combined surgical treatment of ACL and focal cartilage injury to support evidence-based clinical decisions and improve patient outcomes.

Materials and Methods: Perform a computer-based systematic search (MEDLINE via PubMed, EMBASE via OvidSP, Cochrane Library, Web of Science databases) to identify all published literature reporting prognosis and/or treatment of combined ACL-injury and focal cartilage lesions. Systematic review of eligible studies identified in the systematic search by standardized data extraction and quality assessment. If sufficient homogeneity exist (prognosis and/or treatment) in outcome measures across included studies, a metaanalysis will be performed. In the case of considerable heterogeneity, a best-evidence synthesis will be used.

Current Status: Project registered in PROSPERO databases. Systematic search designed and performed (December 2017) and data are being analysed in Distiller SR.

Funding: Publication Ortopedisk Klinikk kr 12 000

Norwegian Cartilage Project NCP - Microfracture Study
PhD candidate Tommy Aae, Kristiansund Hospital; Professor Asbjørn Årøen, Project Manager: Per-Henrik Randsborg, MD, PhD, Project Coordinator: Heidi Hanvold, PT

The NCP is a national multicenter research group instigated by professor Asbjørn Årøen and lead by post doc Per-Henrik Randsborg at Ahus. It includes 8 different hospitals in four health regions of Norway, and the projects include two RCTs, a register study and basic science studies.

Introduction: Focal cartilage lesions in adults are common, and affect young adults. The treatment is difficult, and no current gold standard is available. Microfracture has been recommended for smaller lesions, but has never been compared with physiotherapy alone.

Aim: The aim is to compare Microfracture with arthroscopic debridement and physiotherapy.

Materials and methods: Patients aged 18-50 with isolated grade III or IV cartilage lesions of the femoral condyles or trochlea less than 2 cm² are prospectively randomized to receive either Microfracture or arthroscopic debridement. 114 patients will be included in 7 different hospitals (Ahus, Ullevål, Diakonhjemmet, Kristiansund, Ålesund, Haukeland and Haraldsplass).

Current status: Recruiting patients.


Funding: Helseforsk 2015 19 000 000 NOK

Effect of Concomitant Cartilage Lesions on Patients-Reported Outcome After Anterior Cruciate Ligament Reconstruction - A Nationwide Cohort Study From Norway and Sweden of 8470 Patients With 5-year Follow-up

Svend Ulstein1,2,3 Asbjørn Årøen1,2,3, Magnus Forssblad4, Lars Engebretsen1,2,3, Stein Håkon Låstad Lygre 7 og Jan Harald Røtterud1,3
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Background: The effect of concomitant focal cartilage lesions on patient-reported outcome after anterior cruciate ligament reconstruction (ACLR) remains to be determined.

Purpose: To evaluate (1) the effect of concomitant partial-thickness (International Cartilage Repair Society [ICRS] grades 1-2) and full-thickness (ICRS grades 3-4) cartilage lesions on patient-reported outcome 5 years after ACLR, and (2) the effect of debridement or microfracture (MF) compared with no treatment of concomitant full-thickness cartilage lesions on patient-reported outcome 5 years after ACLR.

Study Design: Cohort study (prognosis); Level of evidence, 2.

Methods: All patients that underwent unilateral primary ACLR registered in the Norwegian and Swedish National Kneé Ligament Registries from 2005 through 2008 (n = 15,783) were included in the study. At the 5-year follow-up, 8470 (54%) patients completed The Knee Injury and Osteoarthritis Outcome Score (KOOS). A subgroup of all patients with concomitant full-thickness cartilage lesions (n = 644), treated with debridement (n = 129), or MF (n = 164), or no surgical treatment (n = 351) at the time of ACLR, was included in the treatment component of the study. At the 5-year follow-up, 368 (57%) patients completed the KOOS. Linear regression models were used to estimate the effect of concomitant focal cartilage lesions on the patient-reported outcome (KOOS) 5 years after ACLR, and to estimate the effect of surgical debridement or MF of concomitant full-thickness cartilage lesions, on patient-reported outcome 5 years after ACLR.

Results: Compared to no concomitant cartilage lesions, both partial-thickness and full-thickness cartilage lesions showed statistically significant adverse effects on all KOOS-subscapes in the adjusted regression analyses at the 5-year follow-up after ACLR. Compared to no surgical treatment, there were no unadjusted or adjusted effects of debridement or MF of concomitant full-thickness cartilage lesions on the KOOS at the 5-year follow-up.

Conclusion: ACL-injured patients with concomitant cartilage lesions reported worse outcomes and less improvement of cartilage lesions 5 years after ACLR. Compared to leaving concomitant full-thickness cartilage lesions untreated at the time of ACLR, debridement and MF showed no effect on patient-reported outcome at 5-year follow-up.


Funding: None.
**Materials and methods:** The aim is to compare ACI with arthroscopic debridement and physiotherapy. Autologous Chondrocyte Implantation (ACI) has been recommended for larger lesions, but has never been compared with physiotherapy alone. The treatment is difficult, and no current gold standard is established. Focal cartilage lesions in adults are common, and affect young adults. The treatment is difficult, and a substantial number (72) of young people (17-50 years of age) in the working population. Demonstrate in an RCT that the same results could be achieved with chondrocytes as with mesenchymal stem cells.

**Aim:** The ability to heal cartilage lesion is equal for MSC and chondrocytes transplanted under a commercially available scaffold.

**Materials and methods:** Patients aged 18-50 with isolated grade III or IV cartilage lesions of the femoral condyles or trochlea larger than 2 cm² are prospectively randomized to receive either ACI or arthroscopic debridement. 82 patients will be included, and the patients will be treated at Ahus or OUS/Ulleval, and followed up at a designated research clinic at Ahus.

**Current status:** Recruiting and treating patients currently.

**Publications:** ACI vs Debridement of isolated cartilage defect of the knee, a RCT. The costs of ACI vs debridement of cartilage defects of the knee in patients aged 18-50 years. Biomarkers for successful cartilage healing after ACI.

**Funding:** Helseforsk 2015 19 000 000 NOK
Knee laxity and patient reported knee function after two different rehabilitation protocols; one with use of dynamic knee orthosis, and a control group with no knee orthosis for patients with acute isolated PCL injuries. A randomized controlled study.

Hilde Stammer PT Master, Inge Skråmm MD PhD, Christian Owesen MD, Joakim Hast PT, Rikard Moen PT, Asbjørn Årøen MD Professor, Karin Bredland PT Master (Oslo University Hospital), Ingrid Trøan PT (Oslo University Hospital), Sverre Løken MD PhD (Oslo University Hospital), Marc Strauss MD (Oslo University Hospital), Lars Engebretsen MD Professor (Oslo University Hospital).

Introduction: No high-quality evidence or evidence-based guideline is available regarding bracing/non-bracing or rehabilitation protocols for patients with acute PCL injury treated nonsurgically. Ideal management remains uncertain.

Aim: The purpose of the study is to determine whether a rehabilitation / treatment option is preferable to another, and examine whether there would be differences in knee laxity and patient reported knee function after the two different rehabilitation protocols. We are aiming to find out if there is a difference in knee laxity measured with PCL stress radiographs in patients with acute isolated PCL injury after rehabilitation with or without the use of dynamic PCL orthosis 3 and 12 months after the injury?

Materials and methods: A randomized controlled study of 70 patients with acute isolated PCL injury, with follow up after three and twelve months. Outcome measures:
- Knee laxity posterior translation by PCL stress radiographs
- Knee injury and Osteoarthritis Outcome Score (KOOS)
- International Knee Documentation Committee (IKDC)
- Knee stability test Singel-hopp

Current status: Inclusion of patients is ongoing, 16 patients are included.

Publications: Manuscript of the protocol in preparation.

Funding:
- Ahus Internal Stragetical Research Funding 2016 100 000 NOK
- Sophies Minde AS, 2011–2016 500 000 NOK
- Aase Bye and Trygve J. B. Hoff’s Fund, 2014 17 000 NOK
- The Norwegian Association of Sports Medicine, Research Grant 2015 50 000 NOK
- South-Eastern Norway Regional Health Authority, Postdoc grant 2016–2017 per year 500 000 NOK
- Over seas grant 386 000 NOK

Reconstruction of the medial patellofemoral ligament versus conservative treatment of chronic patellar instability. An RCT.

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Introduction: Patella dislocation is a serious knee injury whose peak incidence occurs in patients aged 10–17 years and is associated with a high rate of re-dislocation. Knee injuries frequently cause long-term disability and reduced physical activity among adolescents and young persons. Surgery in this patient group requires a low tolerance for complications, meaning that physical therapy might offer more successful outcomes in many knee injury cases. The proposed project studies a particular patient cohort subjected to recurrent dislocation of the patella.

Aim: The principal objective of this clinical, randomized controlled trial is to evaluate and compare knee function and symptoms in patients with recurrent patella dislocation randomized into treatment with surgical reconstruction of the medial patellofemoral ligament (MPFL) with those of patients in a standardized physiotherapy program designed to stabilize the patella and improve patient function.

Materials and methods: Patients aged 12–30 years who have experienced two or more patella dislocations are randomized into groups receiving either MPFL reconstruction or physical therapy only. Follow-ups at 3, 6, 12, and 36 months involve functional tests, validated knee scores, arthroscopic examination, and cartilage-specific MRI protocols for the knee.

Current status: The study is currently recruiting patients. The first paper assessing the baseline data has recently been resubmitted. A total of 55 patients are included in the prospective part of the study. The study group has recently reviewed the project plan and concluded that the inclusion will end after 60 patients have been included.

Publication plan:
- Re-Submitted
  1. Patients with Recurrent Lateral Patella Dislocation are Equally Affected by Their Knee Problem as The ACL Deficient, but wait Five Times Longer for Their Treatment. Planned
  2. Objective measure of knee function in patients with recurrent patella dislocation.
  4. Knee function and level of activity in patients with recurrent patella dislocation treated with MPFL reconstruction or active rehabilitation at three-year follow-up: A randomized clinical trial.
  5. Patient benefits after knee ligaments surgery: Which ligament surgery is most effective? MPFL reconstruction and ACL reconstruction at three-year follow-up evaluated with knee injury and osteoarthritis outcome scores (KOOS).
- MRI assessment of cartilage structure in the patellofemoral joint in a randomized clinical trial of MPFL reconstruction versus more conservative treatment.

Funding:
- Sophies Minde AS, 2011–2016 500 000 NOK
- Aase Bye and Trygve J. B. Hoff’s Fund, 2014 17 000 NOK
- The Norwegian Association of Sports Medicine, Research Grant 2015 50 000 NOK
- South-Eastern Norway Regional Health Authority, Postdoc grant 2016–2017 per year 500 000 NOK
- Over seas grant 386 000 NOK
Treatment results after acute Achilles tendon rupture: A randomized controlled trial comparing conservative treatment with open and minimal invasive surgery.

Ståle Myhrvold, MD, Consultant Orthopedic Surgeon, PhD student, Ahus; Sigurd Erik Hoelsbrekken, MD, PhD, Akerhus University Hospital; Lars Engebretsen, Prof., and Co-supervisor, Oslo University Hospital; Espen Brouwer, MD, Consultant Orthopedic Surgeon, Akershus University Hospital; Madeleine Amundsen, MD, Oslo University Hospital Ullevål; Maren Paus, MD, Oslo University Hospital, Ullevål; Charlotte Ferner Heglund, MD, Oslo University Hospital Ullevål; Faisal Butt, MD, Consultant Orthopedic Surgeon, Buskerud Hospital, Drammen; Wolfram Grün, MD, Østfold Hospital, Fredrikstad; Karin Rydevik, MSc, Specialist in Sports Physiotherapy, NIMI; Kjetil Waal, MD, Consultant Orthopedic Surgeon, Co-supervisor, Oslo University Hospital, Ullevål; Øyvind Paulsrud, MD, Consultant Orthopedic Surgeon, Oslo University Hospital, Ullevål

Introduction: Achilles tendon rupture can be treated operatively or nonoperatively. Since the risk of re-rupture after surgery is thought to be lower than after conservative treatment, surgery is considered to be the best treatment, despite the potential for wound complications and nerve damage. However, new rehabilitation regimes have yielded favorable treatment results after nonoperative treatment.

Aim: Since no consensus exists regarding treatment of Achilles tendon ruptures, in this study we aim to investigate whether one type of treatment is superior and whether different types of ruptures classified by ultrasound should be treated differently.

Materials and methods: This randomized controlled trial compares nonoperative treatment with open and minimal invasive surgery. The study is a collaboration among four hospitals and involves 530 patients; controls are performed blindly at NIMI and Ahus. Different methods of measuring the length of the Achilles tendon have been tested and a publication of the reliability of three different methods is accepted for publication in Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA) in 2017. A validation of the Norwegian versions of the patient-reported outcome measures of ATRS (Achilles Tendon Total Rupture Score) and FAOS (Foot and Ankle Outcome Score) is also published in KSSTA in 2017. We will also conduct a treatment–cost analysis in relation to individual results.

Current status: By the end of December 2017 we have included approximately 514 patients. Enrollment of patients will continue throughout February 2018 until we reach 530. All testing of patients and analysis of data will finish in February 2019.

Publications: We have in 2017 published both the validation of a method of measuring the length of the Achilles tendon by use of ultrasound (KSST-D-17-00632R3 Ultrasound measurement of Achilles tendon length using skin markings was more reliable than extended-field-of-view imaging) and the Norwegian validation of ATRS (KSST-D-17-00576R2 Validity and reliability of the Norwegian translation of the Achilles tendon Total Rupture Score). The main article will be published in 2019 together with the health economic study, and the PhD thesis will hopefully be finished in 2019.

Funding:
Internal Strategic Funding, Ahus, 2013: 250 000 NOK
PhD Scholarship from Helse Sør-Øst: 2 750 000 NOK
Aase Bye og Trygve J.B. Hoffs Fund for Scientific Medical Research, 2014: 17 000 NOK

Spinal injuries

The NORDSTEN-trial, a randomized multicenter study comparing different surgical procedures in patients with spinal stenosis with or without degenerative slip.

Scientific Board:
Christian Hellum MD PhD (Oslo University Hospital), Kjersti Storheim ScD Associate Professor (Oslo University Hospital), FORMI (a Communication and Research Unit in the Division of Neuroscience, Oslo University Hospital), Kari Indrekvam MD Associate Professor (Haukeland University Hospital), Jens Ivar Brox MD Professor (Oslo University Hospital), Oliver Grundnes MD PhD (Akerhus University Hospital), Tore Solberg MD Associate Professor (University Hospital of North Norway), Ivar Magne Austevoll MD PhD student (Haukeland University Hospital), Erlend Hermansen MD PhD student (Aalesund Hospital) and Frode Rekeland MD (Haukeland University Hospital).

Administrative Executive Board:
Kari Indrekvam MD Associate Professor Haukeland University Hospital), Berit Kalsvik Teige PhD (More and Romsdal Health Trust), Kjersti Storheim Associate Professor (Oslo University Hospital), FORMI, Christian Hellum MD PhD (Oslo University Hospital), Erlend Hermansen MD PhD student (Aalesund Hospital) and Ivar M Austevoll MD PhD student (Haukeland University Hospital).

Working Committee/Participating Hospitals:
Leader: Erlend Hermansen MD PhD student (Aalesund Hospital).
Members: One surgeon and one study coordinator from each participating hospital.
Participating hospitals (16): Aalesund Hospital, Hagevik Hospital, Haukeland University Hospital, Stavanger University Hospital, Oslo University Hospital, Akershus University Hospital, St. Olav University Hospital, University Hospital of North Norway, Levanger Hospital, Lillehammer Hospital, Gjøvik Hospital, Barum Hospital, Martina Hansen Hospital, Drammen Hospital, Skien Hospital, Arendal Hospital.
The three sub-studies each have a project manager:
SST: Erlend Hermansen MD PhD student (Aalesund Hospital).
DST: Ivar Magne Austevoll MD PhD student, (Haukeland University Hospital).
OC: Frode Rekeland MD (Haukeland University Hospital)
**MEDICAL STUDENT PROJECTS**

**STUDENT PROJECTS**

**Osteochondritis Dissecans of the knee**

Archana Ananthaharan medical student, Per-Henrik Randsborg post doc (Norwegian Cartilage Project).

**Introduction:** Osteochondritis Dissecans of the knee (OCD) is a well-known condition affecting children and adolescents. The lesions consist of an osteochondral part of the femoral condyle that for some unknown reason separates from the rest of the femur. This spontaneous sequestration is reversible in children, and we believe there are asymptomatic patients who spontaneously heal before symptoms. The end stage is a loose body floating in the knee, leaving a hole in the weight bearing aspect of the femoral condyle.

**Aim:** A follow up of all children and adolescents treated for an OCD at our institution between 2012 and 2016. To measure clinical, radiological and patient reported result after treatment for OCD. Another aim is to quantify the success of conservative treatment to improve our communications to future patients and to identify areas of potential improvement and further studies in our management of OCD.

**Materials and methods:** All patients aged 10-18 treated at our institution between 2012 and 2016 diagnosed with an OCD of the knee. The patients will be identified from our internal medical record system and will be invited to a designated follow-up clinic at our institution. The only exclusion criterion is patients declining participation. Patients will also provide information about return to physical activity and to sport. Complications or reoperations will be registered. A standard visual analogue scale will be used to quantify pain. Lysholm Score and KOOS score will be used to quantify knee function.

**Current status:** Datacollection and dataanalyses completed. Article in review in The knee. Publications: Patient reported outcome after treatment for OCD in the knee in children and adolescents aged 10-18 years.

**Funding:** No funding. The project is part of Archana Ananthaharan’s student project, and she will be given time through her university to collect and analyse data and write the manuscript, under supervision from the project leader.
Infections after syndesmotic screw removal:

What is the incidence at Ahus?

Thomas A Øverby Medical student,
Rune B Jakobsen MD PhD.

Introduction: Approximately 1 in 5 ankle fractures being surgically treated will need the syndesmosis to be stabilised. At Akershus University Hospital the standard method is a quadricortical screw which is routinely removed in the out-patient clinic 12 weeks after the primary operation. A recently published study has documented a high complication rate after this removal with a approximately 5 % risk of infection demanding antibiotics. This study concludes that prophylactic antibiotics are advisable before the screw is removed. This is not standard at the Orthopaedic Department at Ahus.

Aim: In the present study the objective is to establish the incidence of infections after syndesmotic screw removal in this rather large group of patient at our hospital as part of the quality control at the Orthopaedic department and subsequently conclude whether a change in routines is advisable.

Materials and methods: A full 5 year retrospective cohort of ankle fractures surgically treated between January 1, 2009 and January 1, 2014 has been identified. The electronic patient record for each patient in the cohort will be manually searched for evidence of infections after hardware removal by the main researcher as part of student research project at the Medical Faculty. The data recorded will include fracture classification, primary treatment, where and when the screw was removed and patient characteristics (age, comorbidities, smoking status).


Publications: The results will be published in an international peer-reviewed open access journal.

Funding: Funding for open-access publication granted through the University of Oslo. The project is part of Thomas A Øverby’s student project, and he will be given time through her university to collect and analyse data and write the manuscript, under supervision from the project leader.

Bruskskader i kne – sykdomsprosess og behandling

Katherine Wang Medical Student Research Program (University of Oslo), Rune B Jakobsen MD PhD, Cathrine N Engen MD PhD student and Asbjørn Årøen Professor.

Introduction: Cartilage has very limited ability to repair itself and a lesion can become progressively degenerative. It is therefore important to identify lesions early in order to treat the symptoms and hopefully prevent or delay degeneration. Current forms of treatment in Norway range from the conservative (physiotherapy) to simpler procedures (debridement and microfracture) to the more complicated (transplantation of cartilage). Studies comparing the treatment forms so far have had varying results and different subpopulations appear to respond differently to various forms of treatment.

Aim: Main project: To determine any differences in gene expression in the cartilage of three different groups of patients with knee injury or osteoarthritis.

Side project 1: To compare patient-reported outcome at 10-14 years follow-up after ACL-injury and cartilage damage with earlier follow-up results from 2-5 years (Røtterud et al. 2012) and 5-9 years (Ulstein et al. 2014) after surgery.

Side project 2: To determine if newly published results (Røtterud et al. 2016) affect surgeon’s choice of treatment for ACL-rupture with cartilage damage in Scandinavia.

Materials and methods:

Main project: A total of 48 cartilage biopsies will be collected, 16 each from three different groups of patients, (1) patients with osteoarthritis, (2) patients with ACL-injury and a focal cartilage lesion, and (3) patients with ACL-injury without cartilage damage. The biopsies are immediately frozen and then RNA is isolated and sequenced.

Side project 1: A prospective cohort-study with a matched control group using data from the Norwegian Cruciate Ligament Register (NKLR). Thirty patients registered in NKLR from 2000-2007 are included in the study with two matched controls, isolated ACL-injury, per patient.

Side project 2: Data from operation forms from the national cruciate ligament registers in Norway, Sweden, and Denmark will be used to compare the choice of treatment the baseline from 2016. Standard methods of trend estimation with regression analysis and statistical process control will be used to analyse the data.

Current status:

Main project: Cartilage biopsies collected and RNA isolated. Preparing for RNA-sequencing.

Side projects: Planning stages starting summer 2018.

Funding: The project has funding from the Medical Student Research Program at the University of Oslo and South-Eastern Norway Regional Health Authority and for Gythfeldt og frues forskningsfond.
PUBLICATIONS

Publications (peer reviewed)


Commentary


Abstracts


Randsborg PH, Røtterud JH. Ingen forskjell i fysisk aktivitetsnivå hos barn som har pådratt seg et brudd og barn som aldri har pådratt seg et brudd, målt med PAQ-C. Abstract 414, p.175.

Temmesfeld MJ, Hauksson IT, Mørch T


Dolatowski FC, Frihagen Frede, Opland V, Talnes O, Hoelsbrekken SE, Šaltytė BJ, Utvåg SE. Fixation or hip replacement for undisplaced fractures of the femoral neck in elderly patients: a national, multicentre, randomised controlled trial. p 40.

Bartels S, Gjertsen J, Frihagen F, Rogmark C, Utvåg S.E. High failure rate after internal fixation and beneficial outcome after arthroplasty in displaced femoral neck fractures in patients 55 to 70 years. 2713 patients treated with internal screw fixation, bipolar hemiarthroplasty or total hip arthroplasty from the Norwegian Hip Fracture Register. p. 63.

PRESENTATIONS

Invited lectures

Oslo Sports Trauma Research Center (OSTRC), Spring seminar at Kleivstua, May 2017.
Ulstein S. Focal cartilage lesions and ACL-reconstruction
Kjennvold S. Classification and man-agement of focal cartilage injuries
Sailer M. Predictors for infection in the knee following surgical reconstruction of the ACL in the knee

The Norwegian Orthopaedic Society's Autumn Meeting, Oslo, October 2017.
Ananthaharan A. Osteochondritis dissecans. Epidemiologi og pasientrapportert resultater fra Akershus universitetssykehus 2010-2016
Hammer O.L. Volare låseplater versus ekstern fiksasjon ved intraartikulære distale radiusfrakturer: En RCT

Other lectures

Wikerøy AKB. Two lectures at «Oppdalskurset». Mandatory course in advanced trauma surgery for orthopedic surgeons, week 7, 2017. Complex elbow fractures and difficult ankle fractures
Myhrvold S. Behandling av akutt akillesseneruptur. Lecture for Orthopedic department, Oslo University Hospital (Ullevål) November 2017.

Arranged seminars/meetings

Orthopaedic Research Group seminar, Akershus Universityssykehus, June 2017.
Myhrvold S. Erfaringer etter intern revisjon av eget forskningsprosjekt
Wang K. Bruskskader i kne – sykdomsprosess og behandling
Nordbe IV. Periprotetiske frakturer i femur ved hofteprotese
Brouwer E. Achillesseneruptur
Sailer M. Prediktorer for infeksjon etter korsbåndrekonstruksjon

Friday meeting, open for all employees at Akershus Universitetssykehus.

Utvåg SE. Ankelfraktur; "the new hip fracture"? Taktikk, Teknikk og Timing av Operativ Fiksasjon.
Owesen C. Skade på bakre korsbånd (PCL) – Epidemiologi, diagnostikk og behandling
Ulstein S. Leddbrukskade, ortopedkirurgens største utfordring?

Internal lessons at the morning meeting, Akershus Universitetssykehus

Mjønes S. Rygg: Sagital Balanse
Kjennvold S. Hofte: Valg av primærprotese
Hammer OL. Brudd: Rhabdomyolyse
Wikerøy A. Brudd: den vanskelige ankelfrakturen
Owesen C. PCL studie
March T. Hånd: Kasustikk
Wikerøy A. Komplekse ankletraumer
Sailer M. Fot: Fotens biomekanikk
Utvåg SE. Brudd: Ankelfraktur; "the new hip fracture"? Teknikk, taktikk og timing av operativ fiksasjon.
Brouwer E. Fot: Lis-Franc skade. Prinsipper i operativ behandling.
Bartels S. Behandling og resultater hos pasienter med disklokerte lårhalsbrudd mellom 55-70 år.
Jakobsen R. Kne: Ligament
Owesen C. Kne: (11 mai)
Myhrvold S. Update fra akillesstudien
Ulstein S. Brudd: Mangfold lower extremity
Ulstein S. Kne: 5 års resultater bruksstudie
Kjennvold S. Hofte: Philadelphia konsensus, grunnleggende håndtering av proteoseinfeksjoner
Wikerøy A. Kompartement/ Crush syndrom
Pollmann C. Hofte: Necrotiserende facitt
Hammer OL. Brudd: Nervskader i overeks, nevropraxi, axonometics, neurotmesis, diagnose og håndtering

Academic assignments

Supervising activity

Main supervisor for Katherine Wang, forskerlinjestudent, University of Oslo, Jakobsen R.
Main supervisor for Thomas A Øverby, studentoppgave, University of Oslo, Jakobsen R.
Main supervisor for Ingi Thor Hauksson, Akershus University Hospital, Randsborg PH.
Main supervisor for Ståle Clementsen, Akershus University Hospital, Randsborg PH.
Main supervisor for Stian Kjennvold, Akershus University Hospital, Randsborg PH.
Main supervisor for Anette Wikerøy, Akershus University Hospital, Randsborg PH.
Main supervisor for Stud.med. Archana Ananthaharan, University of Oslo, Randsborg PH.
Main supervisor for Svend Ulstein, Akershus University Hospital, Røtterud JH.
Main supervisor for Christian Owesen, Akershus University Hospital, Årøen A.
Main supervisor for Christian Pollmann, Akershus University Hospital, Årøen A.
Co-supervisor for Ståle Clementsen, Akershus University Hospital, Jakobsen RB.
Co-supervisor for Ola-Lars Hammer, Akershus University Hospital, Randsborg PH.
Co-supervisor for Tommy Frøseth Aae, Kristiansund Hospital, Randsborg PH.
Co-supervisor for Ingi Thor Hauksson, Akershus University Hospital, Årøen A.
Co-supervisor for Ståle Clementsen, Akershus University Hospital, Årøen A.
Co-supervisor for Cathrine Nørstad Engen, Akershus University Hospital and University of Oslo, Årøen A.

Reviewer

Reviewer for JBJS – Journal of Bone And Joint Surgery, Randsborg PH.
Reviewer for Acta Orthopaedica, Randsborg PH.
Reviewer for Tidsskrift for den Norske legeforening, Randsborg PH.
Reviewer for KSSTA - Knee Surgery, Sports Traumatology, Arthroscopy, Røtterud JH.
Reviewer for AJSM – American Journal of Sports Medicine, Røtterud JH.
Reviewer for KSSTA - Knee Surgery, Sports Traumatology, Arthroscopy, Straume-Næsheim T.
Reviewer for KSSTA - Knee Surgery, Sports Traumatology, Arthroscopy, Ulstein S.
Reviewer for BMJ – British Medical Journal, Ulstein S.
Reviewer for AJSM – American Journal of Sports Medicine, Årøen A.
Reviewer for Clinical Orthopaedics and Related Research, Årøen A.

Editor

Associate editor for JBIS Open Access (JBIS OA), Randsborg PH.
Faglig medarbeider Tidsskrift, Randsborg PH.
Editorial Board Member OJSM – Orthopedic Journal of Sports Medicine Røtterud JH.
MEDIA

Dagens Medisin

Per-Henrik Randsborg was interviewed by Dagens medisin regarding the article “Compensation after treatment for anterior cruciate ligament injuries: a review of compensation claims in Norway from 2005 to 2015”. In the study, Randsborg et al. determine how many patients received compensation from The Norwegian System of Patient Injury Compensation (NPE) following treatment for a cruciate ligament injury. The results were compared with data from the Norwegian Knee Ligament Register. Risk for granted compensation by using the hamstrings, compared with the use of patellars to reconstruct anterior cruciate ligament. The study show that there is a three times increased risk of receiving a compensation form the NPE if a hamstring graft was used compared to a bone-patella tendon-bone graft. You can read the full review in Dagens Medisin under the heading “Korsbåndoperasjon – Valg av operasjonsmetode påvirket utbetaling av erstatning”. Such media coverage helps to highlight the research activity in the Orthopaedic Research Group.
https://www.dagensmedisin.no/artikler/2017/12/06/flere-fikk-erstatning-etter-bruk-av-eldre-metode/

RESEARCH FUNDING 2017

Distribution of new research funding in Orthopaedic Research Group 2017

Distribution of internal and external funding granted in 2017
### Overview of existing funding for each project

<table>
<thead>
<tr>
<th>Project</th>
<th>Source</th>
<th>Amount (NOK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articular Cartilage Defect in the ACL Injured Knee. Årøen A.</td>
<td>South-Eastern Norway Regional Health Authority 2009-2015 (= 3 mill NOK)</td>
<td>787 000</td>
</tr>
<tr>
<td>Treatment result after acute Achilles tendon rupture. Hoelsbrekken SE.</td>
<td>South-Eastern Norway Regional Health Authority 2013-2019 (= 3 mill NOK)</td>
<td>380 000</td>
</tr>
<tr>
<td>The Norwegian Cartilage Project: A Multidisciplinary Approach to Improve the Treatment of Injured Articular Cartilage. Årøen A.</td>
<td>Cross-regional funds</td>
<td>16 544 000</td>
</tr>
<tr>
<td>Reconstruction of the medial patellofemoral ligament versus conservative treatment of recurrent patella dislocation. A Randomised Controlled Trial. Straume-Næsheim TM.</td>
<td>South-Eastern Norway Regional Health Authority Post Doc grant 2016-2017</td>
<td>518 000</td>
</tr>
<tr>
<td>Reconstruction of the medial patellofemoral ligament versus conservative treatment of recurrent patella dislocation. A Randomised Controlled Trial. Straume-Næsheim TM.</td>
<td>South-Eastern Norway Regional Health Authority Over seas grant 2017</td>
<td>386 000</td>
</tr>
<tr>
<td>Fractures in children. Randsborg PH.</td>
<td>Sophies Minde Ortopedi AS</td>
<td>30 000</td>
</tr>
<tr>
<td>MPFL project. Straume-Næsheim TM.</td>
<td>Sophies Minde Ortopedi AS 2011-2016</td>
<td>138 000</td>
</tr>
<tr>
<td>Undisplaced fractures of the femoral neck in the elderly. Dolatowski FC.</td>
<td>Sophies Minde Ortopedi AS 2013</td>
<td>78 000</td>
</tr>
<tr>
<td>Two to five years results after primary PCL reconstruction. Owesen C.</td>
<td>Sophies Minde Ortopedi AS 2013</td>
<td>260 000</td>
</tr>
<tr>
<td>Intramedullary nailing versus fixation of displaced midshaft clavicle fracture. Fuglesang HS.</td>
<td>Sophies Minde Ortopedi AS 2013</td>
<td>272 000</td>
</tr>
<tr>
<td>Microfracture versus mosaicplasty. Ulstein S.</td>
<td>Sophies Minde Ortopedi AS 2013</td>
<td>71 000</td>
</tr>
<tr>
<td>&quot;The Senior Study&quot; - Radius fractures in the elderly. Hammer OL.</td>
<td>Sophies Minde Ortopedi AS 2014</td>
<td>292 000</td>
</tr>
<tr>
<td>Ambulatory surgery versus inpatient surgery for ankle fractures. Sigurdsen UE.</td>
<td>Sophies Minde Ortopedi AS 2014</td>
<td>1 000</td>
</tr>
<tr>
<td>Fast-Track. Pollmann C.</td>
<td>Sophies Minde Ortopedi AS 2014</td>
<td>211 000</td>
</tr>
<tr>
<td>Dupuytren's disease study. Hauksson I.</td>
<td>Sophies Minde Ortopedi AS 2014</td>
<td>194 000</td>
</tr>
<tr>
<td>Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial. Wikerøy A.</td>
<td>Sophies Minde Ortopedi AS 2017</td>
<td>385 000</td>
</tr>
<tr>
<td>Fast-Track. Pollmann C.</td>
<td>Høgskolen i Oslo og Akershus</td>
<td>9 000</td>
</tr>
<tr>
<td>Norwegian Spinal stenosis study. Grundnes O.</td>
<td>Møre og Romsdal Health Authority grant</td>
<td>102 000</td>
</tr>
<tr>
<td>Infections with syndesmotic screws : What is the incidence? Jakobsen RB.</td>
<td>Gythfelds fond 2017</td>
<td>75 000</td>
</tr>
<tr>
<td>Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial. Wikerøy A.</td>
<td>Ahus Internal Strategical Research Funding 2017</td>
<td>150 000</td>
</tr>
<tr>
<td>Hip fracture secondary propyplaxis with either Zoledronate or Denusomab. Pollmann C.</td>
<td>Ahus Internal Strategical Research Funding 2017</td>
<td>150 000</td>
</tr>
<tr>
<td>Fixation of chondral fractures in the adolescent knee - Surgical technique and clinical outcome in 10 patients</td>
<td>Ahus Internal Strategical Research Funding 2016</td>
<td>100 000</td>
</tr>
<tr>
<td>Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial. Wikerøy A.</td>
<td>Smith &amp; Nephew 2016</td>
<td>25 000</td>
</tr>
<tr>
<td>Supplerende anatomistudie til &quot;3-D CT på innkilté lårhalsbrudd&quot;. Temmesfeld M.</td>
<td>Ortemedic AS Charnley Scholarship 2016</td>
<td>80 000</td>
</tr>
<tr>
<td>Debridement, antibiotics and implant retention (DAIR) for infected total hip arthroplasty- does the operative approach influence the functional result Pollmann C.</td>
<td>Ortemedic AS Charnley Scholarship 2017</td>
<td>100 000</td>
</tr>
<tr>
<td>Plate fixation versus intramedullary nailing of 3 and 4 part proximal humerus fractures. A prospective, double blinded randomized controlled trial. Wikerøy A.</td>
<td>The Norwegian Orthopaedic Society 2016</td>
<td>50 000</td>
</tr>
<tr>
<td>Monitoring orthopedic infections following cruciate ligament surgery and joint arthroplasty. Sailer M.</td>
<td>The Norwegian Orthopaedic Society 2017</td>
<td>50 000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>22 274 000</strong></td>
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</tbody>
</table>