

7th Annual Meeting
of the International Society
for Computer Assisted
Orthopaedic Surgery

Heidelberg, Germany
June 20-23, 2007

Conference Chairman

Paul A. Grützner, M.D.

Katharinenhospital, Stuttgart, Germany

Program Committee

Brian L. Davies, Ph.D. (Chairman)

London, Great Britain

Florian Gebhard, M.D.

Ulm, Germany

P.S. John, M.D.

Kottayam, India

Martin Krismer, M.D.

Innsbruck, Austria

Lutz-P. Nolte, Ph.D.

Bern, Switzerland

Norberto Confalonieri, M.D.

Milano, Italy

Branislav Jaramaz

Pittsburgh, USA

Leo Joskowicz, Ph.D.

Jerusalem, Israel

Frank Langlotz, Ph.D.

Zofingen, Switzerland

Michael L. Swank, M.D.

Cincinnati, USA

CME Credits*

We have applied for the approval of credits for Continuing Medical Education.

**last updated May 16, 2007.*

For Information and Registration Please Contact

CAOS 2007 Office

c/o ConCoord GmbH

Riedeggstrasse 8

3626 Hünibach

Switzerland

Fax +41 33 534 4527

Email CAOS2007@CAOS-International.org

URL <http://www.CAOS-International.org/2007/>

Wednesday, June 20, 2007

14:00 Registration

18:00 WELCOME RECEPTION AT THE INDUSTRIAL EXHIBITION

Thursday, June 21, 2007

Session I – Anatomical considerations in CAOS knees

Chairmen: Michael Nogler and Joel M. Bach

- 8:00 A CT-based analysis of the variation in the rotational reference axes of the distal femur in the non arthritic population
Rajagopal, Nathwani
- 8:10 How precise is the determination of rotational alignment of the femoral prosthesis in total knee replacement? – An in vivo study
Yau, Chiu, Tang
- 8:20 Variability of femoral component rotational landmarks during computer-assisted total knee arthroplasty
Franklin, Siliski
- 8:30 Navigation of knee revision arthroplasty using a system designed for primary surgery
Massin, Biette, Pernin
- 8:40 Relationship between cutting errors and learning curve in computer assisted total knee replacement
Manzotti, Confalonieri, Motavalli
- 8:50 Comparison of tibial rotation in fixed and mobile bearing total knee arthroplasty using computer navigation
Stiehl
- 9:00 Can robotic TKA improve the accuracy of γ and δ angles in lateral roentgenography?
Park, Lee

Session II – Soft tissue balancing in navigated knees

Chairmen: Andreas Wentzensen and Neil Glossop

- 9:10 A quantitative method of effective soft tissue management for varus knees in total knee replacement surgery using navigational techniques
Clarke, Dillon, Deakin, Kinninmonth, Picard
- 9:20 Intraoperative differences in alignment, resection height, and component sizing when measured by computer navigation vs. conventional jig based approach
Goding
- 9:30 Navigation predictors in determining the frequency of soft tissue release in TKA
Hakki, Bilotta, Hakki, Coleman
- 9:40 Quantitative flexion gap dynamics during computer navigated ligament-guided total knee arthroplasty
Heesterbeek, Keijsers, Jacobs, Verdonchot, Wymenga
- 9:50 Navigated patella tracking in TKA: influence of mediolateral positioning of the patella
van der Linden - van der Zwaag, de Bruin, Krekel, Nelissen

Break

- 10:00 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

Session III – Trauma

Chairmen: David Kahler and Radek Hart

- 10:30 Navigated reduction and fixation of acetabular fractures
Nakhla, Turner, Rodriguez, Harris, Lewis, Cobb

- 10:40 Automatic reconstruction of a surface model of the proximal femur from biplanar calibrated fluoroscopic images
Zheng, Dong, Gonzalez Ballester
- 10:50 Automatic and precise pose recovery of the distal locking holes from single calibrated fluoroscopic X-ray image for computer assisted intramedullary nailing of femoral shaft fractures
Zhang, Zheng
- 11:00 The development of robotic arm in fluoro-navigation for orthopaedic trauma surgery in the Chinese University of Hong Kong
Leung, Tang, Ng
- 11:10 Integration of computer-aided navigation and metal detector technology in the removal of shrapnel in terror attacks casualties
Peleg, Harari, Joskowicz, Liebergall, Mosheiff
- 11:20 Intraoperative 3-D imaging: Clinical consequences in 248 cases
Kendoff, Citak, Stübig, Gösling, Gardner, Hüfner, Krettek

Round Table – CAOS – Is it worth it?

Moderator: Michael L. Swank

- 11:30 Participants: N.N.

Presidential Guest Lecture I

- 12:20 Host Zuse
The origins of the computer

Break

- 12:50 LUNCH BREAK AT THE INDUSTRIAL EXHIBITION

Poster Session, Part 1

- 10:30 POSTERS S1-S12 WERE RATED “SPECIAL POSTERS” INDICATING AN EXCEPTIONAL QUALITY OF THIS WORK. ALL POSTERS ARE ON DISPLAY FOR THE ENTIRE TIME OF THE MEETING. POSTER AUTHORS WILL BE AVAILABLE AT THEIR POSTERS FOR QUESTIONS DURING THE POSTER SESSION IN WHICH THEIR POSTERS ARE LISTED.
- S1) Limb alignment correction using traditional and computer assisted Taylor spatial frame
Slagel, Ellis, Ma, Simpson, St. John, Borschneck
- S2) Does a navigation system for ACL replacement realistically predict the length change of tendon grafts?
Dürselen, Weisser, Marin, Seitz, Kowal, Wentzensen, Claes, von Recum
- S3) Navigation assisted open wedge high tibial osteotomy – How to prevent unintended increase of posterior slope of proximal tibia
Song, Seon, Park, Cho
- S4) CAS for shoulder arthroplasty – Short term results
Hassan, Pascal
- S5) Navigation in hip resurfacing: Report of initial results
Swank, Korbee
- S6) A real-time automatic ultrasound calibration system with accuracy control for computer assisted orthopaedic surgery
Chen, Thurston, Ellis, Abolmaesumi
- S7) Endoscope as a 3D tracker
Thoranaghatte, Nolte, Zheng
- S8) A scaled pelvic frame of reference for hip surgery
Dandachli, Richards, Nakhla, Cobb

Special Posters

- S9) Accuracy of ultrasound-to-MR registration of the knee
Murtha, Watterson, Nikou, Jaramaz
- S10) Volumetric meshes based on medial representation for medical applications
Assassi, Guillard, Gilles, Magnenat-Thalmann
- S11) Development of a real-time motion analysis system for patients after total hip arthroplasty
Otake, Suzuki, Hattori, Hidenobu, Yamamura, Yonenobu, Ochi, Sugano
- S12) In vivo measurement of dynamic motion patterns of the wrist
Carelsen, Jonges, Strackee, van Kemenade, van Herk, Streekstra
- 1) Preliminary results of a prospective randomized study – Fixed vs. mobile bearing computer assisted total knee arthroplasty
Dries, Sufi-Siavach, Lemke, Bohlen, Hille, Lampe
- 2) Evaluation of rotating platform total knee prosthesis by means of KinNav navigation system
Martelli, Zaffagnini, Iacono, Bignozzi, Lopomo, Casino, Marcacci
- 3) Alignment of total knee arthroplasty: A comparison of mechanical and computer assisted TKA surgery
Wegner, Cook, Feinglass, Stulberg
- 4) What is the benefit of navigation in TKA for posttraumatic arthrosis?
Mägerlein, Unger, Schulz, Inden, Fuchs
- 5) Better alignment and high reliability with CAS in total knee surgery – A prospective randomized study
Wiersma- Tuinstra, Driessen, Bruijn
- 6) Quality of implant alignment and results in minimally invasive navigated total knee arthroplasty
Bohlen, Dries, Sufi-Siavach, Hille, Lampe
- 7) Clinical results of navigated MIS quadriceps-sparing total knee arthroplasty
Huang
- 8) Comparison of mechanical axis measurements: Intraoperative navigation versus postoperative standing films
Smail, Swank, Korbee
- 9) Use of computer navigation to measure flexion and extension gaps and ligament tension in the cadaveric knee
Wernecke, Plaskos, Anderson, Mayman, Sculco
- 10) Three dimensional preoperative planning software Athena navigates MIS-TKA
Tatsumi, Hirakawa, Nakasone, Takayanagi
- 11) 8 to 10 years of follow-up for 26 computer assisted TKA
Ssragaglia, Picard, Leitner
- 12) Development of three-dimensional evaluation system for patello-femoral alignment
Kobayashi, Wakisaka, Kaneko, Oohashi, Nemoto
- 13) Accuracy and precision in navigated total knee replacement: A pilot study in a treatment center
Dandachli, Dassanayake, Tariq, Silvester, Strachan, Nathwani
- 14) Sagittal plane alignment of the femoral component in TKA – CAOS vs. manual
Song, Seon, Park, Cho, Yoon
- 15) A new 2.5D ultrasound system integrated in the OrthoPilot navigation system
Keppler, Bartl, Kozak, Kraus, Gebhard
- 16) Computer-assisted TKA for severe genu varum deformities – Results for 31 prostheses
Saragaglia, Rubens-Duval, Chaussard
- 17) Alignment of total knee arthroplasty: Implications for computer assisted TKA surgery
Wegner, Cook, Feinglass, Stulberg
- 18) Navigational total knee arthroplasty for knee arthritis associated with extra-articular deformities
Hafez, Keast-Butler, Angelini, Schemitsch
- 19) What is a “normal” knee laxity?
Jenny, Boeri, Ciobanu

- 20) Accuracy and benefit from minimal invasive computer-assisted total knee arthroplasty
Biasca
- 21) Morbidity related to rigid osseous fixation of the reference bodies for kinematics based registration in computer assisted knee arthroplasty
Bhattacharyya, Gerber
- 22) Measuring alignment of Japanese OA knee with OrthoPilot
Kanesaki, Hieda, Nagata
- 23) 3D freehand ultrasound-based bone modeling for total knee replacement
Bovio, De Momi, Forlani, Cerveri, Ferrigno, Audrito, Facchini, Dellaca
- 24) Kinematics and ligamentous stability of passive knees measured pre and post surgical intervention by a novel navigation system
Nadzadi, Ecker, Murphy
- 25) Restoration of the joint line in computer navigated total knee arthroplasty
Biasca, Catani
- 26) Leg length change due to total knee arthroplasty
Nadzadi, Ecker, Lang, Murphy
- 27) Navigation improves accuracy and reproducibility of soft tissue balance in TKA
Stulberg, Yaffe, Koo
- 28) Lateral milling of bone for total knee arthroplasty using an impedance force controlled hybrid Cartesian knee surgical robot
Yen, Lai
- 29) Soft-tissue balancing with virtual bone cuts in navigated total knee arthroplasty
Potel, Boussaton, Javois, Essig
- 30) Kinematic versus fluoroscopic navigation in knee arthroplasty
Hagena, Röser
- 31) The mathematical relationship between varus deformity and tourniquet time for computer assisted total knee replacements
Sampath, Voon, Woodhouse`, Bolton, Cosgrove, Sangster, Davies
- 32) Quality of life after computer assisted total knee arthroplasty using the OrthoPilot system
Peterlein, Fuchs-Winkelmann, Scherf
- 33) Navigated femoral nailing including non-invasive registration of the contralateral intact femur – First clinical applications
Kendoff, Citak, Gösling, Stübig, Krettek, Hüfner
- 34) Evaluation of the second generation of computer assisted orthopedic fracture reduction
Khoury, Mosheiff, Beyth, Joskowicz, Finkelstein, Liebergall
- 35) Defining safety margin for percutaneous sacral-iliac screw and acetabular column screws insertion with high resolution CT and 3D navigation surgical planner
Ning, Shing, Kin, Sui
- 36) Semiautomatic robotic reduction of femoral shaft fractures with 3D visualization
Oszwald, Westphal, Bredow, Goesling, Kendoff, Hüfner, Wahl, Krettek
- 37) Rotational control by fluoroscopic CAS of diaphyseal fractures of the lower limbs
Castelli, Barbieri, Gotti, Pelis, Argnani
- 38) Electromagnetic tracking for navigation in computer assisted distal locking for intramedullary nailing of the femur: A feasibility study
Beadon, Stanley, Guy, O'Brien, Hodgson
- 39) Intraoperative 3D navigation in orthopaedic trauma surgery
Ning, Shing, Kin, Sui
- 40) New imaging protocol for fluoro-navigation surgery in pelvi-acetabular fractures
Leung, Wang, Ng, Tang
- 41) Navigated scaphoid screw insertion
Hüfner, Kendoff, Gaulke, Citak, Krettek, Citak

Total Knee Replacement

Trauma

- 42) Computer navigation allows for accurate reduction of femoral fractures
Weil, Gardner, Helfet, Pearle
- 43) Fluoroscopy based computer assistance used for reduction and internal fixation of long bone fractures
Hart, Kozák, de Cordeiro, Filan
- 44) Improved therapy of os calcis fractures by intraoperative recognition of incongruity using 3D fluoroscopy
Unger, Schulz, Simon, Paech, Queitsch
- 45) Case reports of robot assisted intertrochanteric fracture reduction
Maeda, Sugano, Saito, Yonenobu, Nakajima, Warisawa, Mitsuishi
- 46) Automated fracture table for reduction of long bone fractures in the lower limb
Hung, Lee, Yang, Fang
- 47) Fluoro-navigation surgery in orthopaedic trauma – A summary of clinical results and critical review
Leung
- 48) Trauma surgery of the extremities: The difference between what the surgeon thinks and intraoperative 3D-RX shows
Haverlag, Carelsen, Luitse, van Kemenade, Streekstra, Goslings
- 49) 3D visualized robotic reductions of intertrochanteric fractures
Goesling, Oszwald, Westphal, Kuepper, Hüfner, Kendoff, Wahl, Chrettek
- 50) A solution for 3D jigsaw puzzle of fractured bones: Feasibility and preliminary experiments
Moghari, Abolmaesumi
- 51) For percutaneous screws fixation of fractures of acetabular columns using navigation system: A cadaver model
Wang, Wu, Tang, Zhao, Su, Wang, Leung
- 52) A comparison of image quality between Siemens Iso-C^{3D} and Ziehm Vario 3D imaging systems
Stübig, Kendoff, Khalafi, Citak, Krettek, Hüfner
- 53) Computer aided patient specific quantitative preoperative planning in a clinical environment:
Peleg, Mosheiff, Joskowicz, Gefen, Liebergall
- 54) CT (Iso-C^{3D}) image based computer assisted navigation in trauma surgery: A preliminary report
Atesok, Finkelstein, Khoury, Liebergall, Mosheiff
- 55) Intraoperative 3D imaging using an isocentric mobile C-arm with flatpanel detector
Heining, Riquarts, Schmidgunst, Euler, Mutschler
- 56) Higher precision using a navigated mechanical aiming device for SI screw placement – An experimental analysis
Geerling, Meisenburg, Citak, Kendoff, Stübig, Krettek, Hüfner
- 57) Hand surgery with intraoperative 3D-RX imaging
Strackee, Carelsen, van Kemenade, Streekstra
- 58) Reliability and reproducibility of a simplified leg length measurement algorithm in total hip arthroplasty
Murphy, Ecker, Tuma, Haimerl
- 59) Robo-Navi-MIS-THA
Sugano, Nakamura, Yamamura, Iwana, Kakimoto, Nishii, Hananouchi, Sakai
- 60) The Imperial hip protocol: An optimized very low dose ct protocol for planning and measuring outcome
Henckel, Richards, Lozhkin, Rodriguez y Baena, Davies, Cobb
- 61) Navigated control of the cup orientation during total hip replacement
Jenny, Dosch, Boeri, Uscatu
- 62) Acetabular component positioning in minimally invasive total hip arthroplasty: Comparison of conventional and image-free computer assisted assessment
Stiehl, Heck

Trauma

Total Hip Replacement

- 63) The use of computerized range of motion simulations to demonstrate the need for improved accuracy in acetabular cup placement in total hip arthroplasty
Thornberry, Nelson
- 64) Use of transverse acetabular ligament for acetabular cup placement in computer assisted total hip replacement
Swank, Alkire, Korbee, Jon
- 65) Differential accuracy of various image-based methods in computer assisted surgery for cup placement in supine two-incision total hip arthroplasty
Dayton, Mejia, Baldini, Peacher, Williams, Bach
- 66) Combination of CT-based navigation and ROBODOC in primary cementless total hip arthroplasty: Effect of limb-length equalization
Nakamura, Sugano, Nishii, Hananouchi, Yoshikawa, Kakimoto, Yamamura, Iwana
- 67) A fast method for finding maximum range of motion in the hip joint
Arbabi, Boulic, Thalmann
- 68) Novel method for intra-operative computation of the femoral neck anteversion angle
De Momi, Cerveri, Gambaretto, Audrito, Facchini, Ferrigno
- 69) 3D evaluation of the acetabular coverage assessed by biplanar X-rays compared with CT-scan
Humbert, Carlouz, Baudoin, Skalli, Mitton
- 70) Fluoro-based navigation system significantly improved cup orientation in total hip arthroplasty
Ikebuchi, Iwaki, Tokuhara, Iwakiri, Oota, Minoda, Takaoka
- 71) The evolution of the interface of the uncemented femoral stem – A CT based analysis
Cobb, Kannan, Richards, Nakhla
- 72) Treatment of massive acetabular defects with excessive bone loss: From automated computer based reconstruction proposal to biomechanically justified defect-filling triflange cup implant
Gelaude, Broos, Mulier, Vandenbroucke, Kruth, Lauwers, Vander Sloten
- 73) Which plan of reference for PTH navigation?
Judet
- 74) Assessing THR outcomes using 3D/3D registrations
Eckman, Davidson, Archbold, Slomczykowski, Beverland, Jaramaz
- 75) Bay Pines experience with the first 50 navigated Excite hips
Hakki, Bilotta, Zilioli, Hakki

Educational Workshops

- 15:20 COFFEE BREAK
- Workshop 1
Sponsored by BrainLAB
- Workshop 2
Sponsored by Biomet
- Workshop 3
Sponsored by DePuy
- Workshop 4
Sponsored by BrainLAB
- Workshop 5
Sponsored by Biomet
- Workshop 6
Sponsored by Plus Orthopedics
- 18:30 END OF DAY 1

Friday, June 22, 2007

Session IV – Total Hip Replacement

Chairmen: André Bauer and Willi Kalender

- 8:00 Why perform total hip arthroplasty using surgical navigation?
Murphy, Ecker, Tannast
- 8:10 Ultrasound based versus pointer palpation method in THA Navigation – A comparative pilot study
Kiefer
- 8:20 Anatomical landmarks used for patient specific cup placement: Concept validation using contrast-enhanced MRI imaging
Slomczykowski, Archbold, Crone, Eckman, Jaramaz, Beverland
- 8:30 The experience of new CT based fluoroscopy matching hip navigation system
Yanagimoto, Kaneko, Fujita, Funayama, Nishiwaki, Hotta, Toyama
- 8:40 The clinical precision of acetabular cup position after CT based navigation assisted THA using VectorVision Hip for Japanese patients
Tokunaga, Miyasaka, Takano, Endo
- 8:50 Computer assisted total hip replacement with modular neck component
Merloz, Eid, Dumas, Rossi
- 9:00 Comparison of a mini-posterior approach and a direct anterior approach on the accuracy of cup orientation using a CT-based navigation system
Hananouchi, Sugano, Nishii, Sakai, Iwana, Miki

Session V – Aspects of Hip Joint Treatment

Chairmen: Martin Krismer and Manuela Kunz

- 9:10 Arthroscopic percutaneous computer assisted FAI relief using a new method of CT-fluoro registration
Murphy, Ecker, Tuma, Haimerl
- 9:20 Computer assisted correction of radiographic parameters on pelvic X-rays with Hip²Norm: Reliable and validated
Tannast, Mistry, Steppacher, Zheng, Langlotz, Siebenrock
- 9:30 Navigation for arthroscopic correction of the femoral offset – Improvement or impediment?
Stahelin, Haimerl, Stahelin, Herzog
- 9:40 Patient-specific variability and accuracy of hip abduction/anteversion angular measurements
Lubovsky, Khoury, Peleg, Joskowicz, Liebergall
- 9:50 Obtaining the functional pelvic flexion using 2.5D echography
Dardenne, Dusseau, Stindel, Hamitouche, Lefevre, Roux

Break

- 10:00 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

Session VI – Imaging, Tracking, and Robotics

Chairmen: Kwok-Sui Leung and Moshe Shoham

- 10:30 A method for evaluating the accuracy and sensitivity of electro-magnetic tracking
Göggelmann, Schwering

- 10:40 A comparative analysis of the torque stability of reference marker systems in computer aided orthopaedic surgery
Citak, Board, Kendoff, Sun, Krettek, Hüfner
- 10:50 A new technique for 3D anatomically based patella tracking in navigated total knee replacement
Belvedere, Leardini, Catani, De Deo, Giannini
- 11:00 Path planning with collision avoidance for 5-DOF robotic removal of femoral bone cement in RTHR
Serefoglou, de la Fuente, Radermacher
- 11:10 Free isocentric imaging and intraoperative tomographic reconstruction with a standard C-arm
Tita, Lueth

Session VII – Registration

Chairmen: Frédéric Picard and Miguel A. Gonzalez

- 11:20 A rapid registration technique improves repeatability of guide-pin positioning in femoral head resurfacing arthroplasty
Hodgson, Helmy, Masri, Greidanus, Inkpen, Duncan, Garbuz, Anglin
- 11:30 A bounded registration method for minimally invasive registration of the femur
Rodriguez y Baena, Barrett, Harris, Henckel, Jakopiec, Gomes, Cobb, Davies
- 11:40 Kalman filtering for ultrasound based rigid registration in CAOS
Talib, Peterhans, García, Styner, González Ballester
- 11:50 Registration of intraoperative 3D ultrasound with preoperative MRI data for navigated surgery – First results at the knee
Dekomien, Hold, Hensel, Schmitz, Winter

Presidential Guest Lecture II

- 12:00 Siegfried Russwurm
Impact of IT on modern healthcare delivery

Break

- 12:30 LUNCH BREAK AND GENERAL ASSEMBLY OF CAOS-INTERNATIONAL

Session VIII – Clinical Outcomes of Navigated Knees

Chairmen: Kamal Deep and Sandra Martelli

- 14:00 Computer assisted TKA versus the Conventional Technique: Results of 1000 cases
Bäthis, Tingart, Lüring, Beckmann, Grifka, Perlick
- 14:10 Computer navigation in TKR: A comparison of CT based, CT free and conventional surgery using alignment, clinical outcome, and RSA
van Strien, van der Linden, Valstar, Nelissen
- 14:20 Two-year follow up on joint function and patients satisfaction comparing computer assisted vs. freehand TKR
Lüring, Perlick, Bäthis, Oczipka, Grifka
- 14:30 Minimally invasive computer assisted TKA through mini subvastus and mini midvastus approaches
Zanasi
- 14:40 Computer assisted, minimally invasive versus conventional knee arthroplasty: A prospective, randomized study
Ng, Dutton, Yeo, Chia, Chong
- 14:50 Implant alignment and quality of life following computer assisted total knee arthroplasty: A prospective comparative randomized multicenter study
Roy, Poulin, Amiot

- 15:00 5-year results after using the robot system "CASPAR" for total knee arthroplasty
Mai, Ahmadian, Lörke, Siebert

Poster Session, Part 2

- 10:30 COFFEE BREAK AND POSTER PRESENTATIONS
POSTERS S13-S24 WERE RATED "SPECIAL POSTERS" INDICATING AN EXCEPTIONAL QUALITY OF THIS WORK.
ALL POSTERS ARE ON DISPLAY FOR THE ENTIRE TIME OF THE MEETING. POSTER AUTHORS WILL BE AVAILABLE
AT THEIR POSTERS FOR QUESTIONS DURING THE POSTER SESSION IN WHICH THEIR POSTERS ARE LISTED
- S13) Clustering of deformation modes for quantitative evaluation of statistical shape models
Reyes, Gonzalez Ballester
- S14) Fluoroscopy based 3D kinematic analysis of the spine based on a priori knowledge and motion constraints
Thistlethwaite, Ferguson
- S15) Improving functional orientation measurements using 2D/3D registration
Eckman, Davidson, Slomczykowski, Beverland, Jaramaz
- S16) Image based RSA: Roentgen stereophotogrammetric analysis based on 2D/3D image registration
de Bruin, Kaptein, Rozing, Valstar
- S17) Evaluation of noninvasive referencing for navigated ultrasound registration in pre-, intra-, and postoperative procedures
Kozak, Mairaj, Krupakaran, Keppler
- S18) Error evaluation of an electro-magnetic tracking system
Elfring, Klein, Radermacher
- S19) Accuracy and reliability of limb alignment control using surgical navigation during total knee arthroplasty
Murphy, Ecker
- S20) Comparison of optical and electromagnetic tracking protocols in total knee arthroplasty
Stiehl
- S21) Blood loss following total knee arthroplasty is reduced when using computer assisted versus standard methods
McConnell, Dillon, Kinninmonth, Sarungi, Picard
- S22) Assessment of dynamic total knee arthroplasty function by two different surgical techniques (computer assisted and traditional instrumentation) using gait analysis
Dillon, Cclarke, Nnicol, Picard, Gregori, Kinninmonth
- S23) Navigated patella tracking in TKA: Influence of rotation of the femoral component
van der Linden - van der Zwaag, de Bruin, Nelissen
- S24) A new technique for 3D anatomical-based assessments on knee soft tissue orientation and lengthening in navigated total knee arthroplasty
Belvedere, Leardini, Catani, Ensini, Giannini
- 76) Surveillance strategy following total hip arthroplasty: A CAOS based protocol
Kannan, Richards, Cobb
- 77) Determination of polyethylene wear in total hip arthroplasties with use of OCULA-GAWDI
Ikebuchi, Nakajima, Tatsumi, Ikawa, Iwakiri, Minoda, Iwaki, Takaoka
- 78) Computer assisted core decompression of early hip osteonecrosis by using fusion images from Iso-C^{3D} fluoroscopy and preoperative MRI and navigated endoscopic analysis of bone core tract
Wong, Kumta, Griffith, Leung, Ng, Lee, Cheung
- 79) Etiology of osteoarthritis of the hip joint – Pathomorphologic findings and prearthrotic deformities
Ecker, Tannast, Puls, Siebenrock, Murphy
- 80) Assessment of joint contact areas using a CT based distance criterion: Cross-validation with a cadaver study
Bartels, Bertrand, Gelaude, Moens, Fabry, Van der Perre, Vander Sloten

Special Posters

THR

Aspects of Hip Treatment

- 81) CO₂ laser system for osteotomy
Werner, Ivanenko, Steigerwald, Klasing, Harbecke, Wagner, Hering
- 82) Video tracking based navigation system for ACL reconstruction
Sun, Hu, Liu, Wang, Hu, Feng, Wang, Wang
- 83) Non-photorealistic rendering of virtual implant models for computer assisted fluoroscopy based surgical procedures
Zheng, Nolte
- 84) Development and evaluation of a new HCI-device for CAOS
Kanert, Ibach, Radermacher
- 85) Statistical finite element analysis for bone and implant modeling
Belenguier Querol, Büchler, Reimers, Rueckert, Nolte, González Ballester
- 86) Development of a pelvic coordinate system for use with surgical navigation
Lewandowski, Bach
- 87) In vivo measurement of knee joint forces – A review of criteria and techniques
Schmidt, Mumme, Radermacher
- 88) Computer assisted manipulator and motor controlled device for microsurgery
Gotani
- 89) Distal radius and K-wire localization in 3D ultrasound using local phase information
Hacihaliloglu, Abugharbieh, Hodgson, Rohling, OBrien, Guy
- 90) Automatic X-ray to anatomy registration: Proof of concept, sensitivity analysis, and validation/verification results
Slomczykowski, Nofrini
- 91) Ultrasounds registration of the anterior pelvic plane (APP): Comparison with X-ray and OrthoPilot palpation measurements
Mainard, Valentin, Galois, Gasnier, Mollard
- 92) Comparison of the accuracy of sonography based pelvis' bone landmark determination
Overhoff, Sandkühler, Schwägli
- 93) Workspace-to-volume ratio of novel robot kinematics for orthopaedic interventions on bone
Pott, Schwarz
- 94) Incremental ultrasound registration
Watterson, Murtha, Nikou, Jaramaz
- 95) Evaluation of the draft ASTM CAOS standard
Bach, Barrera, Kazanzides, Haider
- 96) A registration uncertainty visualization method
Simpson, Ma, Chen, Ellis, Stewart
- 97) Design concept evaluation of a modular and flexible mini-robot for orthopaedic surgery
Niggemeyer, Schröder, Radermacher
- 98) Segmentation of blood vessels in 3D ultrasound datasets by a model based region growing algorithm
Hold, Hensel, Winter, Dekomien, Schmitz
- 99) Navigation with fused preoperative CT/MRI and intraoperative 3D fluoroscopy – Introduction to a new navigation technique and the clinical applications
Ning, Shing, Kin, Sui
- 100) Ultra-fast dynamic surface imaging using holographic topometry
Hirsch, Thelen, Gisbert, Heintz, Schwenzer-Zimmerer, Hering
- 101) Mechanical weight bearing simulation – Influence on navigated lower limb axis measurements
Kendoff, Board, Citak, Ostermeier, Hankemeier, Gardner, Krettek
- 102) Industrial standards in surgical robotics
Schröder, de la Fuente Klein, Niggemeyer, Radermacher

- 103) First clinical experiences with a new advanced tracking device in navigated total knee and total hip replacement
Mattes, Ostertag, Decking, Reichel
- 104) Progressive usability assessment for the development of complex OR components
Lauer, Janss, Radermacher
- 105) Electromagnetic vs. infrared surgical navigation systems for TKA: Comparison of accuracy bench study
Lionberger, Conditt, Stevens, Noble
- 106) Approach towards transparent network communication for tracking systems
Ibach, Kanert, Radermacher
- 107) Experiments on bone drilling control with a robot arm for computer integrated surgery
Fraile, Perez-Turiel, Gonzalez-Sanchez, Lopez-Cruzado, Rodriguez
- 108) Inter- and intra-surgeon variability in defining anatomical reference frames in navigated total knee surgery
Belvedere, Leardini, Catani, Bianchi, Giannini
- 109) MERODA – The medical robotics database
Pott, Döbel, Schoppmann, Schwarz
- 110) Graphical interface for virtual surgery planning
SwiatekNajwer, Krowicki, Keppler, Kozak, Kryzstoforski
- 111) In vivo cartilage thickness measurement by computer assisted 3D MRI models of the knee
Park
- 112) Soft tissue imaging using a mobile CBCT scanner with a flat panel detector
Heiland, Blessmann, Blake, Schmelzle, Pohlenz
- 113) The development of a surgeon directed user interaction for CAS
Bartelme, Burger, Mathys, Voelkel
- 114) Bone reconstruction based on sonography and data acquired from tracking system
Krowicki, Swiatek-Najwer, Keppler, Kozak, Kryzstoforski
- 115) In vitro evaluation of freehand navigated bone cement removal using a mechanical supporting device
de la Fuente, Niggemeyer, Mumme, Rode, Radermacher
- 116) The use of a head mounted, monocular monitor during orthopaedic intraoperative, fluoroscopy examination
Ortega, Wolff, Baumgaertner, Starr, Kendoff
- 117) Multimodal graphical interface for total knee and hip arthroplasty
Cerveri, Gambaretto, De Momi, Ferrigno
- 118) Study of the cadaver knee axial rotation using a dedicated navigation system
Massin, Kilian, Biette, Pernin, Schmes
- 119) Navigation reduces the learning curve in hip resurfacing
Kannan, Brust, Thevendran, Cobb
- 120) Reporting accuracy in hip resurfacing: A 3D CT based method
Henckel, Richards, Rodriguez y Baena, Kannan, Cobb
- 121) Do different surgical approaches influence the precision of image-free and CT guided computer assisted hip resurfacing systems?
Kunz, Ma, Huang, Rudan, Ellis
- 122) First experience in computer assisted articular surface replacement of the hip with Ci-software (DePuy ASR system)
Koot, Biezen, Leeuwen, Dekkers, Reijman, Vissers, Verhaar
- 123) MIS unicompartmental knee arthroplasty and kinematic navigation
Pink, Janecek, Pink, Stoklas

Technical Aspects of CAOS

Total Hip Resurfacing

Uni-Knee

- 124) Skin marker based referencing for spinal dorsal interventions – A feasibility study
Ebert, Wendl, Grützner, Nolte, Kowal
- 125) 5-year experience with navigation in intraoperative 3D datasets in orthopedic surgery
Wendl, von Recum, Wentzensen, Grützner
- 126) Minimally invasive spine surgery using the X-tube and SEXTANT system with Iso-C navigation
Sato, Ando, Inoh, Nakashima
- 127) Iso-C-based navigated placement of dens screws – Experimental analysis of drilling precision
Geerling, Frenzel, Kendoff, Citak, Partenheimer, Krettek, Hüfner
- 128) Clinical accuracy of pedicle screw insertion with the Stryker CT based navigation system using cableless active LED markers
Laine, Lohman, Lund, Lohikoski, Österman, Schlenzka
- 129) Evaluation of an optimization module for single and double cut oblique osteotomy based correction of deformed long bone
Belei, Schkommodau, Frenkel, Mumme, Radermacher
- 130) PET-CT for navigation in cases of chronic osteitis? An experimental investigation
Militz, Linke, Uhde, Christian
- 131) Monitoring of the upper part of the tibia during navigated HTO is of high interest
Stindel, Cotonea, Dubrana, Lefevre
- 132) Assessment of distal radius osteotomy plans using digitally reconstructed radiographs
Ma, Athiviraham, Huang, Slagel, Luenam, Pichora
- 133) IKDC categorical scores vs. navigation based evaluations
Murtha, Steckel, Moody, Costic, Davidson, Burns, Fu, Jaramaz
- 134) The influence of lateral plasty in single bundle hamstring technique – An in vivo study
Bignozzi, Zaffagnini, Lopomo, Iacono, Martelli, Lo Presti, Marcacci
- 135) Quality control and CAOS stress radiography in anterior cruciate ligament reconstruction
Klos, Banks
- 136) High tibial osteotomy by CAS: Method's presentation, results, and critical evaluation
Castelli, Cobelli, Barbieri, Gotti
- 137) Imageless navigated high tibial osteotomy in closing-wedge technique treating knees with varus gonarthrosis
Baur
- 138) Limb rotation in navigated alignment analysis: Implications for high tibial osteotomies
Kendoff, Citak, Pearle, Gardner, Hankemeier, Krettek, Hüfner
- 139) Tumor resection within the pelvis: Accuracy study of the conventional surgical technique
Cartiaux, Docquier, Paul, Banse, Delloye, Cornu, Raucent
- 140) Comparison of navigated ACL graft isometry and obliquity in native ACL vs. ACL reconstructions
Pearle, Shannon, Granchi, Moreau-Gaudry, Warren
- 141) Computer navigated ACL graft obliquity and isometry
Pearle, Shannon, Granchi, Moreau-Gaudry, Warren, Wickiewicz
- 142) Musculoskeletal tumor surgical planning and simulation in a stereoscopic three-dimensional virtual reality environment
Wong, Kumta, Antonio, Griffith, Leung
- 143) ACL-reconstruction: The influence of computer assisted surgery on kinematics – A cadaver study
von Recum, Weissner, Seitz, Marin, Kowal, Claes, Wentzensen, Dürselen
- 144) Arthroscopy assisted computer aided medial open wedge high tibial osteotomy for varus knee deformity
Lo, Cheung, Yung, Chiu
- 145) Range of motion simulation for shoulder arthroplasty
Krekel, Botha, Post, Valstar, de Bruin, Rozing
- 146) Applying 3D ultrasound for planning the navigated implantation of shoulder endoprostheses
von Jan, Sandkühler, Rühmann, Overhoff

Spine

Reconstructive Procedures

Shoulder

- 147) 4D visualization of the musculoskeletal system demonstrated for human upper arm musculature
Kober, Gallo, Helwig, Sader, Zeilhofer
- 148) Bony landmark registration for computer navigation of the shoulder: Evaluation of accuracy
de Bruin, Krekel, Rozing, Valstar
- 149) Validation of Intra-operative registration for computer-assisted shoulder arthroscopy:
Preliminary cadaver experiments
Beek, Abolmaesumi, Tyryshkin, Huang, Mousavi, Pichora

Shoulder

Session IX – Total Hip Resurfacing

Chairmen: Mahmoud Hafez and Wafa Skalli

- 16:40 Computer assisted femoral component placement in resurfacing arthroplasty
Hart, Šváb, Filan, deCordeiro
- 16:50 Multicenter evaluation of Recap KS implantation device and its validation using the computer aided navigation
Singhal, Phadnis, Whitwell, Delport
- 17:00 Computer aided hip resurfacing using rapid prototyping
Kunz, Rudan, Ellis
- 17:10 Computer assisted hip resurfacing arthroplasty: Early clinical results of a two arm navigation system
Cobb, Kannan, Thevendran
- 17:20 Computer assisted hip resurfacing surgery using the Acrobot[®] navigation system
Barrett, Davies, Harris, Henckel, Jakopc, Kannan, Rodriguez y Baena, Cobb

CAOS-International Banquet

- 18:15 Walk to the cable-car station, transfer to Heidelberg Castle
Presentation of the Maurice E. Müller Award for Excellence in Computer Assisted Surgery
Introduction of the new CAOS-International President
Invitation to the 8th Annual Meeting of CAOS-International in Hong Kong
- 23:00 END OF DAY 2

Saturday, June 23, 2007

Session X – Unicompartmental Knees

Chairmen: Fabio Catani and Stéphane Lavallée

- 8:00 Computer assisted FluoroGuide surgical navigation – A prospective radiographic review with the minimally invasive Oxford unicompartmental knee arthroplasty
Rudan, Chakraverty, Ma, Watson, Grant
- 8:10 Comparison of minimally invasive unicondylar knee arthroplasty with or without a navigation system
Song, Seon, Park, Cho, Yoon
- 8:20 MIS & CAS in knee replacement: Bi-unicompartmental (bi-UKR) vs. total knee (TKR) – A matched pairs study
Confalonieri, Manzotti, Motavalli
- 8:30 Application of Kin-Nav system for in vivo kinematic evaluations during unicompartmental knee reconstruction
Martelli, Zaffagnini, Iacono, Bignozzi, Lopomo, Casino, Marcacci
- 8:40 Accuracy provides enduring functional improvement in arthroplasty: 18 months results of robotic assisted unicompartmental knee replacement
Cobb, Henckel, Brust, Rodriguez-y-Baena, Harris, Jacopec, Barret, Davies

Session XI – Spine

Chairmen: Dietrich Schlenzka and Lutz Claes

- 8:50 Finite element simulation as a help for lumbar spine surgery planning
Mosnier, Lafage, Skalli
- 9:00 Accuracy of intraoperative isocentric C-arm 3D fluoroscopy for sextant percutaneous pedicle screw placement
Nakashima, Satou, Ando, Inoh
- 9:10 Intraoperative CT with integrated navigation system
Scheder, Morhard, Heigl, Uhl, Tonn, Zausinger
- 9:20 Navigated kyphoplasty in osteoporotic vertebral fractures
Oberst, Izadpanah, Konrad, Doser, Südkamp
- 9:30 Experimental flow characterization of PMMA bone cement in an artificial vertebra model
Löffel, Kowal, Nolte
- 9:40 SpineAssist® in the placement of lumbar pedicle screws
Schmieder, Pechlivanis, Engelhardt, Kiriyanthan, Harders
- 9:50 Fiducial-free endoscopic vertebra referencing
Wengert, Cattin, Baur, Duff, Székely

Break

- 10:00 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

Session XII – Reconstructive Procedures

Chairmen: Philippe Merloz and Markus Schwarz

- 10:30 Atlas based semi-automatic segmentation of MRI data
Jaramaz, Watterson, Murtha, Mor, Nikou

- 10:40 Better tunnel isometry in computer assisted navigated ACL reconstruction (OrthoPilot) compared to traditional instruments. A cadaver study on 36 paired knees
Angelini, Albuquerque, Hernandez, Camanho
- 10:50 Measuring the positioning of an ACL replacement with a navigation system – X-ray and CT measurements
Jenny, Ciobanu, Boeri
- 11:00 Computer assisted surgery in musculoskeletal bone tumor using CT based navigation spine system
Wong, Kumta, Leung, Unwin, Cheung, Ng, Lee
- 11:10 A new method for bone allograft selection
Paul, Docquier, Cartiaux, Lecouvet, Cornu, Delloye, Banse
- 11:20 A biomechanical feedback system for periacetabular osteotomy: Experience after 10 clinical cases and ongoing developments
Armiger, Armand, Lepistö, Tallroth, Lohikoski, Mears, Taylor

CAOS-International Travel Fellowships – Reports by the 2005 Fellows

- 11:30 Navigated fracture reduction
Yoram Alexander Weil
- 11:40 Exploration of augmented reality technology for orthopedic skill training
Matthias Harders

Scientific Awards Ceremony

- 11:50 Best clinical podium presentation award
Sponsored by B. Braun Aesculap
- Best technical podium presentation award
Sponsored by DePuy
- Best clinical poster presentation award
Sponsored by B. Braun Aesculap
- Best technical poster presentation award
Sponsored by NDI Europe

Closing

- 12:00 Closing remarks
Paul A. Grützner
- 12:15 ADJOURN

Venue Information

Venue Heidelberg Convention Center
Neckarstadt 24
69117 Heidelberg
Germany

During the Meeting

Phone	+49-6221-142262
Fax	+49-6221-142266
Email	CAOS2007@CAOS-International.org

To carry out an event such as CAOS would not be possible without the support and contributions by the following companies and organizations. Their help is highly appreciated.



Grand Benefactor
BrainLAB AG
<http://www.brainlab.de/>



Gold Benefactor
B. Braun Aesculap
<http://www.aesculap.de/>



Silver Benefactor
Zimmer
<http://www.zimmer.com/>



Proceedings Benefactor
Stryker
<http://www.stryker.com/>



Award Benefactors
B. Braun Aesculap
<http://www.aesculap.de/>

*Best Clinical Podium and
Best Clinical Poster Presentations*



DePuy
<http://www.depuy.com/>

Best Technical Podium Presentation



NDI Europe
<http://www.ndigital.com/>

Best Technical Poster Presentation



MEM Foundation
<http://www.fmem.unibe.ch/>

*M.E. Müller Award for Excellence
in Computer Assisted Surgery*

Workshop Sponsors (in alphabetic order)



Exhibitors (in alphabetic order)

