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References

[1] OCY = Observed component years
[2] NZOA, The New Zealand joint registry – Eighteen year report January 1999 to December 2016. 2017.
[3] Erivan, R., Eymond, G., Villatte, G., et al., RM Pressfit cup: good preliminary results at 5 to 8 years follow-up for 189 patients. Hip Int, 2016. 26(4): p. 386-391.
[4] Clauss, M., Van Der Straeten, C., Goossens, M., Prospective five-year subsidence analysis of a cementless fully hydroxyapatite-coated femoral hip arthroplasty component. Hip Int, 2014. 24(1): p. 91-7.

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Voorwoord

Het zal u niet ontgaan zijn. In 2018 bestaat de NOV 120 jaar! Op 1 mei 1898 vond de oprichtingsvergadering plaats in het Parkhotel in Amsterdam. Daar waren destijds 21 artsen aanwezig en vandaag de dag heeft de vereniging 1408 leden! De Amerikaanse Orthopedische Vereniging (AOA) is de oudste ter wereld en daarna komt de NOV. In een eerder voorwoord sprak ik mijn verwondering al uit over het feit dat dat langer is dan de Heelkunde is verenigd, maar wist u ook dat er in 2018 ook andere jubilarissen zijn? Ik kwam op het volgende illustere rijtje (met dank aan Sander Peeters): 10 jaar na het faillissement van Lehman Brothers, 70 jaar World Health Organization, 80 jaar na introductie van de VW kever, 100 jaar na het einde van de Eerste Wereldoorlog, 200 jaar na het verschijnen van Frankenstein, 450 jaar na het begin van de 80-jarige oorlog en 1000 jaar na de slag bij Vlaardingen. In 1898 wordt ook de Koninklijke Nederlandse Automobiel Club opgericht, wordt Wilhelmina ingehuldigd, wordt de voorloper van de KNHB (Koninklijke Nederlandse Hockey Bond) opgericht, ontdekken Marie en Pierre Curie het Polonium, worden Enzo Ferrari en Simon Vestdijk geboren, onderscheidt Ernest Rutherford de alfa- en beta-straling en wordt in Rotterdam het Witte Huis opgeleverd (ooit het hoogste kantoorgebouw van Europa, mind you).

Nu is het altijd leuk om terug te kijken en te leren van de geschiedenis, maar vooruitkijken en het ontwikkelen van een toekomstbestendige visie is een heel andere tak van sport. Hoe haalt de NOV het volgende lustrum? In deze tijd van steeds verdergaande subspecialisatie is het voor veel wetenschappelijke verenigingen steeds lastiger om betekenisvol te blijven voor álle leden. Reden waarom in een aantal andere landen de orthopedische verenigingen aan invloed verliezen ten koste van opsplitsingen als de Verenigingen voor Knie, Schouder, et cetera. Bij deze evolutionair onvermijdelijke ontwikkeling van subspecialisatie moet het belang van een overkoepelende organisatie als de NOV, die wel groot genoeg is om de belangen van álle leden, dus zeker ook van de subspecialisten, te kunnen behartigen, niet onderschat worden. Generieke thema's zullen er altijd zijn en juist door vereniging van allen die zich bezighouden met de zorg voor de patiënt met problemen aan het steun- en bewegingsapparaat kunnen deze thema's op een hoger niveau bediscussieerd worden en zal de orthopedie de belangrijke speler blijven binnen de Nederlandse gezondheidszorg.

Dr. Taco Gosens, hoofdredacteur

Inhoud

Voor sommige artikelen is additioneel materiaal beschikbaar op de website www.ntv-orthopaedie.nl, waaronder kleurenfoto's en/of videobeelden. Deze artikelen zijn herkenbaar aan de volgende pictogrammen:

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- Het behartigen van de sociale belangen van de artsen die de orthopedie uitoefenen, zowel binnen de vereniging als daar buiten.

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Nederlands Tijdschrift voor Orthopaedie

Higher randomization rates needed to successfully complete the LEAK study: progress report and solutions for current issues

www.ntv-orthopaedie.nl/lowik2502/

Claudia A.M. Löwik, Frank-Christiaan B.M. Wagenaar, Walter van der Weegen, Rudolf W. Poolman, Rob G.H.H. Nelissen, Sjoerd K. Bulstra, Yvette Pronk, Karin M. Vermeulen, Marjan Wouthuyzen-Bakker, Inge van den Akker-Scheek, Martin Stevens, and Paul C. Jutte, on behalf of the LEAK study group

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Prolonged wound leakage after joint arthroplasty is reported as a symptom of prosthetic joint infection (PJI) and a risk factor for developing a PJI. However, evidence-based guidelines on the treatment and timing of treatment of prolonged wound leakage after joint arthroplasty are lacking. Hence, treatment of prolonged wound leakage varies considerably in the Dutch orthopaedic community. Therefore, Consortium Orthopaedic Research (CORE) initiated a nationwide randomized controlled trial in 38 hospitals throughout the Netherlands, in which patients with wound leakage 9-10 days after total hip and knee arthroplasty are randomly allocated to early surgical treatment (debridement, antibiotics and implant retention (DAIR) at day 9-10) or non-surgical treatment (pressure bandages, (bed) rest and wound care) / late surgical treatment (DAIR at day 16-17). In order to successfully complete this large multicenter RCT and improve our clinical care, higher randomization rates are needed. To motivate hospitals to participate in this study and stimulate orthopaedic surgeons to randomize patients we proposed several solutions for current issues and composed an online magazine to offer additional support (https://leak.orthopeden.org).

Introduction

Osteoarthritis (OA) is the most common joint disorder worldwide and is recognized as a substantial source of disability.[1] Total hip and knee arthroplasty (THA/TKA) are highly successful surgical treatment modalities for advanced OA of the hip and knee. In the Netherlands 29,520 THAs and 24,709 TKAs were performed in 2016.[2] However, one of the most serious and potentially devastating complications after joint arthroplasty is prosthetic joint infection (PJI). Prolonged wound leakage after joint arthroplasty is associated with PJI, in which wound leakage can be a symptom of PJI or a risk factor for developing a PJI.[3] Conversely, surgical wounds may also show prolonged leakage for other reasons (hematoma, seroma or fatty necrosis) and take longer to heal without development of an infection or a need for surgery. If prolonged wound leakage is caused by an infection, surgical treatment is preferred, typically consisting of debridement, antibiotics and implant retention (DAIR).[4-6] If prolonged wound leakage is caused by other factors than infection, non-surgical treatment is preferred, consisting of

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relative rest (no exercise and bed rest), pressure bandages (hip spica or knee pressure bandage) and wound care with sterile bandages.[5,7] However, as leaking wounds act as a porte d'entrée for micro-organisms, prolonged wound leakage should be considered as potentially imminent PJI.[3] Unfortunately, distinction between the types of wound leakage is often hard. Therefore, choosing the optimal treatment of prolonged wound leakage and timing of this treatment is difficult.

Surgical debridement is meant to clean the prosthesis and wound, reduce the bacterial load and break down potential early formation of a biofilm.[4,5,8] Moreover, deep tissue cultures are obtained during a DAIR to evaluate presence or absence of infection.[9] Therefore, DAIR is both a therapeutic and diagnostic procedure. When culture results show bacterial growth, PJI is confirmed and necessary treatment can be provided (for example antimicrobial treatment), by which additional more extensive surgical procedures can be prevented. However, if culture results are negative (and there is no infection), surgical treatment would beperformed unnecessarily. This may have detrimental effects on the patient's well-being as well as postoperative function of the affected joint. Moreover, performing a DAIR could even cause an infection.

Since evidence-based guidelines on the treatment and timing of treatment of prolonged wound leakage are absent, the Dutch orthopaedic community stated that this topic is an important knowledge gap during the annual inventory of Consortium Orthopaedic Research (CORE), part of the Netherlands Orthopaedic Association (NOV). In order to dissolve this knowledge gap, CORE assembled the LEakage After primary Knee and hip arthroplasty (LEAK) study group. Based on the scarce literature available, the LEAK study group hypothesized that early DAIR is helpful in treating infection and salvaging the implant in patients with prolonged wound leakage after primary THA/TKA.[5,6,10-12] To verify this hypothesis, a nationwide multicenter randomized controlled trial (RCT) is currently conducted in 38 participating hospitals throughout the Netherlands. The objective of this study is to compare the revision rates, clinical implications and cost effectiveness of early surgical treatment (DAIR at day 9-10 after index procedure) with non-surgical / late surgical treatment. In order to successfully complete this large multicenter RCT, higher randomization rates are needed. Therefore, in this article we propose several solutions for current issues to motivate hospitals to participate in the LEAK study and stimulate orthopaedic surgeons to randomize patients with prolonged wound leakage after joint arthroplasty.

Methods

Study design and procedure

A prospective nationwide multicenter RCT is currently conducted, facilitated by CORE. All patients aged 18 or older and scheduled to undergo primary THA/TKA in the participating hospitals receive written and oral information about the LEAK study. Patients with prolonged wound leakage at day 5-7 after index surgery are monitored carefully and receive non-surgical treatment. In case of prolonged wound leakage at day 9-10 after index surgery, patients are randomized to either early surgical treatment (DAIR at day 9-10) or non-surgical / late surgical treatment. Patients allocated to the non-surgical / late surgical treatment group with prolonged wound leakage at day 16-17 after index surgery will also be subjected to a DAIR, regardless of the amount of wound leakage, other clinical parameters or C-reactive protein (CRP). In case of high clinical suspicion of PJI (temperature >38.5°C, increasing wound leakage, redness, pain and increasing CRP) earlier than or at day nine after index surgery an orthopaedic surgeon can decide to perform a DAIR at that point in time without randomization. These patients are asked to sign an informed consent form for collection of their clinical data. Patients with wound leakage at day 5-7 but a dry wound at day 9-10 and patients who do not want to be randomized are also asked for consent on collection of clinical data (Figure 1). Randomization is performed by a web-based system (developed by Interactive Studios, Rosmalen, the Netherlands). Each participating hospital received individual login codes in order to register and randomize patients.

Treatment procedures

Surgical treatment consists of performing a DAIR, consisting of opening the wound, taking one culture from the intra-articular synovial fluid deep to the fascia and at least four deep-tissue cultures of periprosthetic tissue. Antibiotics are started after taking cultures and excising hematoma and necrosis. Modular components (e.g. tibial insert, femoral head and acetabular liner) are exchanged to make room for optimal debridement. The wound is lavaged thoroughly using 3-6 liters of saline (alternative is a radiated povidone iodine solution or chlorhexidine solution). Mechanical scrubbing of the visible prosthetic parts is advised. In the early surgical treatment group DAIR is performed at day 9-10 after index surgery, in the late surgical treatment group at day 16-17 after index surgery.

Non-surgical treatment consists of relative rest (bed rest and stop exercise), pressure bandages (hip

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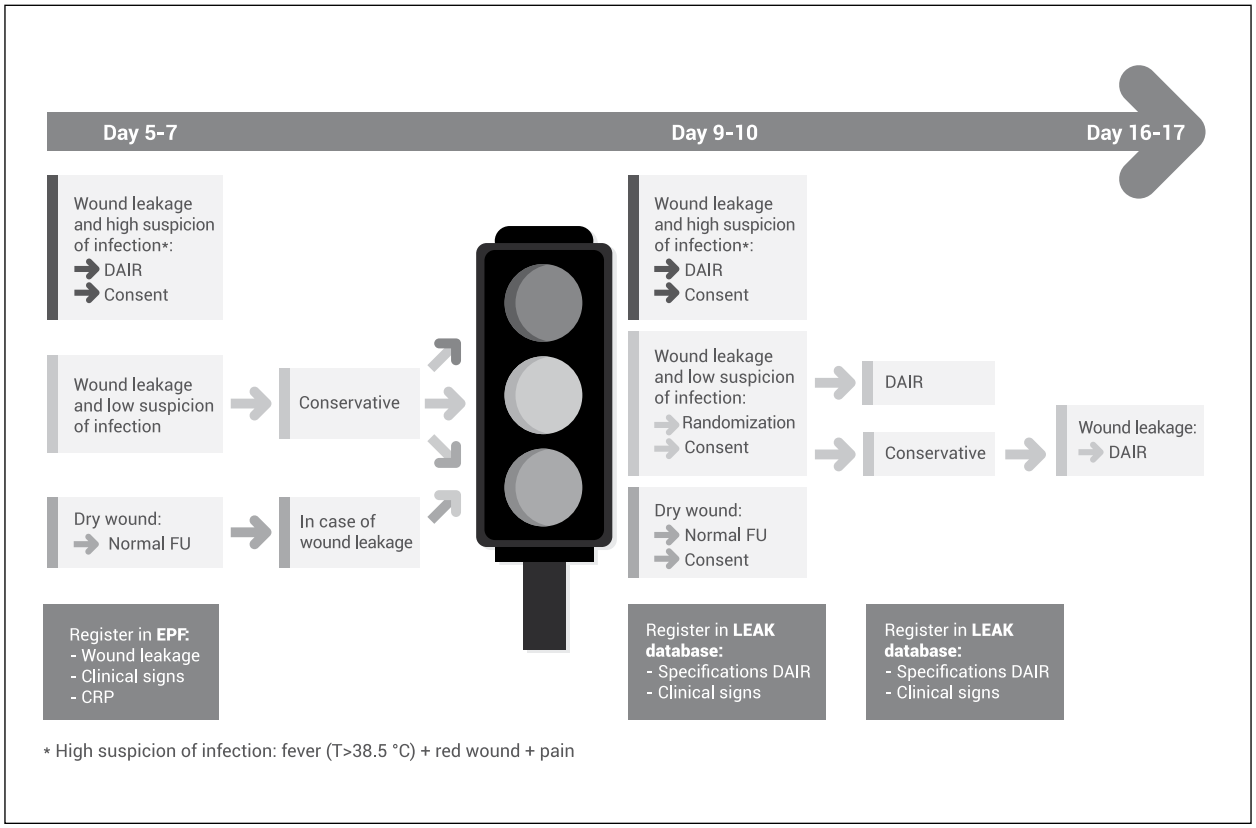

Figure 1. Flowchart of the LEAK study protocol

spica or knee pressure bandage), wound care with sterile bandages and optional hospital admission.

Measurements and outcome

Primary outcome is the percentage of re-operations for PJI within one year after index surgery in patients with early surgical treatment compared to non-surgical / late-surgical treatment. Re-operation refers to any kind of septic revision surgery (one or two stage revision, Girdlestone, arthrodesis or amputation). In addition, any other PJI treatment modalities are recorded (repeated DAIR, suppressive antibiotics or watchful neglect). Secondary outcomes are the cost effectiveness and cost utility of early surgical treatment and the impact of early surgical treatment compared to non-surgical / late surgical treatment on disease-specific and general health-related quality of life.

Clinical data from the participating patients will be recorded in a web-based database. Demographic characteristics, body mass index, American Society of Anesthesiologists (ASA) score and other risk factors for wound leakage (diabetes, smoking and use of immunosuppressant medication and anticoagulants) are recorded. Further data includes information about the index surgery, reoperation for PJI, postoperative complications, clinical signs of infection, use of antibiotics and measurement of CRP. For the patients who are allocated to surgical treatment, details of the DAIR procedure and culture results are recorded.

Randomized patients will receive questionnaires 3, 6 and 12 months after index surgery. Patients who only consented on collection of clinical data do not receive questionnaires. Disease-specific quality of life is measured by the Hip and Knee disability and Osteoarthritis Outcome Score – physical function short form (HOOS-PS/KOOS-PS)[13,14] and the Oxford Hip and Knee Score (OHS/OKS).[15,16] Health-related quality of life is measured by the 5-level EuroQol 5 dimensions (EQ-5D-5L),[17,18] of which the EuroQol visual analog scale (EQ VAS) is used to get an impression of general health from the patient's perspective.

Cost effectiveness analyses and cost utility analyses based on EQ-5D-5L-defined utilities will be performed to describe the financial consequences of both early surgical treatment and non-surgical / late surgical treatment. All items of resource use are collected at the patient level using the patient questionnaires Medical Consumption Questionnaire (iMCQ)[19] and Productivity Cost Questionnaire (iPCQ).[20]

Sample size

Since literature on the topic of treatment of prolonged wound leakage is scarce, the power analysis is mainly based on expert opinion formulated

during the international PJI consensus meeting and consensus among the members of the LEAK study group. The assumption is that patients with prolonged wound leakage at day 9-10 after index surgery will develop PJI and 20% of patients will necessitate revision surgery. It is hypothesized that early surgical treatment (DAIR at day 9-10) will prevent 50% of PJIs, and consequently revision surgery, compared to non-surgical / late surgical treatment. In order to detect this 50% reduction with 80% power at a significance level of 0.05, 155 patients are required in the early surgical treatment group and 155 in the non-surgical / late surgical treatment group. With an expected drop-out rate of approximately 20%, a sample size of 194 patients per group is needed, making up a total required study population of 388 patients.

Ethics and dissemination

The study is approved by the Institutional Review Board of University Medical Center Groningen (METc2016/418). The Review Board of each participating hospital has examined and approved the local feasibility. Eligible patients receive oral and written information about the study and sign an informed consent form in order to participate. The study is registered in the Dutch Trial Registry with number NTR 5960.

Progress report

In order to dissolve the important knowledge gap on the treatment of prolonged wound leakage after joint arthroplasty, CORE assembled the LEAK study group, who designed the LEAK study. ZonMW (The Netherlands Organization for Health Research and Development) approved the design of the study and provided €300,000 euro funding by June 2016. NOV provided additional funding of €30,000 euro. The Institutional Review Board of the University Medical Center Groningen approved the study in October 2016.

With the participation of 38 Dutch hospitals, the LEAK study is the first CORE project that is carried out on such a large scale. The collaboration of these hospitals is very important, as it could provide a solid base for performing large-scale research in an orthopaedic consortium in the future. In order to further expand this consortium a letter was sent to the remaining hospitals in the Netherlands to inform them about the LEAK study and to invite these hospitals to participate in the study. The study is still open for additional participating hospitals.

The LEAK study started at 1 February 2017. Due to lengthy procedures for examination of local feasibility in participating hospitals, only eight hospitals started in February 2017. Gradually additional hospitals received local approval for the start of the study. At this point in time, 32 hospitals commenced inclusion of patients. Unfortunately, inclusion of patients with prolonged wound leakage is behind on schedule, especially inclusion of randomized patients. On January 1st 2018 96 patients were included in total, of which 27 patients were randomized. The remaining patients signed informed consent for collection of clinical data. According to the inclusion schedule it was estimated that 228 patients would have been randomized at this point in time.

There are several reasons for the lower number of included patients. First of all, the above-mentioned delay at thestart of the study in numerous participating hospitals was not accounted for. The delay was caused by extensive examinations by the local committee, which turned out to be as extensive as approval of the Institutional Review Board of the initiating center, even though conducting a second medical ethical examination is against national regulations. Secondly, it appears that orthopaedic surgeons are hesitant to randomize patients, as they are used to their own treatment methods and believe that either early surgical or non-surgical / late surgical treatment is better for a particular patient, even though there is no evidence to support that statement. An offered solution for this is assessment of the patient by an independent orthopaedic surgeon (i.e. a colleague). Moreover, in each regional training group of orthopaedics (ROGO) an ambassador is available for consultation about eligibility of a patient. An overview of the ambassadors is displayed in the online magazine of the LEAK study (https://leak.orthopeden.org).

Thirdly, follow-up of patients after joint arthroplasty varies widely in Dutch hospitals, and has a large impact on the ability to identify eligible patients for randomization. Identification progresses smoothly in hospitals in which patients stay admitted until the wound is dry. However, in most hospitals patients are discharged 1-3 days after surgery and therefore identification depends on patients contacting the hospital in time for randomization. For these hospitals it is vital to give patients clear instructions to contact the hospital if wound leakage persists longer than 5-7 days. Finally, orthopaedic surgeons are worried to receive bad reviews on inspection by insurance companies, as registered revision rates and infection rates may increase by performing more DAIR procedures in the context of the LEAK study. To prevent incorrect interpretation of revision rates and infection rates the NOV sent a letter to the major insurance companies to clarify

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these concerns. Therefore, participating hospitals do not need to worry about this issue anymore.
In addition to the above-mentioned resolutions, we composed an online magazine to offer additional support to participating hospitals. In this magazine experts in the field of prosthetic joint infections described their view on the importance of large-scale research carried out by an orthopaedic consortium (https://leak.orthopeden.org). As this study is worldwide the first RCT on the topic of prolonged wound leakage, by which it can contribute largely to the knowledge on treatment of wound leakage, it is important to overcome above-mentioned issues. Moreover, the formation of CORE could lead to conduction of additional large-scale research, which would be impossible for hospitals individually.

Discussion

Objective of the LEAK study is to determine the outcome of early surgical treatment (DAIR at day 9-10) versus non-surgical / late surgical treatment in patients with prolonged wound leakage after joint arthroplasty. As literature on the best treatment and optimal timing of treatment for wound leakage is scarce, performing early surgical treatment at day 9-10 is a compromise between the recommendation of the most recent PJI consensus meeting and usual clinical practice in the Netherlands.[21] Given that to our knowledge comparative studies on early surgical treatment versus non-surgical / late surgical treatment are lacking, the LEAK study is the first RCT on this topic. Due to this lack of evidence, clinical practice for the treatment of prolonged wound leakage varies considerably, as demonstrated by a nationwide survey among Dutch orthopaedic surgeons.[21] An important dilemma is that not all postoperative prolonged wound leakages are a proxy for PJI, but delaying surgical treatment for too long may result in undertreatment and development of a PJI.
To successfully complete the LEAK study with a sufficient number of included patients, there are several issues to overcome. We proposed several solutions and composed an online magazine to stimulate and aid participating hospitals with the inclusion of eligible patients. In close collaboration with a large number of Dutch hospitals we aim to find evidence on the best treatment of prolonged wound leakage in order to develop an evidence-based guideline which could be implemented in national and global clinical practice, eventually resulting in an improvement of quality of life for patients and significant cost savings in orthopaedic healthcare.

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Disclosure statement
The authors declare having no potential conflict of interests with regard to the authorship and publication of articles following this study.

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Ethical approval
The study is approved by the Institutional Review Board of the University Medical Center Groningen (METc2016/418). The Review Board of each participating hospital has examined and approved the local feasibility. The study will be conducted according to the principles of the Medical Research Involving Human Subjects Act (WMO), the Good Clinical Practice standard (GCP) and the Declaration of Helsinki. The study is registered in the Dutch Trial Registry with number NTR 5960.

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Q fever spondylodiscitis in a man with unexplained low back pain, with a follow-up of 6 years after treatment

Dennis S.M.G. Kruijntjens, Yvette Hoendervangers, Jan-Willem H.C. Daemen, Astrid M.L. Oude Lashof and Paul C. Willems

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Introduction

Spondylodiscitis is a combined infection of the intervertebral disc and the adjacent vertebral bodies. It is most often caused by *Staphylococcos aureus* and in 10 to 30% of patients blood and tissue cultures remain negative.[1] Only 4 cases have been reported in literature about spondylodiscitis caused by *Coxiella burnetii*.[2-4] *C. burnetii* is a gram negative microorganism which causes Q fever.[5] We will report a patient with a combined multilevel spondylodiscitis and an infected contained rupture of an abdominal aortic aneurysm, caused by *C. burnetii*, with a follow-up of more than 6 years after treatment.

Patient

In October 2010 a 71-year old man was referred to our hospital with an acute aggravation of low back pain without neurologic radiation. For more than a year he had suffered from low back pain, for which no explanation could be found in the referral hospital. Conventional pain treatment, as well as local and epidural infiltrations were insufficient to relieve his pain. Further analysis showed an infrarenal abdominal aortic aneurysm of 4.3 cm. His relevant medical history included a femoro-femoral crossover bypass from the right to the left side because of iliac occlusive vascular disease, hypertension and hypercholesterolemia. During the last 6 months he had lost 11kg of weight because of a decreased appetite. He had never had a fever. An ultrasound and a CT of the abdomen showed an aortic aneurysm with a hematoma surrounding the left psoas muscle with osteolysis of the ventral side of the second lumbar vertebra. Because of these findings patient was acutely referred to our academic hospital.

When the patient arrived in our hospital he did not feel sick. On physical examination he was hemodynamically stable with a blood pressure of 190/110 mmHg, a heart rate of 75 beats per minute, saturation of 98% with 1 liter of oxygen and a body temperature of 37.0˚C. His abdomen showed no signs of peritonitis, had normal peristalsis, there was no percussion pain,

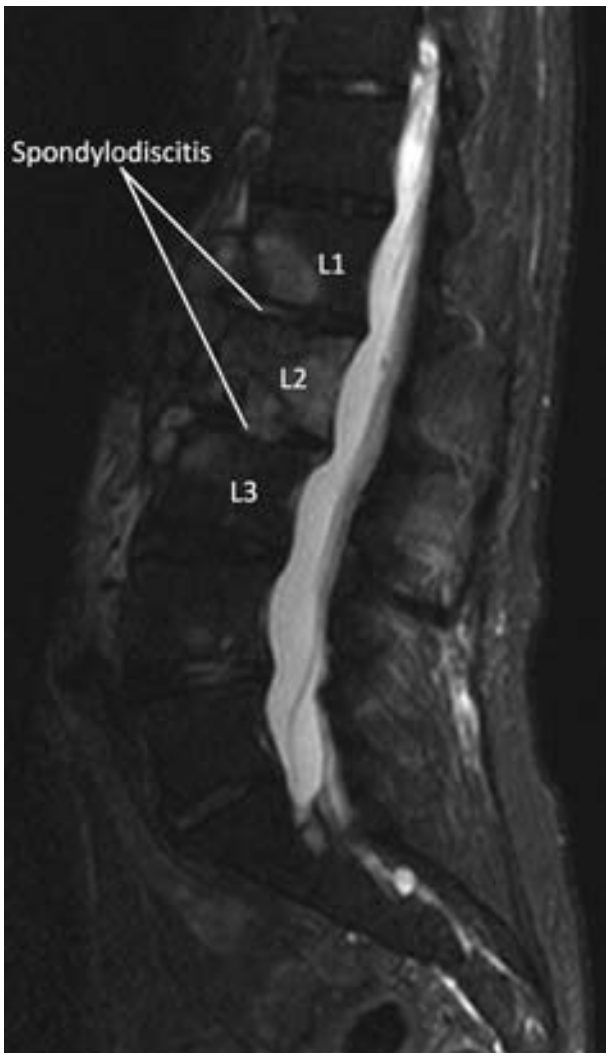

Figure 1A. Sagital MRI view: Spondylodiscitis of L1-L2 and L2-L3.

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and on palpation a pulsating, non-tender swelling was identified. His spine was not painful on examination and no neurological abnormalities were found. Peripheral pulsations were also normal.

Intervention

Additional blood tests showed slightly elevated C-reactive protein (21 mg/L), erytrocyte sedimentation rate (36 mm/h) and leucocytes (10.1 x 10^9/L). An MRI scan and a CT angiography showed spondylodiscitis of the intervertebral discs L1-L2 and L2-L3, with a hematoma surrounding the left psoas muscle, indicating a contained rupture of the abdominal aortic aneurysm (Figure 1A-B).

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Comparison

As the patient lived in a rural area which was endemic for Q fever in the period of 2007-2010, and because of the abdominal aortic aneurysm, a chronic infection caused by *Coxiella burnetii* was included in the differential diagnosis.[6] Blood cultures were taken, interferon gamma release assay (IGRA) for *Mycobacterium tuberculosis*, and serology for *Bartonella, Treponema pallidum (syphilis)* and *C. burnetii* was performed.
The patient underwent an axillofemoral bypass with resection of the aortic aneurysm. Because of

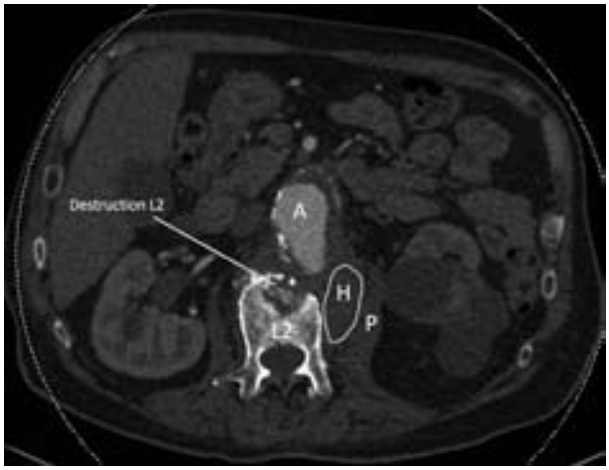

Figure 1B. Axial CT view: Hematoma (H) surrounding the aorta (A) and left psoas muscle (P), indicating a contained rupture, and destruction of the second lumbar vertebra (L2).

contiguous ingrowth with subsequent disc destruction and osteolysis, the intervertebral discs L1-L2 and L2-L3 were excised and filled with autologous bone from the iliac crest. Macroscopically, the excised intervertebral discs appeared like granulomatous tissue. This was confirmed by histopathological examination. Bacterial and microbacterial cultures of the excised discs were negative, IGRA for *M. tuberculosis* was negative and the serologic

Table 1. Overview of 4 cases from literature.

Reference	Patients characteristics	Symptoms	Laboratory test	Imaging
Jayet et al[10]	91 year old male	Lumbar pain, fever	C-reactive protein 16mg/L	MRI and CT: L3 ivory vertebra, bilateral paravertebral abscesses and ruptured abdominal aorta aneurysm
Landais et al[4]	64 year old male	Night fever, worsened lumbar pain	C-reactive protein 33 mg/L	MRI: L2-3 spondylodicitis, paravertebral abscess and psoas infiltration, ultrasound: no presence of valvular lesions, aortic aneurysm
Stokes et al[13]	67 year old male	Acute lower back and abdominal pain	C-reactive protein 156.8mg/L	CT: saccular pseudoaneurysm with destruction of L1-2-3 vertebral bodies MRI: L2-3 disk space destruction with spinal stenosis
Current case report	71 year old male	Acute aggravating low back pain	C-reactive protein 21mg/L	MRI and CT: spondylodiscitis of intervertebral discs L1-2 and L2-3, with haematoma surrounding aorta and left psoas muscle

test results for *Bartonella* and *Treponema pallidum* were also negative. On the other hand, the antibodies against *C. burnetii* phase 1 and 2 antigenes (Complement Fixation Titer (CFT) > 1:320), and *C. burnetii* Polymerase Chain Reaction (PCR) on the removed intervertebral disc tissue were strongly positive, indicating a chronic Q fever infection.[7] Systemic treatment was started with Hydroxychloroquine (200mg tid) and Doxycycline (100mg bid) for 18 months.

Outcome

The postoperative phase was uneventful. Patient was discharged 18 days postoperatively and mobilized in a lumbar plaster cast for 6 months. Six month postoperatively his complaints of back pain were completely cured. An MRI still showed findings of infectious signs around the second lumbar vertebra. Hereafter follow-up was continued in the referral hospital. There was insufficient serum at the day of surgery to perform a Q fever immunofluorescence assay (IFA), which is used to determine the exact period of treatment. After 6 months of treatment the IFA IgG phase 1 was 1:4096, after 12 months 1:1024 and hereafter it remained stable. When this fourfold decrease of the titer was reached, systemic treatment was stopped after 18 months.
In December 2013 the patient felt fine. The MRI showed improvement with no signs of a retaining abcess. During further follow-up a PET-CT was made 5 years after the surgical treatment. This PET-CT revealed the known destruction of the second lumber vertebra, but no pathologic activity around it. More than 6 years after the treatment patient feels fine, only complaining of mild back pain radiating to both his groins.

Literature

The largest Q fever outbreak ever reported in literature, accounted for almost 4,000 reported infected humans in The Netherlands in 2007-2009.[6,8] This number probably is a large underestimation of the true amount of infected patients, as recent reports show that there are probably more than 40,000 infected patients, especially in the region of 's-Hertogenbosch.[8] After this outbreak interventions were undertaken to decrease the number of Q fever infections. However, it is not likely that Q fever will disappear completely, because *C. Burnetii* can survive for a long time in the environment and because *C. Burnetii* also infects animals other than goats.[9] Although the epidemic was contested, Q fever remains endemic in The Netherlands.[9]
An acute infection with *C. burnetii* is asymptomatic in 60% of infected cases, whereas about 40% may experience a flu-like self-limiting disease, atypical

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Microbiological analysis	When thought of Q fever	Q fever serology	Operation	Time of follow-up
Sputum smears for pulmonary tuberculosis: negative	After sputum smears for tuberculosis remained negative	Phase 1: IgG estimated to 8000	Open aorta repair and biopsy	20 months
General blood cultures: negative Tuberculin test: negative	After blood cultures and tuberculin test were negative	Phase1: IgG400, IgA 25 Phase2: IgG 800, IgA50	Disco-vertebral biopsy	2 months
Aerobic and anaerobic bacterial and fungal cultures, general blood cultures: negative Mycoplasma Brucella and mycocbacteria: negative	One month after treatment with piperacillin/ tazobactam and vancomycin	Phase1: IgG 1:2048 Phase 2: IgG 1:1024	Open redo repair of aorta	18 months after leaving hospital deceased
General blood cultures, general bacterial cultures, interferon gamma release assay for mycobacterium tuberculosis and serology for bartonella, and lues: negative	Immediately	Phase 1 and 2: ≥320	Axillofemoral bypass and debridement with autologous bone graft L1-L2	7 years

pneumonia, or hepatitis.[5] About 1 to 5% of all cases may progress to a chronic infection, possibly leading to life-threatening complications.[5,6] Endocarditis always was the most important complication of chronic Q fever (60-70%), followed by vascular infections (8%), for example an infected abdominal aortic aneurysm or an infected vascular prosthesis.[3,5] The associations of infected aneurysms with contiguous spondylitis have been reported in 17.5% of the cases.[10] In the outbreak in The Netherlands, the percentage of patients with an infected aneurysm or an infected vascular prosthesis is substantially higher.[11,12] The mortality of untreated chronic Q fever is 60%.7 The mortality of chronic vascular infections with *C. burnetii* is 24%.[11]

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The combination of an infected abdominal aortic aneurysm and spondylodiscitis has been reported before with causative agents such as *Salmonella, Mycobacterium bovis, Streptococcus pneumonia, Campylobacter coli* and *Gemella haemolysans*.[4] Two patients were reported in literature with a Q fever spondylodiscitis who had an infected aortic bifurcation prothesis.[4,13] Only one patient with a contained rupture of an abdominal aortic aneurysm and a single level Q fever spondylodiscitis has been reported in literature.[10] Our patient suffered from a multilevel Q fever spondylodiscitis, most probably caused by a direct spread from the infected abdominal aortic aneurysm.

As shown in Table 1, the three Q fever cases described above[4,10,13] including our patient were all male and had had long term back pain before. Only two patients presented with fever. In an acute infection with *C. burnetii*, serology shows IgG against phase II antigens, while in a chronic infection it shows IgG against phase I antigens.[14] The results of the serology can help to distinguish between an acute or a chronic infection.

Recommendation

This case illustrates that in patients with unexplained low back pain, who live in rural areas, especially if they are known with underlying vascular disease, a spondylodiscitis caused by *C. burnetii* should be considered. At present in The Netherlands, still many patients with chronic Q fever are undiagnosed.[5,8] Of interest, clinical knowledge and awareness is essential to detect these patients early and install adequate treatment before irreversible damage occurs.

Conflict of interest statement

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Multidisciplinary management in knee traumatology

Vinay V. Balesar, Egbert Krug, Jaap F. Hamming and Ewoud R. van Arkel

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A case report is presented of a patient with bilateral knee injury resulting in occlusion of the popliteal artery, tibial plateau fracture and multiple ligament ruptures. This case underlines the importance of multidisciplinary collaboration and proper communication in high energy trauma management.

Introduction

In daily practice, it is increasingly more common for treatment of patients to extend across multiple specialties. An example is the recommendation to develop orthopaedic-geriatric units in hospitals for proximal femoral fractures in the elderly.[1,2] Another example is oncological prosthetics where several branches of surgery, orthopaedics and rehabilitation medicine play an important role.[3] This case report underlines the role of multidisciplinary collaboration in the treatment of complicated knee traumatology.

Patient

A 57-year-old man is admitted to Trauma Centre A concerning a motorcycle accident. The primary survey is performed by the trauma surgeon and emergency physician. The blood pressure is 141/93 mmHg, the pulse 73/min and the oxygen saturation level is 100%. The patient was passing roadworks and fell with a speed of 50 km/h with the motorcycle landing on his left leg, leaving his right leg in a 'weird' position. The patient's history showed no significant findings.

On physical examination, the left knee is painful and swollen, while the right knee shows hypoesthesia with negative pulsations over the posterior tibial (ATP) and dorsalis pedis (ADP) arteries. On conventional knee X-rays the right knee is dislocated and a tibial plateau fracture Schatzker II is seen on the left side.

Intervention

In the emergency room the right knee is repositioned, however no improvement in sensibility and vascularization is seen. CT-angiography shows a complete occlusion of the popliteal artery. The patient is brought to the operation room where the vascular surgeon bypasses the occlusion with a venous femoropopliteal construction resulting in positive pulsations of the ATP and ADP. The operated knee is placed in a Velcro splint and the patient is started on anticoagulants (phenprocoumon). The left knee is put in a brace for pain relief and the patient is announced for the multidisciplinary meeting for the next day.

During the multidisciplinary meeting the orthopaedics, vascular surgery, trauma surgery and rehabilitation medicine decide to postpone the osteosynthesis of the tibial plateau fracture for a week because of the soft tissue swelling. It is advised to test the stability of both knees under anesthesia due to high probability of multiple ligament injuries. Trauma Centre B, where the expertise of ligament reconstruction is present, is consulted. After consultation, it is decided to assess the patient after six weeks in Centre B and to stabilize the right knee with external fixation. The patient is then screened by the rehabilitation specialist and provisionally signed up for a rehabilitation centre.

A week after trauma, the second surgery is performed. Testing of the left knee under anesthesia shows a ruptured anterior cruciate ligament (ACL), posterior cruciate ligament (PCL) and medial collateral ligament (MCL). Open reduction and internal fixation of the tibial plateau fracture is performed on the left knee with plate osteosynthesis. Testing of the right knee shows a ruptured ACL, PCL, MCL and lateral collateral ligament (LCL). The right knee is fixed externally. One week later the patient is discharged with home care and walking devices. In consultation with trauma, vascular surgery and the orthopaedic teams in both centres, it is decided to treat the left knee 6 to 12 weeks non-weight-bearing exercise-stable and to keep the right knee non-weight-bearing until the outpatient clinic appointment in Centre B.

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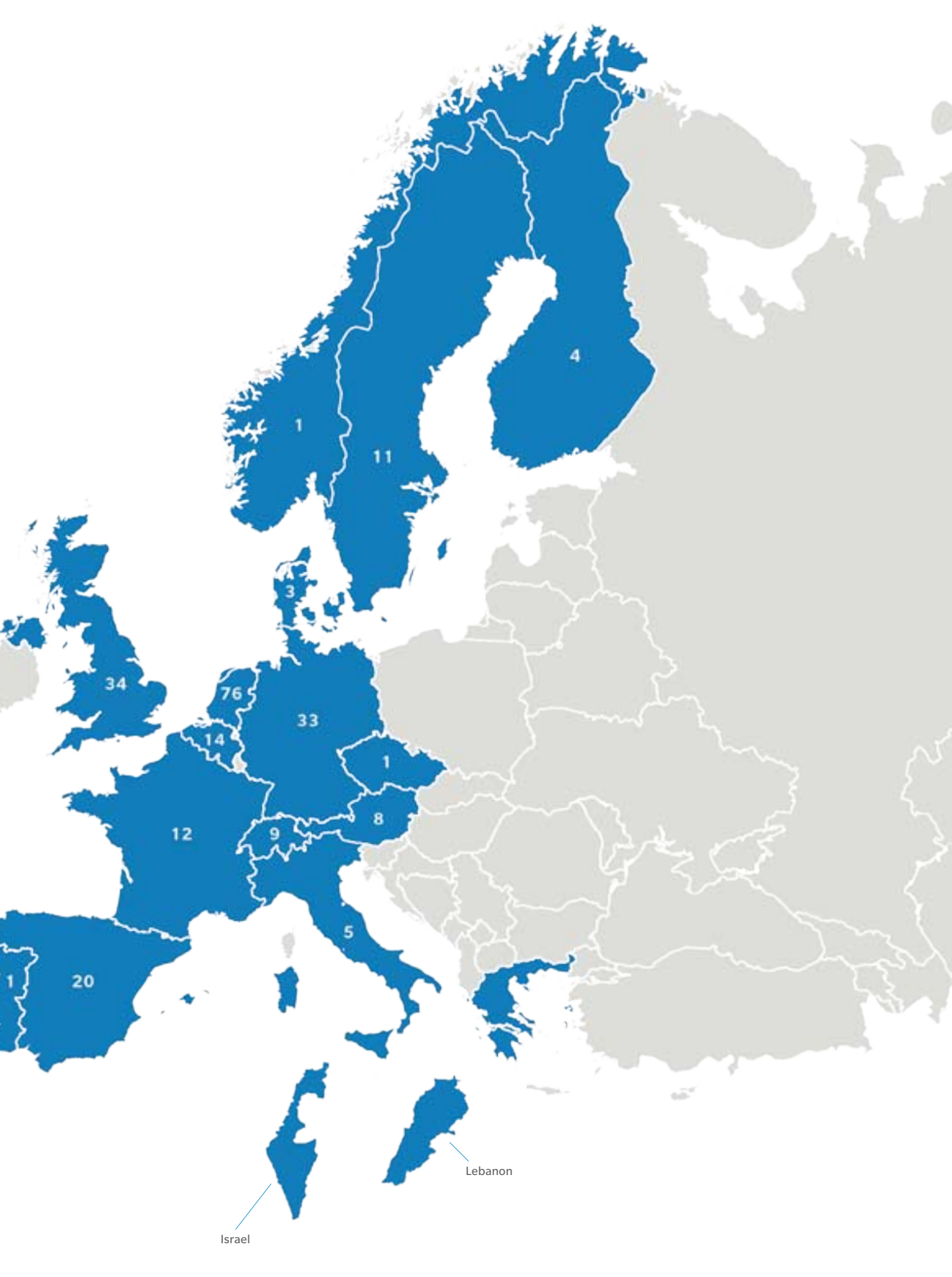
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Six weeks after trauma an acquaintance and preoperative consultation is conducted in Centre B for ligament reconstruction of the right knee. Two months after trauma the external fixator is removed and an ACL and posterolateral corner reconstruction is performed. Before surgery the free range of movement of the right knee is very limited and arthrolysis from 0 to 90 degrees is done. An allograft (donor tendon) is used for the ACL reconstruction. The after-treatment of the operated right knee is 6 weeks non-weight-bearing immobilization, partial loading from 6 to 10 weeks building up to full weight-bearing after 10 weeks. Immediately after surgery intensive physiotherapy with a hinged brace and continuous passive motion (CPM), because of the arthrolysis, is started. In consultation with Centre A, where the osteosynthesis plate was placed for the tibial plateau fracture of the left knee, the complete after-treatment of this knee is taken over by Centre B.

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Four months after the ligament reconstruction of the right knee, the CPM has been discontinued and the patient shows a flexion function of 100 degrees with full extension. Seven months after surgery, the flexion has increased to 110 and no instability complaints are given even without the hinged brace. The left knee remains unstable with positive examination tests for ACL, PCL and MCL ruptures, which are confirmed on MRI and CT. One year after the ligament reconstruction of the right knee, an extensive reconstruction of the left knee is performed. Peroperatively, the fracture is fully consolidated and the osteosynthesis plate is removed. PCL reconstruction is performed with an allograft (donor tendon) followed by ACL reconstruction with two hamstring tendons, which are also used for the MCL reconstruction. The after-treatment is 6 weeks non-weight-bearing immobilization followed by 6 weeks partial loading expanding to full weight bearing. Once again, intensive physiotherapy is started.

Comparison

The treatment of an unstable tibial plateau fracture is open reduction and internal fixation followed by 6 to 12 weeks non-weight-bearing.[4] In our case, the left knee was treated according to protocol. The excessive injury of the right knee had no specific protocol to follow and limited treatment strategies are known in literature.

Early diagnosis and treatment of knee trauma accompanied with popliteal vascular injury is essential.[5] Patients with injured limbs, unclear ATP/ADP palpations and sensorimotor dysfunction require further examination such as duplex ultrasonography or CT-angiography. In a single centre study in patients with knee dislocations, Doppler ultrasound was carried out in 8 (89%) cases and it successfully excluded 7 (78%) cases for vascular trauma and identified 1 (11%) injury with reduced flow. This case underwent computed angiography scan and later surgery revealed a popliteal artery trauma.[6]

Immobilization for two months after a knee dislocation is not the standard after-treatment. Only a few case reports describe the combination of knee dislocation, popliteal artery injury with femoropopliteal bypass and complete ligament rupture.[5–9] The after-treatment is controversial, varying from functional with integrated range of motion braces to complete immobilization. None of the case reports describe the duration of the immobilization or braces and the function of the knee during follow-up. The treatment strategy is in all cases divided in two stages: early repositioning and a femoropopliteal bypass followed by orthopedic reconstruction of the ligaments several weeks later.

Outcome

One and a half years after the accident the patient is able to fully use both the left and right knee without a brace or other devices. Physical examination shows full function of both knees with good stability of all ligaments. The regular vascular checks in Centre A were continued after the accident. Nine months after trauma the patient had stopped with the usage of phenprocoumon and switched to acetylsalicylic acid. Due to normal duplex ultrasonography of the femoropopliteal bypass, the vascular surgeon stopped the regular checks.

Discussion

In the described case report, a large multidisciplinary team was involved, consisting of the emergency doctor, anesthetist, intensivist, vascular surgeon, trauma surgeon, orthopaedic surgeons from two centers, rehabilitation physician, endocrinologist (for the osteoporosis screening) and the physiotherapists. At each stage of treatment, close consultation between the involved disciplines resulted in rapid stabilization and initial treatment of the patient and optimization of the subsequent steps and timing of the definitive reconstructions. Eventually, this resulted in a satisfactory end result.

Knee dislocation accompanied with popliteal artery injury and complete ligament rupture is a serious condition where a prompt diagnosis and an

early revascularization are crucial for successful functional results.[8] There is a high risk of a limb ischemia reperfusion injury after revascularization in case of ischemia lasting for more than 6 hours. Recommendations for the management of suspected vascular injuries in the lower limb have evolved from mandatory exploration of all suspected injuries to routine imaging.[7] Both duplex ultrasonography and CT-angiography are adequate for screening vascular pathology. In our case, the patient experienced hypoesthesia over the lower limb combined with negative pulsations of the ATP and ADP suggesting vascular injury. Duplex ultrasonography was unavailable outside office hours and the injury was thought more extensive, consequently we chose CT-angiography which confirmed occlusion of the popliteal artery.

After the multidisciplinary meeting it was advised to test the stability of both knees under anesthesia due to high probability of multiple ligament injuries. Additionally, the knee with popliteal artery injury was put in a Velcro splint and was not immobilized to prevent recurrent dislocation. The external fixation was placed one week after the vascular reconstruction. Short multidisciplinary consultation before the first surgery is recommended and could have suggested, in this case, to test both knees during the femoropopliteal bypass and directly immobilize the operated knee. However, it is controversial in literature to immobilize the lower limb after knee dislocation resulting in vascular injury and complete ligament rupture. We chose to not use a hinged brace since it only offers stabilization in medial-lateral direction. Both ACL and PCL ligaments were ruptured increasing the risk of recurrent dislocation, also in a brace. Therefore, we chose to externally fixate the knee until the ACL and PCL reconstruction was performed to prevent recurrent dislocation and to protect the femoropopliteal bypass.

In this case, the injuries were severe and surgical reconstruction was performed in three stages. First, repositioning the knee dislocation followed by femoropopliteal bypass to vascularize the lower limb. Then open reduction and internal fixation of the tibial plateau fracture of the other knee combined with external fixation of the knee with vascular injury. Lastly, the patient underwent reconstructive orthopedic surgery of the ligaments for both knees resulting in full function of both knees with good stability of all ligaments and successful preservation of the femoropopliteal bypass.

We presented the entire spectrum of knee dislocation, tibial plateau fracture, injury of the popliteal artery and multiple ligament rupture. This combination of lesions has been rarely reported. The importance of multidisciplinary teams in the treatment of such multitrauma patients is evident, in particular for the timing and correct order of actions and decisions to achieve a favorable outcome.

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Disclosure statement
The authors declare that they have no conflict of interest.

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Acute calcific tendinitis of the shoulder mimicking septic arthritis – a case report

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Hugo H. Hermanussen, Lieke M.A. de Vries and William C. Neve

It is important to differentiate between calcific tendinitis and septic arthritis: calcific tendinitis is a mild and self-limiting disease, whereas septic arthritis can lead to rapid cartilage destruction. The latter can result in significant chronic joint dysfunction and pain, even if treated properly. Therefore, prompt recognition, rapid and aggressive antimicrobial therapy and surgical treatment are essential in case of septic arthritis. On the other hand, in most cases of calcific tendinitis, a conservative approach is appropriate. We present a patient with acute calcific tendinitis of the shoulder mimicking the clinical presentation of septic arthritis, including the unusual findings of highly elevated infection parameters and purulent- like fluid with aspiration.

Introduction

Calcific tendinitis of the shoulder is a self-limiting disorder, caused by deposition of calcium hydroxyapatite. In most patients, the supraspinatus tendon appears to be the most affected.[1-3] This condition predominantly affects patients between 30 and 60 years, with a slight predilection for women.[4] Calcific tendinitis can be classified into three stages: pre-calcific (silent), calcific (subacromial pain syndrome), and post-calcific (acute).[5] Patients with acute calcific tendinitis present with severe, disabling pain that occurs spontaneously, usually in the morning.[2] The onset of pain is often sudden and insidious. Nevertheless, symptoms generally resolve over a short period of time and most patients are symptom-free in a few weeks after the onset of symptoms.[1-3,6] We present a case with acute calcific tendinitis of the shoulder, mimicking septic arthritis. To our knowledge, only one similar case has been reported in literature.[7] Our aim, by presenting this case, is to raise awareness of the possibility of elevated infection parameters and findings of purulent like fluid with joint aspiration in cases of acute calcific tendinitis.

Patient

A 59-year old woman with no known history of shoulder problems visited a general practitioner two days prior to hospitalization with acute left shoulder pain. The general practitioner administered a subacromial injection with corticosteroids and anaesthetics. Two days later she presented at the orthopaedic outpatient clinic with acute pain of the left shoulder, which started suddenly with an insidious onset and developed gradually over a period of 5 days. She was not ill nor had a fever or chills. She had no history of trauma, recent drug intake or any similar episodes. Physical examination revealed a patient in severe pain with swelling and erythema over the left shoulder. Furthermore, extreme limited range of motion of the shoulder was observed, both actively and passively. Plain X-rays showed a subluxation of the glenohumeral joint and severe subacromial calcifications, Figure 1. Additional examinations were performed to rule out

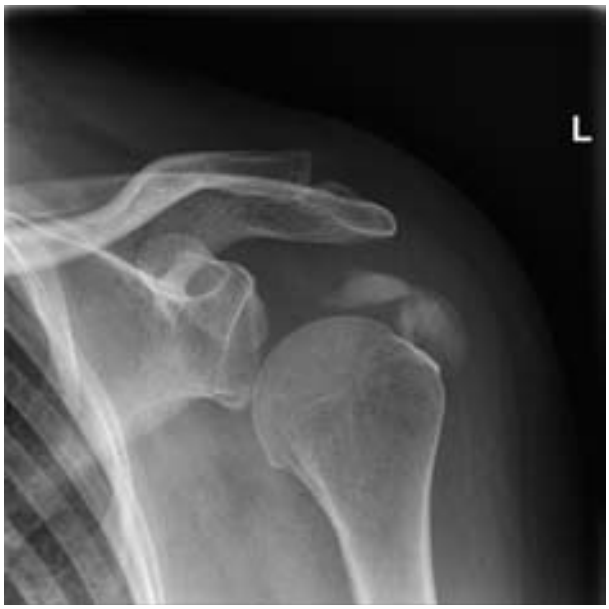

Figure 1. X-ray of left shoulder which shows a subluxation of the gleno-humeral joint and severe subacromial calcifications.

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a septic arthritis or bursitis. Laboratory investigations revealed an elevated C-reactive protein (CRP) of 142-mg/l and leucocyte count of 13.9x10e9/l. Subacromial aspiration was performed, without imaging support (not available due to logistic reasons), to acquire fluid for culture. A thick cloudy fluid was aspirated and sent for microbiological evaluation and immediate gram staining. The gram stain examination did not show bacteria growth. Many leucocytes were reported but not specifically counted. Overall, a preliminary diagnosis of acute calcific tendinitis was made. Diagnosis of septic arthritis or bursitis was unlikely, but not completely rejected. Therefore, the patient was admitted for observation overnight.

Intervention

The severe pain persisted during the next day. Since there was still a mild suspicion of acute septic arthritis or bursitis, an arthroscopy was performed. The goal of this intervention was to evaluate the gleno-humeral joint intra-articulary and in case a septic arthritis was detected, lavage and debridement could be carried out immediately. During surgery, no gleno-humeral intra-articular abnormalities were found (no hydrops or purulent synovial fluid) with the exception of an area of grade 2 chondropathy located at the glenoid and the caput humerus. Large quantities of deliquescent calcium deposits were visible in the supraspinatus tendon and some synovitis in the subacromial bursa was identified, Figure 2. The rotator cuff appeared to be thin, but no full-thickness rupture was observed. Synovial fluid and synovial biopsies were collected for culture and pathology analysis. Furthermore, the calcium deposits were removed with a shaver. The most likely postoperative diagnosis was acute calcific tendinitis. After surgery, naproxen 500 mg twice a day was prescribed. In addition, intravenous flucloxacilline and gentamycine were prescribed to treat the indecisive diagnosis of septic arthritis or bursitis. During the following three days, the patients' clinical status improved with resolution of pain and an increase in passive and active range of motion of the shoulder. Since there was still no sign of bacterial growth, antibiotic treatment was stopped and range-of-motion exercises were started.

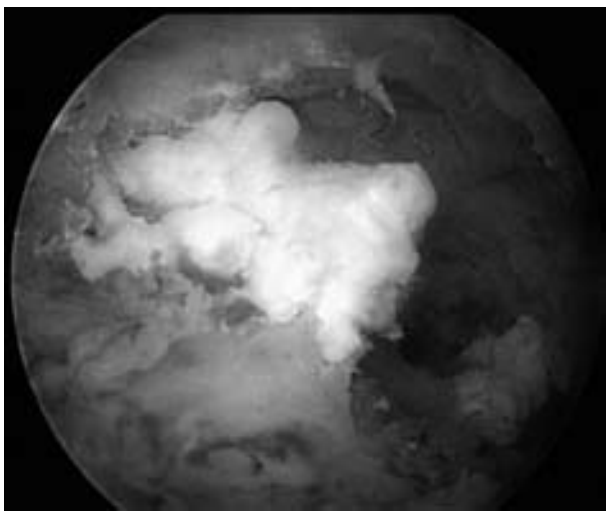

Figure 2. Large quantities of deliquescent calcium evacuated from the supraspinatus tendon during arthroscopy.

Comparison

Therapeutic strategies of calcific tendinitis of the shoulder include non-invasive and surgical treatments, often combined with physical therapy for joint mobilization. Non-operative treatment, such as non-steroidal anti-inflammatory drugs (NSAIDs), physio therapy, ultrasound guided needling and lavage (barbotage), extra-corporal shock wave therapy (ESWT), and injection therapy, is widely recommended and reported to be successful in most cases.[2,3,8-11] For example, Cho et al. reported excellent to good results in 72% of their patients after the administration of NSAIDs and passive shoulder stretching exercises.[12] Furthermore, Oudelaar et al. analysed the short-term results of 431 patients with calcific tendinitis in the rotator cuff after barbotage treatment.[14] They concluded that 74% of their patients experienced a complete relief of symptoms 6 months after treatment. The role of ESWT for treating calcific tendinitis is still being evaluated.[1,15] ESWT has been studied extensively, with a large heterogeneity in reported treatment protocols and large differences in shockwave intensity. Shock waves have been suggested to cause fragmentation and cavitation within calcifications, leading to disorganization and disintegration of the deposits into the adjacent subacromial bursa and resorption by local inflammatory response.[16] Reported adverse effects are rare and seem to be related to blood flow disruption and include intramuscular haematoma, bone marrow oedema, and a few case reports of osteonecrosis of the humeral head.[17,18]

If non-operative treatment is unsuccessful in terms of resolution of calcifications, and if there is still persistent pain, operative treatment to remove the calcific deposits has been advocated.[19,20] Verstraelen et al. systematically reviewed the literature to determine the preferable surgical strategy for these patients: acromioplasty with removal of the calcific deposits, acromioplasty without re-

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moval of the calcific deposits, or solely debridement of the calcific deposits.[21] They found good clinical and functional results after all three procedures but suggest further research to determine a favourable surgical strategy, since there is a lack of high-quality comparative studies. Surgery has long been the treatment of choice for patients with severe conservative therapy resistant calcific tendinitis. The most commonly reported postoperative complications are stiffness and pain. This must be taken into account when one is appreciating the high clinical success rate of arthroscopic removal. The recent focus on minimally invasive treatment modalities suggests that surgery is gradually being superseded by these new options in the management of calcific tendinitis. Therefore, Louwerens et al. recently performed a systematic review to investigate if there is a sustainable positive effect on the outcome after treatment with high-energy ESWT or barbotage in comparison with arthroscopic surgery.[13] Twenty-two studies were included (1,258 shoulders). Overall, good to excellent clinical outcomes were achieved after treatment with either high-energy ESWT, ultrasound guided needling, or arthroscopic surgery, with an improvement in the Constant-Murley score ranging between 26.3 and 41.5 points after 1 year. No severe side effects or long-term complications were encountered in any of the treatments.

Outcome

Three weeks after arthroscopy, the patient was almost fully recovered. She was asymptomatic without evidence of increasing joint effusion or joint inflammation. There was no more need for pain medication. Examination of the involved joint showed a full painless range-of-motion. The serum infection parameters were improved to normal values with a CRP of 2 mg/l and leucocytes of 7.2x10e9/l. The final cultures were negative.

Discussion

There are three phases of calcific tendinitis: precalcific stage, calcific stage, and the post-calcific stage.[5] The pre-calcific stage involves the metaplasia of the tenocytes to chondrocytes and is usually asymptomatic. During the calcific stage the calcium deposits in the metaplastic tissue consolidate into dense homogenous and well-delineated areas of calcium.[1,10] This stage is usually asymptomatic, but patients may experience symptoms similar to mild subacromial pain syndrome. The final, post-calcific or resorptive stage is the stage during which most patients seek attention for their symptoms. During this phase there is a proliferation of blood vessels and vascularity into the calcified area.[5] As the body phagocytoses the calcium deposits, the resultant inflammatory response creates increasing intratendinous pressure and subsequent pain.[19] The acute symptoms of the resorptive phase may require the clinician to consider a septic process.[22] The diagnosis of calcific tendinitis is established by history and physical examination in conjunction with radiographs. Plain X-rays with internal and external rotation views are the first additional examinations recommended in suspected tendinitis.[1] In the acute phase, joint effusion may be observed. In this case it seemed that joint effusion due to a septic arthritis caused the subluxation of the gleno-humeral joint, however this was either caused by bursitis or by pseudoparalysis due to peri-articular muscular inactivity induced by pain. Ultrasonic examination is reported to be more sensitive in detecting calcium deposits within the cuff and improve accuracy during joint aspiration.[11,23] This would also have been valuable in the presented case, though ultrasound was not available due to logistic reasons.

In most cases of calcific tendinitis laboratory findings are normal.[7] However, in the presented case the calcium evoked an inflammatory synovitis, raising the leucocyte count and CRP. The diagnosis of septic arthritis or bursitis is often considered straightforward, but as shown in this case, acute tendinitis calcarea could present itself in a similar way as septic arthritis or bursitis, including elevated infection parameters. This emphasizes the importance of additional imaging.

Conclusion and recommendation

This case demonstrates a presentation of acute calcific tendinitis of the shoulder mimicking septic arthritis or bursitis. Findings of elevated CRP and leucocyte counts are possible, without a septic underlying pathology. If plain X-rays or ultrasonographic examination reveal findings of calcific tendinitis, synovial joint and bursa aspiration cultures should be obtained by using imaging support. When the cultures do not show any signs of infection, i.e. negative gram stain and no elevated leucocyte count, surgical treatment is usually not necessary because acute calcific tendinitis almost always has a self-limiting nature. However, surgery may be considered in some cases of severe acute calcific tendinitis with severe pain to achieve a quick relief of symptoms, barbotage and corticosteroid injection are recommended to consider as the first treatment options. Antibiotic treatment is not necessary in case of acute calcific tendinitis.

In conclusion, calcific tendinitis of the shoulder could be accompanied by elevated infection parameters suggesting septic arthritis, in need of urgent treatment. Therefore thorough diagnostics are of paramount importance to differentiate between joint sepsis and calcific tendinitis.

Disclosure statement
Nothing to disclose.

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25 jaar Nederlands Tijdschrift voor Orthopaedie

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Dit jaar viert de Nederlandse Orthopaedische Vereniging (NOV) haar 120-jarig bestaan. Ook voor het Nederlands Tijdschrift voor Orthopaedie is 2018 een feestelijk jaar. In mei 1994 verscheen de eerste editie van het Nederlands Tijdschrift voor Orthopaedie (NTvO) en dus vieren we met deze huidige editie het 25-jarig jubileum van het NTvO.
De allereerste editie bevatte drie wetenschappelijke artikelen, een fraai overzicht van voorgedragen nieuwe NOV leden inclusief kort cv, een proefschriftbespreking en de nog steeds bestaande rubriek 'verenigingsnieuws' (nu: 'van de vereniging'). Bovendien was er zelfs ruimte voor 11 abstracts van de 12 presentaties gegeven op de NOV voorjaarsvergadering, evenals een samenvatting van de notulen van de ledenvergaderingen.
De hoofdredactie was in handen van Jan de Waal Malefijt. Na de Waal Malefijt is het NTvO lange tijd door Arthur de Gast geleid en sinds 2012 vervult Taco Gosens deze taak. Het initiatief voor het NTvO kwam (mede) van Wim Keessen, die het NTvO vanuit de 'Noviteiten' (wilde) opzetten. Helaas overleed hij voordat de eerste editie verscheen.


Nederlands Tijdschrift voor
Orthopaedie
Mei 1994, 1e jaargang, nr.1
Het dorsale plaatje bij Weber-B-fracturen van de enkel: een bruikbaar alternatief
Osteosynthese van lumbale spondylolysis
Peroneus brevis transpositie bij enkelinstabiliteit
Voorjaarsvergadering van de NOV
Verenigingsnieuws
Officieel orgaan van de Nederlandse Orthopaedische Vereniging

Hoewel een aantal zaken gelijk is gebleven – het blad verschijnt nog steeds vier keer per jaar en bevat nog immer zowel wetenschappelijke manuscripten als verenigingsnieuws – heeft het NTvO de nodige veranderingen ondergaan.
De oplage is meer dan verdubbeld van 625 naar 1550 exemplaren, manuscripten worden nu online aangeleverd in plaats van met de post, de redactieleden krijgen geen dikke stapels drukproeven meer maar slechts één pdf, en er komt in het productieproces geen printje meer aan te pas; het hele NTvO gaat rechtstreeks vanaf de computer naar de pers.
Arwin Baan heeft als uitgever alle veranderingen van 25 jaar NTvO meegemaakt. Van een ' kantoortje aan huis' bij de toenmalige hoofdredacteur, waarbij diens vrouw de rol van secretaresse vervulde en de 'day-to-day operations' deed tot een volledige en gestroomlijnde redactieraad met ondersteuning en coördinatie vanuit de uitgever. Tegenwoordig gaan wisselingen in samenstelling van de redactieraad volgens een strak schema, in plaats van wanneer iemand er mee wilde stoppen of dat er een wisseling van hoofdredacteur was. Wetenschappelijke artikelen worden nu beoordeeld volgens het 'peer-review principe', in plaats van alleen door de redactie, en er is een overstap gemaakt van Nederlandstalige inhoud naar Engelstalig (2014). Ook is het aantal rubrieken flink uitgebreid en waar het NTvO aanvankelijk meer aandacht voor verenigingsnieuws had is er nu meer ruimte voor wetenschappelijke publicaties.
Wat zullen de komende 25 jaar brengen voor het NTvO? Mogelijk een verdere digitalisering? Nieuwe technologieën of nieuwe media via welke het tijdschrift wordt verspreid? Inhoudelijk een verdere professionalisering? Een streven naar pubmed indexering? In de eerste editie schreef toenmalig hoofdredacteur de Waal Malefijt dat het NTvO gezien kan worden als het visitekaartje van de vereniging. In datzelfde nummer werd oud-collega arts Anton Tsjechow (1895) geciteerd: 'Een goed tijdschrift redden is even nuttig als 20.000 operaties verrichten'. Deze twee belangrijke opdrachten voor het NTvO lijken nog immer actueel en vormen een mooi uitgangspunt voor de redactie voor de komende 25 jaar.

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Nederlands Tijdschrift voor Orthopaedie

Eponymous terms in orthopedic surgery

Colles fracture

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The original

The classical paper 'On the fracture of the carpal extremity of the radius' was written and published in 1814 by Abraham Colles.[1] His observations were made clinically, without the aid of dissection or radiology: This fracture takes place about an inch and a half {auth: 3.8 cm} above the carpal extremity of the radius, and exhibits the following appearances. The posterior surface of the limb presents a considerable deformity; for a depression is seen in the fore-arm, about an inch and a half above the end of this bone, while a considerable swelling occupies the wrist and metacarpus. Indeed, the carpus and base of metacarpus appear to be thrown backward so much, as on first view to excite a suspicion that the carpus has been dislocated forward. On viewing the anterior surface of the limb, we observe a considerable fullness, as if caused by the flexor tendons being thrown forwards. The fullness extends upwards to about one-third of the length of the fore-arm, and terminates below at the upper edge of the annular ligament of the wrist. The extremity of the ulna is seen projecting towards the palm and inner edge of the limb: the degree, however, in which this projection takes place, is different in different instances.

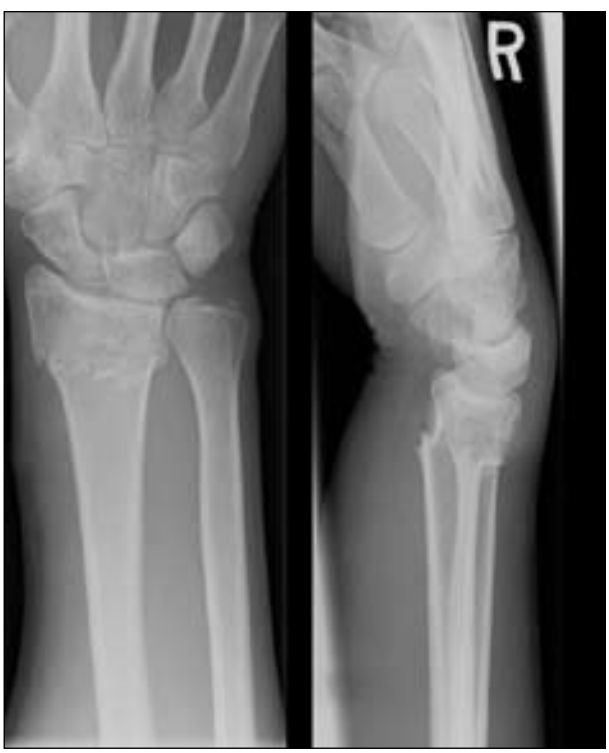

Figure 1. A Colles fracture.

On treatment he wrote: If the surgeon locks his hand in that of the patient's, and makes extension, even with a moderate force, he restores the limb to its natural form; but the distortion of the limb instantly returns on the extension being removed. […] It is obvious that, in the treatment of this fracture, our attention should be principally directed to guard against the carpal end of the radius being drawn backwards. For this purpose, while assistants hold the limb, in a middle state between pronation and supination, let a thick and firm compress be applied transversely in the anterior surface of the limb, at the seat of the fracture, taking care that it shall not press on the ulna; let this be bound on firmly with a roller and then let a tin splint, formed to the shape of the arm, be applied to both its anterior an posterior surfaces.

The use of plaster for immobilization of fractures was introduced 1854 by Antonius Mathijsen and took over the role of splints of other materials.

The man

Abraham Colles (July 23, 1773 - November 16, 1843) was born in Millmount, Ireland, as son of a marble quarry owner. It is said that Colles found an anatomy book of the local doctor, dr. Butler, after a flood had swept part of this doctor's house away. Upon returning the book to Butler, the doctor offered the book to the young Colles. This influenced Colles' choice of his future profession. In 1790 he became an apprentice to Philip Woodroffe, a surgeon at the Doctor Steevens' Hospital, Dublin. He received his doctoral in Medicine in 1797 in Edinburgh. He then walked in eight days from Edinburgh to London to work with Sir Astley Paston Cooper. In 1797 he started teaching anatomy and surgery at the Meath Hospital, Dublin. In 1799 he succeeded his old mentor Woodroffe at Doctor Steevens' Hospital where he would work until giving up his chair in surgery in 1841. In 1802 and 1830 he was elected president of the Royal College of Surgeons in Ireland, the first time at the age of 29. In 1839 he

Figure 2. Abraham Colles.

was offered a baronetcy that he refused. The last years of his life he was plagued by bouts of gout, diarrhoea and heart failure. This did not stop him to practice almost until his death. The day of his burial, which was a state funeral, all students of medicine had the day off to honour his memory.[2,3]

The clinical implication

It has been estimated that, at 50 years of age, a white woman in USA or Northern Europe has a 15% life- time risk of a distal radius fracture; whereas a man has a lifetime risk of just over 2%.[4,5] Since the group of elderly people is growing, the incidence of distal radius fractures is likely to do also.[5] Therefore the knowledge of the fracture, reduction method and immobilisation is important basic knowledge of colleagues treating fractures on a daily basis.

Matthijs P. Somford

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Nederlands Tijdschrift voor Orthopaedie

Proefschriften

Forefoot disorders. Definitions, treatment and outcome measurement. Joost Schrier, Rijksuniversiteit Groningen, 3 July 2017

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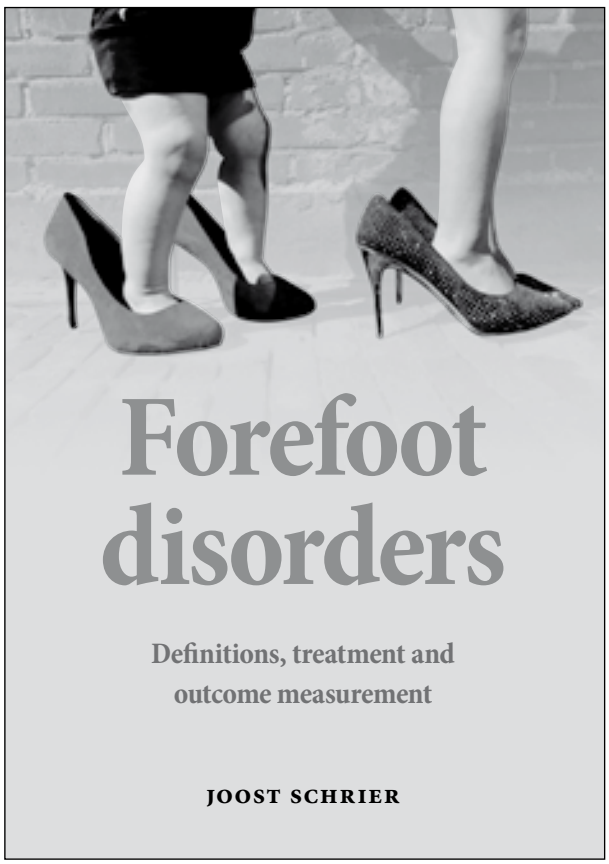
The main goal of this thesis was to evaluate the standard of present nomenclature (definition) and treatment of certain forefoot problems. Specifically lesser toe deformities and rheumatoid forefoot deformity are studied. From here, definitions and treatment protocols are advised. Furthermore, patient reported outcome measures (PROMs) of patients with hallux valgus are illuminated.
This thesis comprises four literature studies, two randomized clinical trials and one manuscript on current standards in Dutch orthopaedic practice.
The following conclusions are drawn:

1. A complete absence of consensus on lesser toe deformities was found after evaluation of Dutch orthopaedic practice, by means of a digital questionnaire. A wide variation of definitions and treatment modalities were reported for claw, hammer and mallet toes.
2. A remarkable variation of definitions of hammer, claw and mallet toes was found in the literature. We proposed that extension of the metatarsophalangeal (MTP) joint should be the discriminating factor. A hammer toe is defined as a rigid flexion deformity of the proximal interphalangeal joint (PIPJ); a claw toe has an additional rigid extension deformity of the MTPJ.
3. Our RCT demonstrated no clinical difference between PIP joint resection and fusion, as surgical treatment for claw toe deformity. Both procedures resulted in a good to excellent outcome in pain and activity scores. However, a statistically significant difference was found regarding the toe alignment in the sagittal plane, in favor of the PIP joint fusion. It remains disputable if this better alignment would justify PIP joint fusion as a preferred procedure.
4. Our literature study showed little consensus on diagnosis and treatment of rheumatoid forefoot deformity. Metatarsal head (MTH) resection continues to be the most advocated procedure for rheumatoid forefoot deformity. However, improved pharmacology may result in less destruction of the MTH, which legitimates a MTH saving procedure. By choice individual patient-related factors should be a guideline in the decisional process.
5. Our RCT demonstrated neither clinical nor radiographic differences between metatarsal head (MTH) resection and MTH preservation, as surgical treatment for rheumatoid forefoot deformity. Both procedures resulted in considerable improvement of pain and activity scores. Treatment of rheumatoid forefoot deformity should be individualized. A MTP joint preserving procedure is advised in the case of a less severe deformity. If there is a more destructed MTPJ, then a MTP joint resection procedure is the recommended treatment.
6. Our literature study showed that the MOXFQ scored best on specific psychometric criteria, as PROM for patients with hallux valgus. The SEFAS may be an good alternative, however it contains less items which are regarded as important by patients with foot/ ankle complaints.
7. Our randomized study showed that the response rate, of patients with hallux valgus, who were

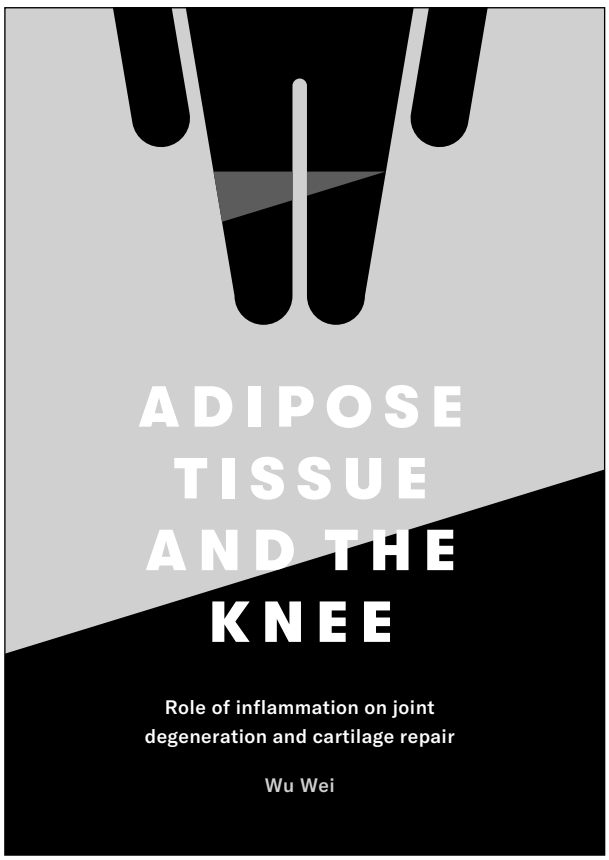


asked to fill out PROMs, was significantly higher from traditional mail and telephone, than the response from email. Age and gender did not influence the response rate in our study. Thus, the effect of a complete switch to electronic questionnaires may have a negative impact on the response rates.

https://www.orthopeden.org/base/downloads/proefschrift-joost-schier.pdf

Adipose tissue and the knee: role of inflammation on joint degeneration and cartilage repair. Wu Wei, Erasmus Universiteit Rotterdam, 20 October 2017

Cartilage defects can be treated by cartilage repair operations. However, the results of these operations are negatively influenced by inflammation. In obesity, there is more adipose tissue and the adipose tissue is also inflamed. Most adipose tissue are located subcutaneously. However, there is also a large adipose tissue inside the knee, called the infrapatellar fat pad or Hoffa's fat pad. This intra-articular adipose tissue can also become inflamed. The present thesis shows that this fat pad is not the same as subcutaneous fat. The Hoffa's fat pad secretes factors that can negatively influence the knee joint and cartilage repair. This could be caused by the secretion of factor PGF2a and the presence of pro-inflammatory macrophages. The negative effects could partially be counteracted by addition of triamcinolone acetonide. This means that in the future, medication can be used to modulate the Hoffa's fat pad and therefore improve the joint environment for cartilage repair.



Besides Hoffa's fat pad inflammation, we also investigated the effect of extra-articular adipose tissue inflammation on joint disease and cartilage repair. By using mouse models, we have shown that obesity and obesity related metabolic and inflammatory changes do not always lead to cartilage damage nor are they negative for cartilage repair. These experiments provide evidence that there is variability in how obesity related systemic effects can affect degenerative joint disease and cartilage repair. Future studies on the relationship between obesity, adipose tissue and cartilage repair could focus on this variability to uncover novel therapeutic targets.

https://www.orthopeden.org/downloads/298/Adipose%20tissue%20and%20the%20knee%20-%20Role%20of%20inflammation%20on%20joint%20degeneration%20and%20cartilage%20repair.pdf

NOV-Voorjaarcongres *Fotografie: Olaf Smit*





Algemene Leden Vergadering


Denis Dartée Lid van Verdienste


Wetenschappelijk programma

Debat specialist versus generalist

Diner

Vol 25

jun '18

De bijzondere kant van het werk van Lennard van den Boom

"Het zit een beetje in mijn natuur om me in te zetten voor het gezamenlijk belang"

In elke editie van NTvO vertelt een NOV-lid over de bijzondere kant van zijn of haar werk. Dit keer is dat Lennard van den Boom. Naast zijn werk als orthopeed bij het Elisabeth-TweeSteden Ziekenhuis (ETZ), is hij voorzitter van de Beroepsbelangencommissie (BBC) van de NOV.

De BBC behartigt de maatschappelijke- en de beroepsbelangen van de orthopedisch chirurgen. Hieronder vallen allerlei beleidszaken, adviseren over werkomstandigheden en ondersteuning bij geschillen.

Landelijk beleid

Het overhevelen van zorg naar de eerste lijn, normtijden van de zorgactiviteiten, positionering van de medisch specialist, zinnige zorg, wet en regelgeving, reduceren van de administratieve lasten en regeldruk; stuk voor stuk onderwerpen die voorbijkomen bij de BBC. "Belangenbehartiging in de brede zin van het woord", vertelt Van den Boom. Hij vervolgt: "Momenteel gebeurt er veel in het zorglandschap. Het is onze taak om mee te denken vanuit het belang van de orthopeden en thema's te agenderen bij de Federatie Medisch Specialisten (FMS). We hebben als BCC een afvaardiging in de Raad Beroepsbelangen en de werkgroepen van de FMS. De werkgroep *verdeelmodel*, de werkgroep *substitutie* en de werkgroep *positionering* bijvoorbeeld. Zo zijn we dus als orthopeden ook vertegenwoordigd in de landelijke beleidsvoering."

De zorgverzekeraars bepalen veel en zij komen met allerlei manieren om de zorg zo doelmatig mogelijk te maken. Vaak zijn dat Amerikaanse modellen. Van den Boom: "In onze ogen zijn die niet altijd goed gevalideerd en ook niet 1 op 1 te kopiëren voor het Nederlandse systeem. Het is dus lastig laveren, waarbij ziekenhuizen bij het aangaan van een zorgcontract soms het mes op de keel gezet krijgen. Via de Raad Beroepsbelangen en de werkgroepen van de FMS kunnen we echter wel invloed uitoefenen." Zo heeft de BBC in de Raad Beroepsbelangen kritiek geleverd op het voorstel van de NZa over de bekostiging en inrichting van de medisch specialistische zorg voor de komende jaren. De punten van de BBC zijn teruggegaan naar de NZa. Verder is de BBC bezig een task force op te richten om de landelijk gemaakte afspraken voor het schrappen van regels en administratieve lasten in te voeren. "De zaken die we behandelen raken heel dicht aan ons directe werk en de toekomst. Dat maakt dat het goed is dat we het als orthopeden echt zelf oppakken en niet alles overlaten aan beleidsmedewerkers."

Praktische vragen en geschillen

De BBC is er niet alleen om mee te denken over beleid. Zij krijgt ook praktische vragen van NOV-leden; onder andere over de registratie, codering of financiering van bepaalde behandelingen. En zij wordt geconsulteerd bij geschillen binnen een vakgroep, of tussen een vakgroep en de Raad van Bestuur bijvoorbeeld. Van den Boom: "Bij geschillen zien we er vooral op toe dat een procedure zuiver verloopt. We hebben geen oordeel, maar kunnen wel externe deskundigen adviseren voor mediation. Eigenlijk zijn wij bij geschillen vooral een luisterend oor en een intermediair."

Uitdaging
Van den Boom vertelt dat de BBC wat hem betreft nog wat proactiever zou kunnen zijn. "Ik zie het als een uitdaging om meer strategisch bezig te zijn en proactief in te spelen op de actualiteiten. Ook de ontwikkelingen rondom de verzekeraars zie ik als een uitdaging. Het is belangrijk dat we er gezamenlijk voor zorgen dat de kwaliteit echt bovenaan staat, dat de medisch specialist hier leidend in is en dat dit bovendien gestoeld is op adequate zorgevaluatie."Van den Boom vindt het leuk om over dit soort zaken mee te denken. "Het zit wel een beetje in mijn natuur. Ik zat destijds ook in de VOCA. Opkomen voor het gezamenlijk belang enthousiasmeert me. Ik zet me er graag voor in!"

Kent u een NOV-lid dat past in deze rubriek? Laat het ons weten via communicatie@orthopeden.org

VOCA-congres 14 september Amsterdam

De VOCA organiseert haar jaarlijkse congres op vrijdag 14 september in de Westergasfabriek in Amsterdam. De dag is bestemd voor iedereen die geïnteresseerd is in trauma en orthopedie en vooral toegespitst op A(N)IOS orthopedie en chirurgie. Het thema is *Trauma of the Upper Extremity*. De VOCA zorgt voor een afwisselend programma; presentaties afgewisseld met hands-on workshops. De programma-onderdelen zijn als volgt:

- *Proximal humeral fractures*: *reverse vs hemi prosthesis*, prof. Ekelund, Karolinska Institutet, Solna
- *Humeral nailing*, Livio Di Mascio, The Royal London Hospital, London
- *Traumatic Elbow Dislocation*, prof. Mader, Asklepios Kliniken, Hamburg
- *Examining the wrist and then fixing it*, Zulfi Rahimtoola, Royal Berkshire Hospital, Reading
- *Traumatic hand and wrist injuries*, Jeremy Field, Cheltenham General Hospital, Gloucester
- *Biology of bone healing - the diamond concept*, Nikolaos Kanakaris, Leeds Teaching Hospitals, Leeds

U kunt zich inschrijven via www.voca.org

Najaarscongres 9 en 10 oktober Rotterdam

Op dinsdag 9 oktober en woensdag 10 oktober vindt het NOV-Najaarscongres plaats in WTC Rotterdam. Op dinsdag verzorgen de werkgroepen Kinderorthopaedie en Hand & Pols parallelsessies en er is een uitgebreid wetenschappelijk programma. Aan het einde van de dag is de Algemene Ledenvergadering van de NOV. Op woensdag verzorgen de commissie Kwaliteit en CORE parallelsessies en er is een programma-onderdeel van het Concilium en van Anna Fonds I NOREF. De middag wordt ingevuld door de Werkgroep Heup, in samenwerking met de European Hip Society.

Voor uw agenda

3 juli	Prioriteringsbijeenkomst Herziening Agenda Zorgevaluatie, Utrecht
14 september	VOCA-Congres Trauma of the Upper Extremity, Amsterdam
9 en 10 oktober	NOV-Najaarscongres, Rotterdam

Meer informatie op de website van de NOV (orthopeden.org/kalender).

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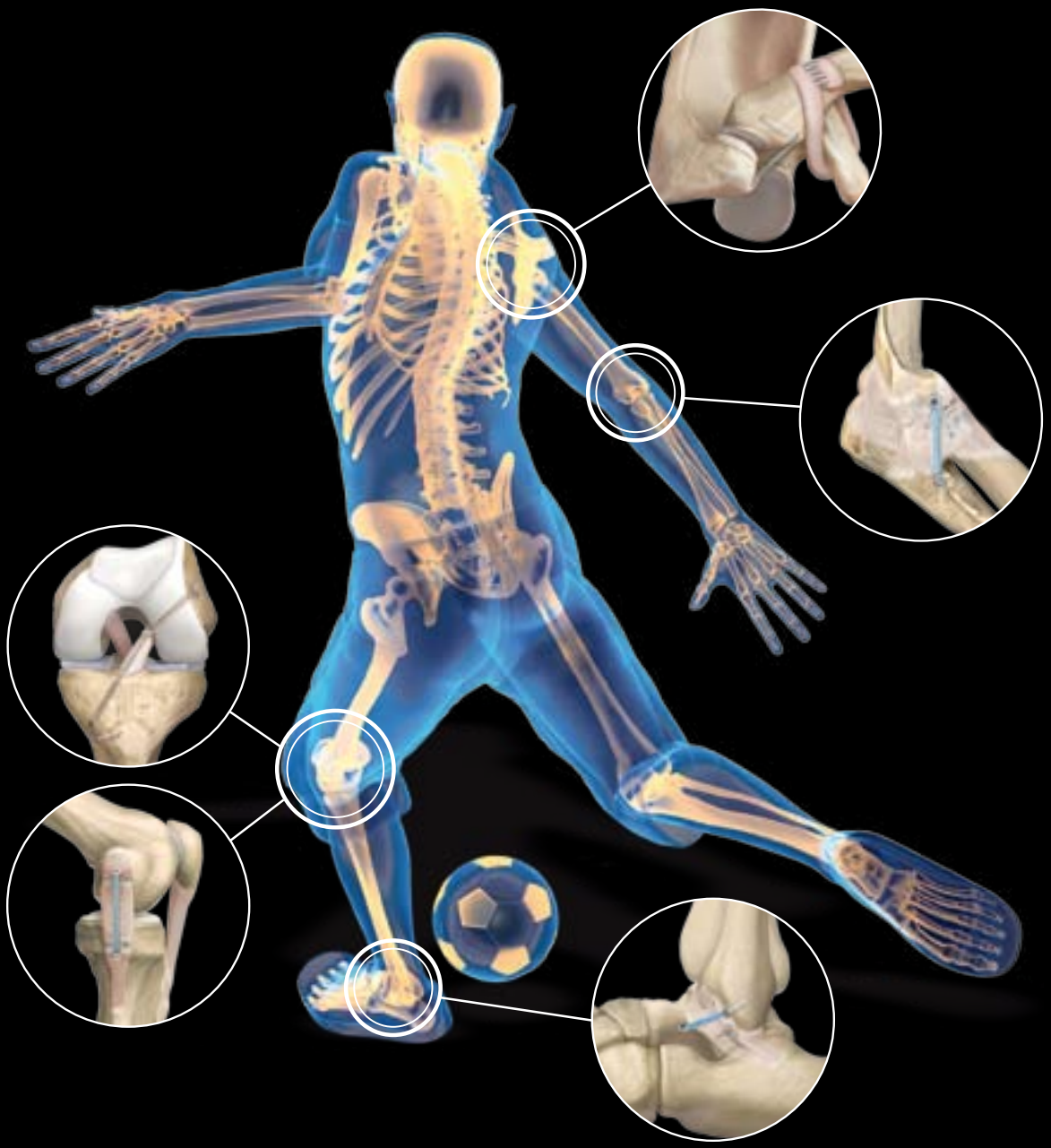

[1] Surg Technol Int. 2015 May;26:239-55.
A review of ligament augmentation with the *Internal*Brace™: the surgical principle is described for the lateral ankle ligament and ACL repair in particular, and a comprehensive review of other surgical applications and techniques is presented.
Mackay GM, Blyth MJ, Anthony I, Hopper GP, Ribbans WJ

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- 10A* ODEP and 1Nov Ratings[1]

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