Edition 02/2019

directLINK®

Magazine for Arthroplasty

»SPAR-K IS A BIG STEP FORWARD.«

Prof. Dr. Georg Matziolis on the new SPAR-K instruments for the LINK GEMINI SL Total Knee System

Efficient. Precise. Reliable.
The most relevant product information on the new SPAR-K instruments for the LINK GEMINI SL Totak Knee System.

Where is the EPRD heading?
An interview with Dr. Andreas Hey, managing director of EPRD, and Norbert Ostwald, LINK CEO.

Individual Solution by customLINK
A patient with a multiple operated comminuted fracture is pain-free for the first time with a sternoclavicular joint prosthesis.

The Spark of Enthusiasm

If you look up the meaning of the word »spark« in a dictionary, you will find that it means, among other things, respond with enthusiasm. SPAR-K is also the name of the new LINK GEMINI SL instrument system and stands for **s**u**p**erior **a**rticular **r**e-surfacing **k**nee. It also refers to the enthusiasm with which the developers brought SPAR-K to completion and for the extremely positive reactions of its first recipients.

Dear Readers,

Thomas Alva Edison was known for a long time as the inventor of the light bulb. But decades before him, various scientists had already developed electric light without producing commercially usable light bulbs. It was Thomas Edison who finally produced the first carbon filament lamp in 1879, which burned brightly for several days. His forward thinking of the initial idea laid the foundation for the electric light of today.

At LINK, we have also thought ahead in the development of our GEMINI SL Total Knee System. We have concentrated on the instruments because the portfolios of almost all implant manufacturers include knee implants and surface replacement systems with a similar design. We have thoroughly delved into the details and worked with outstanding experts to achieve further improvements at GEMINI SL.

The result of this hard work is the new SPAR-K instrument system for our GEMINI SL Total Knee System. It includes improvements that significantly aid surgeons and OR staff, such as the ability to precisely align the implant position and anchorage. Read the interviews with Prof. Dr. Georg Matziolis and Dr. Giuseppe Calafiore on page 2–5.

This edition also features interviews with PD Dr. Max Ettinger, who presents the results of his 3D planning study with our MobileLink Acetabular Cup System and our anatomically adapted hip system, SP-CL. Prof. Dr. Ralf Skripitz reports on his impressions of our new cemented LCU hip stem.

I hope you enjoy reading this edition of directLINK
Regards,

Helmut D. Link

»SPAR-K is a big step forward.«

Prof. Dr. med. Georg Matziolis on the new SPAR-K instruments for the LINK GEMINI SL Total Knee System

Professor Matziolis, you are a member of the development group for the new instruments for LINK GEMINI SL Total Knee System. What is unique about SPAR-K?

For SPAR-K, all instruments have been completely redeveloped so that they can be adjusted with millimeter and degree precision. Nevertheless, they are remarkably easy to use and allow a precisely reproducible surgical technique.

What does this mean for practice?

The femoral alignment for the distal femoral incision allows the valgus angle to be adjusted precisely. In tibial resection, the height can be adjusted to the millimeter. There is a 0- and 5-degree slope for the tibial incision. The SPAR-K allows for mulitple surgical techniques to be performed including measured resection, the tibia first and the extension gap first technique.

Which feature of SPAR-K do you like best?

One of my favorites is the ability to adjust the distal femoral section to the exact degree. However, I like the precision of the instruments – subsequent correction is rarely necessary, even with sclerotic bone. It fits with a single cut!

Why is SPAR-K the result of a global development project?

Because developers from several countries have come together. Each of them have already worked on large numbers of cases and therefore all have a lot of experience with various bone anatomies, especially concerning bone geometry and bone quality. The SPAR-K instruments can, therefore, be used globally.

Which surgical technique do you prefer for total knee replacement?

I prefer the extension gap first technique, which means that the release of the extension gap follows the distal femoral incision and the proximal tibial incision until it is symmetrical. Finally, I adjust the flexion gap by rotating the femur.

How does SPAR-K support surgeons in their surgical processes?

SPARK enables the use of any of the aforementioned surgical techniques with its simple and precise handling. It makes the surgery smoother and faster.

Is it also easier to train young surgeons with SPAR-K in the surgical technique for total knee replacement?

Yes, in all cases. Both during femoral rotation and distal femoral incisions, the millimeter and degree values can be read off exactly and are continuously adjustable. The assistant sees how the different surgical techniques influence the flexion gap, for example, if I vary the femoral rotation a few degrees inwards or outwards, or what influence another femoral incision has distally on the extension gap. It can be taught more easily thanks to the continuously flexible adjustment options.

What do the operating room staff say about SPAR-K?

They think SPAR-K is great because the instruments are remarkably easy to use, easy to assemble and robust despite the precision.

How does an international development team work?

Everyone contributes their experience with the various implants and instruments. Every developer also has favorite instruments that work very well and other instruments that are perceived as problematic. These experiences are compiled and then an attempt is made to transfer the well-functioning components to the new instruments and to eliminate the points that are perceived as problematic. Internationality is essential to cover the different geometries, bone qualities, soft tissue textures and sizes that a global instrument system requires.

What does it mean to work in a LINK development team?

I found the interaction in this team very respectful. The LINK engineers did not submit any finished products for us developers to agree with; our opinions had weight. When the engineers presented their solutions, the best solution was democratically selected until all the developers, engineers and the production team were satisfied. SPAR-K has therefore also become even more advanced.

Professor Matziolis, thank you for the interview.

INTERVIEW

Prof. Dr. med. Georg Matziolis
is Medical Director at the Waldkliniken Eisenberg, Chief Physician at the Clinic for Orthopaedics and Trauma Surgery, and Professor of Orthopaedics at the University Hospital Jena, Eisenberg Campus. Prof. Matziolis is a member of the international SPAR-K development group.


















spar-K
INSTRUMENTS

2ND SPAR-K PREMIER USER MEETING

4 to 5 April 2019 in Milan, Italy

LINKADEMY

»I think SPAR-K is the future.«

Dr. Giuseppe Calafiore implanted his first LINK GEMINI SL Total Knee System 18 years ago. In the past, he has gained experience with various instrument systems. In this interview he explains the importance of SPAR-K today and in the future.

Dr. Calafiore, 18 years ago you implanted your first LINK GEMINI SL Total Knee System. What configurations do you use?
I started 12 years ago with the Mobile Bearing configuration and six years ago with the PS configuration. Today I use both configurations in equal parts. My father was already working with LINK back in 1979, and I continue our working history with LINK.

What do you think of the LINK PorEx technology available for the GEMINI SL?
I think PorEx is a very good material and should be available for every implant worldwide. In particular, it can be an ideal solution for patients with allergies.

You've worked with all types of instrument systems since your first implantation of a GEMINI SL Total Knee System. Do the SPAR-K instruments have added value for you?
Indeed. SPAR-K instruments are extremely simple, intuitive, precise and allow a reproducible surgical technique. Gap balancing technique, mechanical alignment, measured resection technique – the SPAR-K instruments are very versatile and can be adapted for any surgical technique. SPAR-K is a perfect instrument system for the GEMINI SL.

What is your favorite function of SPAR-K?
I like everything about SPAR-K, but particularly the magnet inside the instruments. I also think the impactors are great because they have no contact with the soft tissues of the femur. I also really like the small size of the SPAR-K instruments. They simply feel right and make it much easier to use under the tight anatomical conditions of small knee joints.

Does SPAR-K help you train young surgeons?
Yes, that's an important point. Nowadays, many surgeons implant a knee prostheses freehand. However, I think that the future belongs to simple instruments that allow a reproducible surgical technique. In the next 15 years we will have 300 percent more knee arthroplasties than today. The many surgeons now working in high-volume centers, and their patients, will benefit from such a remarkably simple instrument system. I believe SPAR-K is the future.

Dr. Calafiore, thank you for the interview.

INTERVIEW

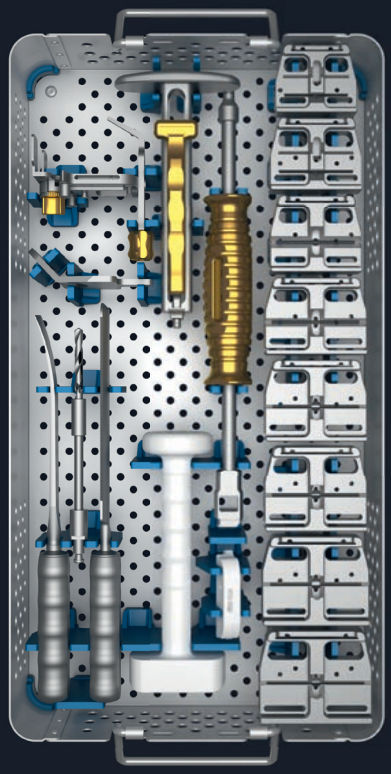
Dr. Giuseppe Calafiore MD
is a Consultant Surgeon, Knee and Hip Replacement at the Clinica Città di Parma and the Parma Clinic Humanitas Rozzano in Milan, Italy. He is also a member of the international SPAR-K development group.

spar-K

EFFICIENT. PRECISE. RELIABLE.

SPAR-K INSTRUMENTS
for the GEMINI SL Total Knee System

The GEMINI SPAR-K Instruments are designed to help the surgeon to consistently achieve optimal outcomes. They enable to precisely control the implant position and fit for each patient, thus assuring precise and reliable bone resections.



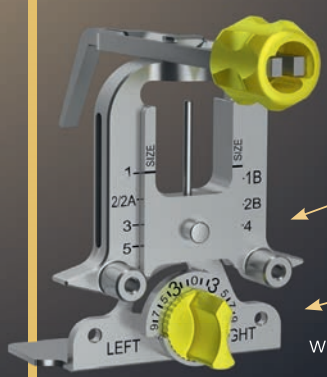
The instruments allow a variety of surgical possibilities such as:

- Femur first
- Tibia first
- Gap balancing

The colour coded actuators, the quick set/release functions and the single layer trays, allow for:

- a potential reduction of the learning curve
- reduced effort throughout the surgical process for both surgeon and scrub-tech personal

FEMORAL-SIZER



Anterior referencing

Femoral rotation capability from 0°- 9° with clear pre-setting at 3°

TIBIA-RESECTION

The resection level can be adjusted by repositioning the Tibial Cutting Block or by using the Adjustable Stylus.

FEMORAL-ALIGNMENT-GUIDE

Fast lock/unlock mechanism with colour code

Self-explaining fine tune adjustment

GEMINI SL KNEE

received a

7A* ODEP rating

A rating of 7A* is given to implants that have demonstrated at least **95% survival at 7 years** based on data meeting ODEP's criteria for the strongest data quality[1].

The **Mobile Bearing** configuration of the GEMINI SL received this high quality rating for a knee implant awarded by the United Kingdom's Orthopaedic Data Evaluation Panel (ODEP).

[1]Latest ODEP ratings can be found at www.odep.org.uk

Further information is available on our SPAR-K website. Just scan in the QR code with a smartphone or tablet computer.

Sternoclavicular joint prosthesis from customLINK for multiple fixed comminuted fracture of the clavicle.

In the summer of 2016, a 66-year-old patient suffered a medial comminuted fracture of the right clavicle with anterior sternoclavicular dislocation following a fall on his right shoulder. After various conservative and surgical therapy attempts as well as multiple sternoclavicular luxations, the patient's quality of life was significantly impaired. The patient – a general practitioner – did his own research and found the case of a LINK sternoclavicular joint prosthesis implanted 20 years ago. He therefore contacted LINK.

CustomLINK* planned and fabricated an individual sternoclavicular joint prosthesis based on the patient's CT data. In addition to the ball-joint, a compensation for translation was implemented to reproduce the kinematics of the natural joint even better than the first sternoclavicular joint prosthesis implanted 20 years ago.

The implantation of the custom-made sternoclavicular joint prosthesis was performed in spring 2018 by the chief physician of the Surgical Clinic of the Bischofswerda Hospital, Germany, Dr. Marc Naupert.

After the resection in the sternum area and the drilling of the core hole for the sternal bone screw with a drill and saw guide, the clavicle was also slightly resected so the joint could fit into the created space when pushed together.

Then, the medullary canal was prepared with a rasp, and the sternal bone screw was screwed into the sternum with the hexagon screwdriver (SW 3.5mm). The endosseous pin of the clavicular part of the prosthesis was then cemented into the clavicle lumen, the ball of the ball-joint was placed into the socket at the sternum screw, and the prosthesis halves were united using a countered union nut.

The patient is back playing sport at full capacity

At three months postoperative, X-rays show the fixed position of the sternoclavicular joint prosthesis without a resorption margin. The patient then decided to play table tennis again with full power as a right-handed player.

At one year and two months postoperative, the patient has only minor, weather-dependent abnormal sensations in the area of the injury; the function of the right arm is completely present.

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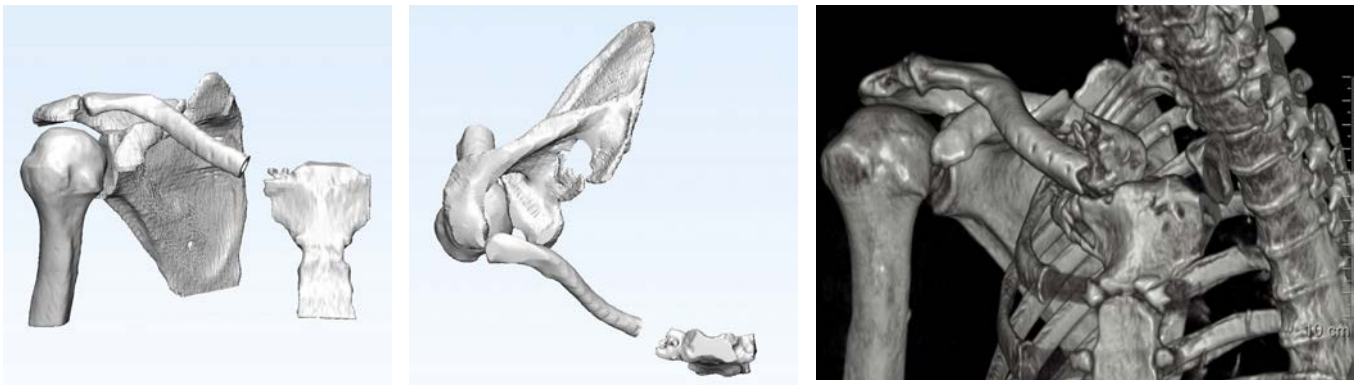
Dr. Gunter Boden
General Practitioner
gubolong@arcor.de

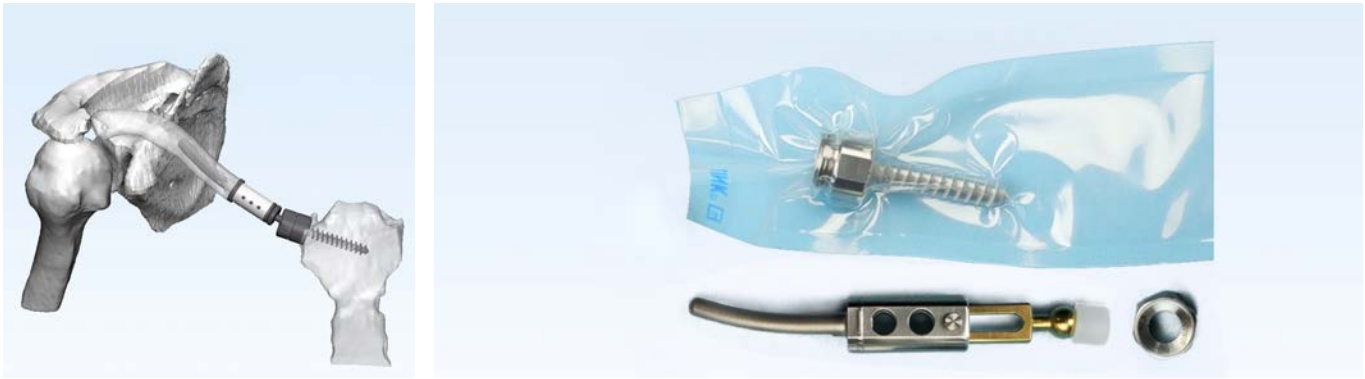
*__CustomLINK__ offers custom-made products for everything that cannot be covered by the wide range of standard products. This includes treatments for resections after tumors, complicated revision surgeries, or treatments of for pathologies for which no corresponding prosthesis is available on the market.
www.linkorthopaedics.com/de/fuer-den-arzt/produkte/customlink/

I. Preoperative findings



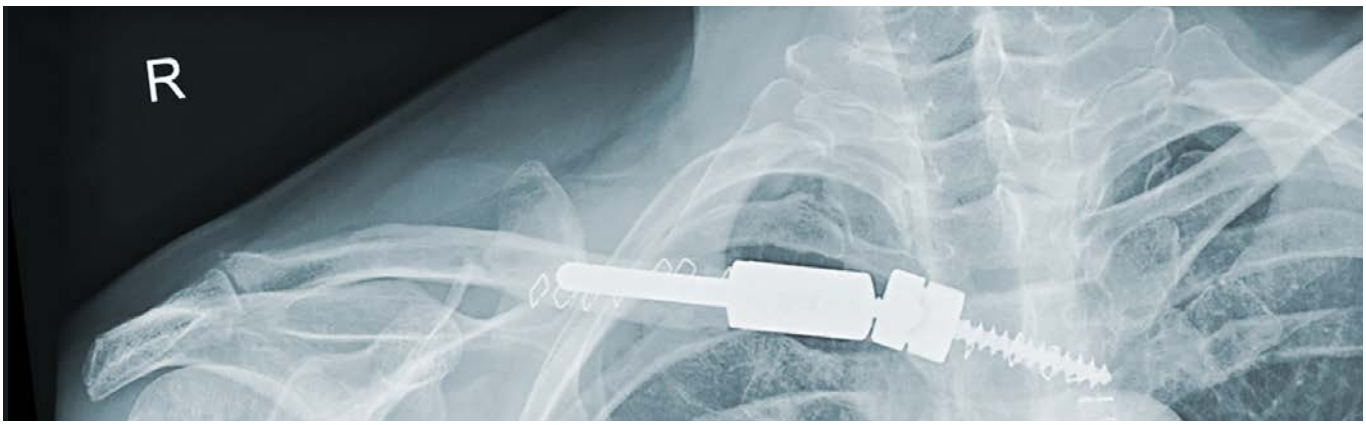
The preoperative CT images show the luxated sternoclavicular joint (left: ventral view, right: caudal view). Right: CT image after the accident.

II. CT planning



CT planning (left, ventral view) of a custom-made sternoclavicular joint prosthesis by customLINK (sternum bone screw: 6.5 x 35mm, clavicle shaft: Ø 6 x 40mm (cemented), space for the joint: approximately 45mm, longitudinal movement: approximately 15mm, material: CoCrMo/PorEx/UHMWPE)). Right: the sternoclavicular joint prosthesis fabricated by customLINK with sternum bone screw and cap nut.

III. X-ray three months postoperative



X-ray three months postoperative: the sternoclavicular joint prosthesis is fixed; no resorption seam is visible.

INTERVIEW

PD Dr. Max Ettinger
is a senior physician and head of the Computer Assisted Surgery and Tumor Orthopedics section of the Department of Endoprosthetics and Reconstructive Joint Surgery Hip/Knee of the DIAKOVERE Annastift in Hannover, Germany.

»What we planned in 3D could be implemented unchanged.«

PD Dr. Max Ettinger and his colleagues have conducted a study on 3D planning accuracy associated with the implantation of LINK's MobileLink Acetabular Cup System and the anatomically adapted hip system, SP-CL. In this interview, he discusses the results and what they mean for surgeons, OR staff, and clinics.

Dr. Ettinger, how did your study of 3D planning accuracy come about?

We are seeing increased need for the fundamental replacement of the anatomic reconstruction of joints. For the hip, there are parameters such as lateral offset that can be planned relatively precisely in a regular X-ray image. Other parameters can only be recorded three-dimensionally, such as the anterior offset, which has a significant influence on muscle bias and joint stability. The first studies confirm how important it is to reconstruct the hip anatomically on a precise one-to-one basis, and this is only possible in 3D.

What was your study approach?

Before the surgery, we prepared a three-dimensional CT from the pelvis to the foot of six donor bodies. We digitally planned the implant into the anatomical reconstruction of the hip and, from there, determined the size of the implant. However, the aim of our study was not just the anatomical reconstruction of the hip. We also wanted to know how exactly the surgical result fits the planned size of the cup and stem.

Why?

Standard X-ray planning works relatively well, but the result can sometimes be three implant sizes too high or too low. The reason for this is that X-rays do not provide precise planning and only

allow relatively vague and imprecise anatomical reconstructions.

What can you say about the results of your still unpublished 3D study?

In the knee area, we can already look back on over 100 3D-planned reconstructions in which neither the implant size nor any other parameter had to be changed. Our study has confirmed that anatomical hip reconstruction works. We know this because, after the surgery, we got CTs of the implants in situ and found that what we had planned in 3D could be implemented unchanged; all planned shaft and cup sizes fitted the donor bodies. This is very interesting for the transfer of our results to the clinic.

What do the results mean for doctors, OR staff, and clinics?

If you can rely one hundred percent on your 3D planning, an implant manufacturer could send you the required implants just in time to the OR based on the 3D plan. One would only need another implant size as a back-up. The clinic would no longer have to maintain a large storage capacity.

If you want to make sure that the 3D planned implant fits precisely, to the millimeter, in the patient's joint, you need instruments to verify this in surgery; how far have you progressed with this?

We are currently working on a joint project with the chair of Control and Regulation Engineering at the University of Siegen on the development of measuring instruments that tell us, for example, when we have placed the cup precisely at the position that corresponds to our 3D plan.

Does 3D planning have other advantages in addition to the lower storage capacity?

If the 3D-planned implants are delivered just in time to the OR, the saving on storage capacity is just one advantage. The number of trays needed for the surgeries can also be reduced in this way, as can the operating times themselves. However, precise planning would also significantly reduce X-ray time in the OR. This is good for patients, but also for staff and surgeons, who sometimes have to perform ten or more X-rays per surgery.

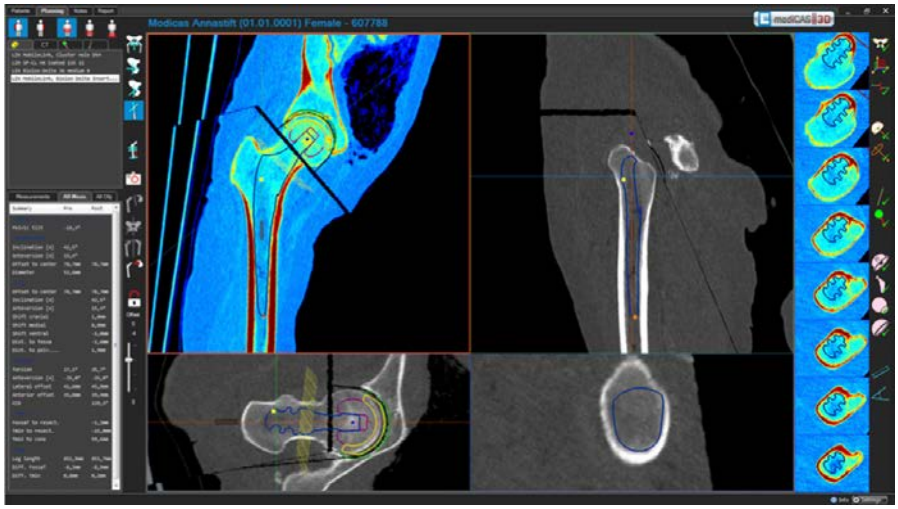
Do the results of your study justify doing a CT before primary implantation as a basis for 3D planning?

From my point of view, definitely. The CT of 20 years ago is not the CT of today in terms of the number of X-rays. In Belgium, for example, a CT is done before every implantation of a knee prosthesis, among other things, to reconstruct the natural knee rotation with the implant.

How long will it take for drones to deliver the 3D-planned implant just in time?

From our side, the basis for delivery by drone is already in place today. However, I think that the implants continue to be delivered by mail or courier.

Dr. Ettinger, thank you for the interview.



PD Dr. Max Ettinger: »With 3D planning, all relevant parameters become visible. Even conventionally unquantifiable parameters such as the anterior offset can be anatomically reconstructed.«

The Mission Continues:
40 Years of Success with the LINK Endo-Model

In 1979, LINK sent the Endo-Model on a mission to support orthopedic surgeons worldwide with a simple solution for complex primary and revision surgery. This review of the four decades of the LINK Endo-Model Rotational and Hinge Knee Prosthesis for primary and revision surgery highlights LINK's great success story.

After Waldemar Link opened his business for hospital supplies in Hamburg in 1948, a new era in arthroplasty began: In 1963 LINK developed the first German total hip prosthesis (named the St. Georg model); the St. Georg knee sled prosthesis followed 1969. In 1979 LINK developed an intracondylar rotational knee prosthesis, named the Endo-Model Rotating and Pure Hinge Prothesis.

Excellent long-term results and very good clinical results

Four decades later, the LINK Endo-Model is available in four sizes to a steadily growing global user network.

The Endo-Model has excellent long-term results[1, 2, 3] of 98.5 percent survival after 15 years[2], and very good clinical results[1, 4.] Based on the unchanged core design, the knee system has intrinsic stability[1, 4, 5] with excellent kinematic functions[6].

Surgeons have many options with the Endo-Model. Whether used as a primary prosthesis for revision cases, as a rotational knee or as a hinged knee, the Endo-Model enables axial rotation and reduces forces acting on the prosthesis anchorage.

Four decades of maximum protection of bone substance and high primary stability

The Endo-Model is regarded as an artificial knee joint with very low bone resection due to its dimensions, and, therefore, ensures the highest possible protection of the bone substance in primary and revision cases. In addition to high primary stability, the Endo-Model also features natural movement sequences that are gentle on anchoring.

[1] G. Petrou et al.; Medium-term results with primary cemented rotating-hinge total knee replacement - A 7- to 15- year follow-up, THE JOURNAL OF BONE & JOINT SURGERY (Br), 2004

[2] A.N. Mavrodontidis, S.I. Andrikoula, V.A. Kontogeorgakos, G.C.Babis, T.A. Xenakis, A.E. Beris; P.N. Soucacos Application of the Endomodel Rotating Hinge Knee Prosthesis for Knee; Osteoarthritis Journal of surgical orthopaedic advances, 2008

[3] T. Gehrke, D. Kendoff, C. Haasper; The role of hinges in primary total knee replacement; THE BONE & JOINT JOURNAL, 2014

[4] F. Sanguineti et al.; Total knee arthroplasty with rotating-hinge Endo-Model prosthesis: clinical results in complex primary and revision surgery; Arch Orthop Trauma Surg, 2014

[5] L. Felli, M. Coviello, M. Alessio-Mazzola, M. Cutolo; The Endo-Model rotating hinge for rheumatoid knees Orthopäde; 2016

[6] A. Atrey, N. Hussain, O.Gosling, P. Giannoudis, A. Shepherd, S. Young, J. Waite; A 3-year minimum follow up of Endoprosthetic replacement for distal femoral fractures - An alternative treatment option; Journal of Orthopaedics, 2017

With the LINK Endo-Model, physicians have many options at their disposal: 1) Endo-Model rotational and hinge knee prosthesis for primary and revision surgery, cemented; 2) Endo-Model-M modular knee prosthesis for primary and revision surgery, cementless; 3) Endo-Model-W, intracondylar version, cementless; 4) Endo-Model-W, total condylar replacement; and 5) Endo-Model rotational and hinge knee prosthesis with PorEx (TiNbN = titanium-niobium-nitride surface modification).

40 YEARS OF ENDO-MODEL®

AROUND THE WORLD

Surgeons worldwide report on their experiences with the LINK Endo-Model

On the occasion of LINK's 40th anniversary, orthopedic surgeons worldwide report on their experiences with the Endo-Model. The video documentation can be accessed via the website **www.linkorthopaedics.com** or by scanning the QR code (see right) with a smartphone or tablet computer.

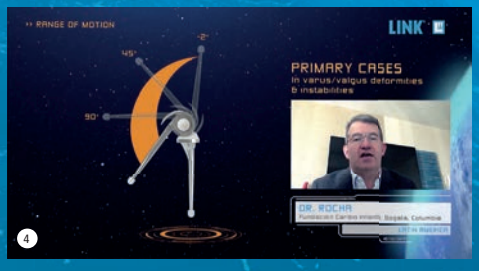
1

Prof. Dr. Thorsten Gehrke (1): »One of the most remarkable features is the position of the compromised axis. It is positioned in the posterior part of the joint. That leads to decreased pressure of the patella against the sheath.« **Dr. Gurava Reddy (2):** »I have been using the Endo-Model for the last five years. It is my hinge prosthesis of choice any day.«

3

2

Prof. Brett R. Levine (3): »The Endo-Model has been a great addition to the portfolio for me. It has provided good outcomes for my patients. It is easy and reproducible to use.« **Dr. César H. Rocha (4):** »The most successful solution in my hands for patients with varus/valgus deformities and instabilities is the use of the Endo-Model as an implant that corrects an angular deformity in the varus/valgus and provides safe medial and lateral stability with a high mobility of up to 142 degrees of flexion.«



4

INTERVIEW

Dr. Patrick Mouret
Dr. Patrick Mouret is Head of the Prosthetics Division at the Sana Klinikum Offenbach. In August 2017, he conducted the first implantation of LINK's MobileLink Acetabular Cup System.

»I have completely switched to the MobileLink Acetabular Cup System.«

Dr. Patrick Mouret conducted the first implantation of the MobileLink Acetabular Cup System in August 2017. Even then, he noticed the simple implantation technique and the stable press fit feeling. This interview is about his 18 months of experience with the MobileLink.

Dr. Mouret, how many MobileLink Acetabular Cup Systems have you implanted since your first implantation?

I have completely switched to the MobileLink Acetabular Cup System. I combine the MobileLink with the SP-CL stem or the C.F.P. stem from LINK, depending on the patient. That brings me to approximately 100 implantations a year.

In which patients are you implanting the MobileLink?

I use the MobileLink acetabular cup in combination with the SP-CL hip stem in patients with hip dysplasia. I implant the MobileLink with an inclining insert adapter in patients with acetabular dysplasia as an alternative to an acetabular roof plastic. In younger patients, I combine the MobileLink with a cementless C.F.P. hip stem that preserves the femoral neck.

How are your results?

I haven't had a case of primary loosening yet. Only one patient who received an adapter solution suffered dislocation. The cup can normally be easily inserted into the bone in the appropriate position with a standard hammer. In this case, I had a very steep cup but had not milled enough bone so that the cup could be inserted deep enough.

Which advantages of MobileLink have the most significant influence on the results?

Of course, we have to wait for the ten-year results. But the primary stability is very good, which is seen on the X-ray. The secondary osseointegration is also very good. If a small seam in the pole area of the prosthesis can still be seen on the X-ray during primary implantation, this has completely disappeared after three months. In my opinion, the reason for the good osseointegration is the rough TiCaP double coating together with the slightly flattened pole design and the extended equator design of the cup.

The MobileLink provides a choice between a ceramic and a UHMWPE insert; what does this mean for the surgeon?

Having this choice has great advantages. If you can use cups with inserts made of different materials, this is much easier, and the risk of confusion is much lower.

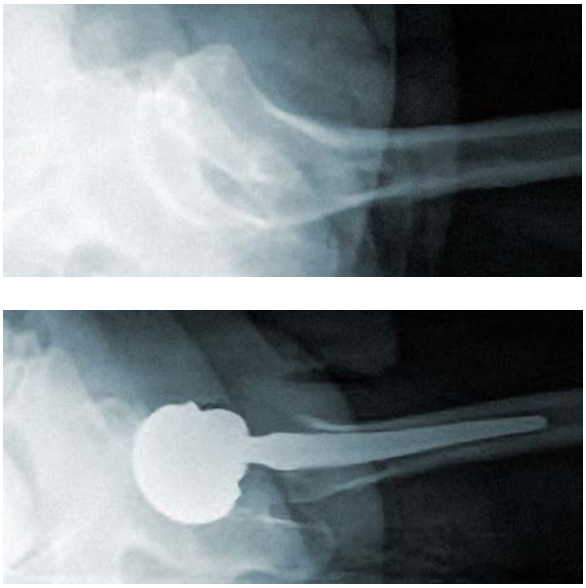
How advantageous is the color coding of the packaging in everyday surgical practice?

Very advantageous! The colors help the young surgeons who have not yet gained much experience in surgery and helps them to handle the implants safely. The color coding refers to the metal carrier and the insert so that they cannot be confused. For example, if you use an adapter, the insert must be the size of the adapter and not the size of the original cup. If the color of the adapter is black, the insert must also be black.

Can the MobileLink be described as a significant step in the development of acetabular cup systems?

I am very satisfied with the MobileLink. It is a significant step in the right direction as there are currently many press fit cups on the market. I do not use screws because my philosophy is that a press fit cup that is not primarily stable enough is difficult to fix with screws. In combination with the SP-CL stem or the C.F.P. stem, the MobileLink Acetabular Cup System works very well.

Dr. Mouret, thank you for the interview.



Preoperative X-ray at upper left: In the axial view, according to Johannson, the acetabulum is laterally recognizable. Postoperative X-ray at lower left: MobileLink Acetabular Cup System with SP-CL stem in situ. Right: MobileLink Acetabular Cup System with TiCaP double coating. Top left: Cup with shouldered E-DUR insert. Top right: Cup with ceramic insert. Bottom: Multi Hole Cup with adapter and X-LINKed Insert.

INTERVIEW

Prof. Dr. Ralf Skripitz
is Head of the Center for Joint Arthroplasty, Foot Surgery, Pediatric and General Orthopedics and the Maximum Care Joint Arthroplasty Center at the Roland-Klinik in Bremen, Germany.

»The new cemented LCU hip stem from LINK allows intra-surgical switching to the cementless version.«

Prof. Dr. Ralf Skripitz was one of the first surgeons in Germany to implant the new cemented LCU hip stem from LINK. This interview is about his experiences with the new implant.

Professor Skripitz, you have implanted the new cemented LCU hip stem from LINK around 60 times. What is your impression?
My colleagues and I are very impressed with the cemented LCU and instruments. We find it particularly helpful to be able to easily switch from the cementless version to the cemented version intraoperatively with the LCU.

What is special about the cemented LCU?
For me, it is the design of the LCU. It allows easy insertion of the stem even with a small access. The essential point, however, is modularity: I can use the same rasp with the cementless and the cemented LCU version. That allows me to switch intraoperatively from the cementless to the cemented version if, for example, the bone quality turns out not to be as good as initially expected.

Would this also be possible vice versa?
If I initially plan a cemented implantation of the LCU due to the age of the patient and find out during the surgery that the patient's bone quality is very good contrary to expectations and the rasp is kind of stuck in the bone, I can also implant the cementless version of the LCU. On the one hand, this avoids the risks that cementation can entail, such as embolisms. On the other hand, it also saves surgical time, the bottom line at my clinic being seven minutes. That is quite an advantage that should not be over looked, especially for older patients.

In which indications do you implant the cemented version of the LCU?

One of the main indications for implanting the cemented version is osteoporosis. In these cases, I always cement, even if there is no clear data on when to implant cemented or cementless. According to data from the Norwegian National Advisory Unit on Arthroplasty and Hip Fractures*, patients will only be better off in the long term, if they have received a cementless implanted prosthesis before the age of 55. Otherwise, in the long term, there seems to be no difference between cemented and cementless implantation.

How often do you switch from one version to the other intra-surgical, or vice versa?

Due to the exact planning for the approximately 700 hip prosthesis implanted each year at our clinic, this only happens about 20 times.

Does the switch go smoothly?

The switch is entirely smooth because same rasp systems can be used for the cementless and the cemented versions of the LCU. Realistically, you only need to have the cement in the operating theatre if you want to switch to the cemented version. In our clinic, there are cement syringes on all operating theatres trays anyway so that we have no delay when switching from the cementless to the cemented version of the LCU.

How do you rate the LCU instruments?

It is positive that the same instruments can be used for the cementless and the cemented LCU versions. The critical point, however, is that the instruments are easy to use. As a surgeon, you want to have an instrument in your hand that is so simple to use that you don't need time to get used to it. I have have a good feeling about the instruments of the LCU – not only in terms of simplicity but also in terms of stability and construction.

What role does the new label on the packaging play in practice?

I find the label very important for handling, and it completes my very positive impression of the cemented LCU. It immediately shows whether the packaging contains the cemented or the cementless LCU version. The cemented LCU has the black underlaid yellow lettering »cemented« on the blue packaging, which immediately catches the eye. A mix-up is therefore hardly possible.

Professor Skripitz, thank you for the interview.

*Norwegian National Advisory Unit on Arthroplasty and Hip Fractures.
http://nrlweb.ihelse.net

LCU hip stem, cemented
The LCU is available as a standard hip stem and as a lateralising hip stem in eleven sizes. The dimensions of the stem and the offset increase harmoniously with size. The stem is made of the cobalt-chromium-molybdenum alloy (CoCrMo) ENDODUR-S.

From the left: Dario Lupo (LINK), Dr. Jon Minter, DO, Gunnar Erb (LINK), Helmut D. Link, Jim Thornton (LinkBio), Greg Pomasl (LinkBio), Robert Bell (LinkBio), Christian Hanke (LINK), Dr. Malte Steiner (LINK)

Orthopedic Specialist Dr. Jon Minter from Atlanta, USA, visits LINK

Dr. Jon Minter, DO, of Georgia, USA, specializes in the innovative surgical management of failed joint-replacement surgery. The orthopedic surgeon's portfolio includes complex cases in which he uses LINK custom-made pelvic prostheses. On February 1, 2019, Dr. Jon Minter visited the LINK production facility in Norderstedt near Hamburg, where he discussed selected patient cases with Helmut D. Link and employees (see photo above).

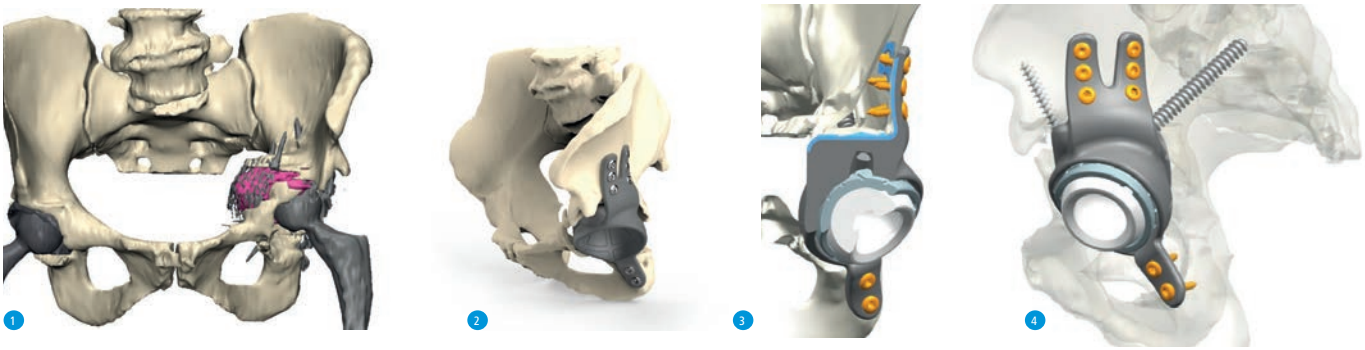
During his presentation, the US surgeon presented the case of a 73-year-old female patient with bilateral hip joint replacement, who had suffered several left-sided dislocations and finally a pelvic fracture with a loosening of the left acetabular cup.

For the revision of the acetabulum, LINK fabricated a pelvic partial-replacement prosthesis, based on CT data of the patient's pelvis, that precisely matched her anatomy. After the problem-free implantation, the postoperative X-ray showed a good fit of the implant, at the site of the defective pelvic bone.

A strong cancellous bone screw helps to firmly anchor the implant.

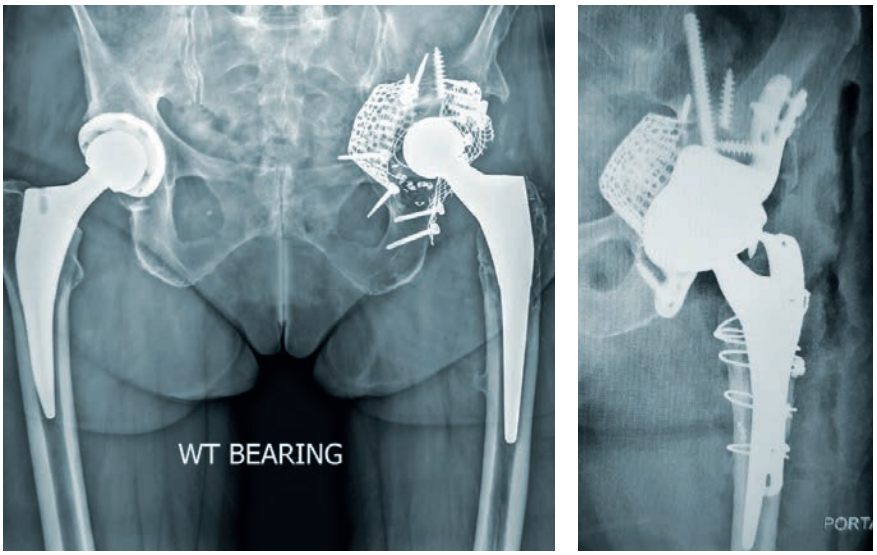
The anchorage, with a cranial cancellous bone screw that leads into the healthy bone of the remaining os ilium, is also clearly visible, as is the attachment of the flanges of the implant; additionally, cerclage wire stabilizes the hip joint. »Fortunately, we were able to insert a long stabilizing screw in the patient's existing good bone, which is unfortunately not always possible«, Dr. Minter described the situation. »It is really beneficial to have a selection of screws of different lengths.«

After his visit to LINK, Dr. Minter was a speaker at the *International LINK-ademy Symposium* in Dresden, Germany, where, among other topics, he presented his concept for a two-stage exchange in periprosthetic infections (see pages 24–25).



3-D models of the LINK custom-made department (left and center left) and illustrations of the cranial cancellous bone screw (right), based on CT data of the patient's pelvis

It fits the anatomy precisely: the custom-made LINK pelvic partial-replacement prosthesis. LINK pelvic partial-replacement prostheses are usually additive titanium components whose bone contact surfaces have the osseoharmonic TrabecuLink structure. They are supplied with trial prostheses, drill guides and resection guides, and operating instructions.



The pre-operative X-ray (left) shows the left-sided loosened acetabular cup; the hip joint is stable post-operatively (right); the anchoring of the pelvic prosthesis with a cranial cancellous bone screw is also seen.

DR. JON MINTER, DO

Dr. Jon Minter, DO, is an orthopedic specialist in Georgia, USA, specializing in the innovative surgical management of hip and knee osteoarthritis and failed joint-replacement surgery. Dr. Minter works at various hospitals in the United States, including Northside Hospital Forsyth in Atlanta, Georgia.

DR. ANDREAS HEY

Dr. Andreas Hey is Managing Director of EPRD Deutsche Endoprothesenregister gGmbH.

»The EPRD is indispensable as the foundation of Germany's implant register.«

What does the Endoprothesenregister Deutschlands (EPRD), launched in 2012, contribute to quality improvement in arthroplasty? How effective is the register? What is its future? An interview with EPRD Managing Director Dr. Andreas Hey and LINK CEO, Norbert Ostwald.

Dr. Hey, how successful is the EPRD?

Dr. Andreas Hey: We have assembled data from over 1.1 million hip and knee arthroplasties and more than 95 percent of all implants used in Germany in our database. Around 750 of 1,200 clinics active in arthroplasty participate in the EPRD.

Which data does the EPRD evaluate?

Dr. Andreas Hey: We evaluate anonymized patient data, basal surgical data, and data from the individual implants. The AOK Bundesverband and the vdek[1] provide us with data twice a year and, as well as, revisions that we have not recorded.

Does the EPRD use this data to name poorly performing clinics?

Dr. Andreas Hey: No, the data provided to us is confidential; all clinics, patients, manufacturers, and health insurance companies participate voluntarily.

Mr. Ostwald, LINK has been involved in the EPRD from the very beginning, why?

Norbert Ostwald: We have already worked with the Swedish Hip Arthroplasty Register[2] during its development. Mr. Link has always been particularly interested in the results of the register. Some LINK products, such as the anatomical SP II hip prosthesis, are represented as benchmarks in the Swedish Hip Arthroplasty Register[2]. As a manufacturer claiming to develop high-quality implants, we have a moral obligation to participate in the EPRD. We also know from experience how important good register results are for the marketing of our products. For example, we describe our products as precisely as possible so that the data can be easily processed and evaluated.

Dr. Andreas Hey: The precise classification of the implants reveals abnormalities in the implants and answers questions such as: Does ceramic behave differently from metal, or: What is the significance of head sizes? The EPRD data will also be able to map implant properties in the long term.

How else does the EPRD contribute to quality improvement?

Dr. Andreas Hey: The participating clinics receive benchmarking twice a year, in which their results are anonymously compared with those from other clinics. This information is used by many surgical teams to change implantation strategies and purchasing strategies. Some clinics also use their good results for budget negotiations with health insurance companies. The evaluation of our data also helps manufacturers in technical discussions with the notified bodies.

Does the EPRD differentiate the causes of complications after arthroplastic procedures, for example, by surgical technique, surgeon, or implant?

NORBERT OSTWALD

Norbert Ostwald is the CEO of Waldemar Link GmbH & Co. KG, VACUCAST Feinguss GmbH & Co. Metall KG, and the R&D company called DERU GmbH.

Dr. Andreas Hey: No, we don't record surgery numbers or the names of individual surgeons. We limit ourselves to essential data for the various surgical indications. Additional data collection parameters would reduce the clinics' willingness to participate in the EPRD. If the performance of surgeons were to be monitored, this could mean that difficult cases would be treated less frequently in the long term, so that personal surgical track records would not deteriorate.

How can the differences between the results of the EPRD and the results of other registers in revisions be explained?

Dr. Andreas Hey: The level of the revision rate expresses how a healthcare system deals with these interventions. The EPRD overlooks three years of data, but it presents revision rates twice as high as the National Joint Registry for England, Wales, Northern Ireland, and the Isle of Man [3]. In the UK, however, there are very long waiting lists for such surgeries and very strict rules as to which implants are reimbursed. If only a part of the prosthesis is replaced or if an infection is suspected, this is already considered a revision in Germany. In such cases, British surgeons tend to wait and see how the situation develops.

The German Federal Government wants to nationalize the register; what will change?

Dr. Andreas Hey: The government draft for the German implant register will force patients, clinics, manufacturers, health insurance companies, and private health insurers to participate. We assume that the EPRD data will be transferred and that the German implant register will also use the knowledge of the EPRD staff.

Mr. Ostwald, the purchasing policy leads to implant manufacturers undercutting each other in price. Some clinics change suppliers because of a 20 euro difference, which is to the detriment of the register results; can this be prevented?

Norbert Ostwald: First of all, it shows that competition among implant manufacturers in Germany works. However, this competition also means that hospitals frequently change their implant suppliers. In other countries, especially in countries where the state funds the healthcare system, the results of registries are often the decision criteria for the use of implants. In Sweden, for example, our customers are willing to pay for high-quality implants. One of the reasons for this is that the cost of revisions is a major factor in the choice of primary care solutions.

Dr. Hey, how do you see the future of the EPRD?

Dr. Andreas Hey: I assume that we will play a major role in setting up and operating the new German implant register and that it will be a success story just like the EPRD. The EPRD is indispensable as the foundation of the future German implant register. I would like to thank all parties involved in the EPRD, the professional associations, the AOK Bundesverband, the vdek, the manufacturers, and the clinics for their commitment. Without this cooperation, the EPRD would certainly not have come this far.

Norbert Ostwald: I can fully confirm that. What I have experienced in recent years as one of the representatives of the German Medical Technology Association (BVMed) is the incredibly constructive cooperation between all those involved. I hope that the German government will take this into account when implementing the German implant register.

Dr. Hey, Mr. Ostwald, thank you for the interview.

[1] Verband der Ersatzkassen e. V.
[2] The Swedish Hip Arthroplasty Register, https://shpr.registercentrum.se.
[3] National Joint Registry for England, Wales, Northern Ireland and the Isle of Man; www.njrcentre.org.uk.














INTERNATIONAL SYMPOSIUM 2019

Current Challenges in Hip & Knee Surgeries

February 04–05, 2019 in Dresden, Germany

LINKADEMY

27 Nations at the International LINKademy Symposium 2019 in Dresden

More than 220 orthopedic and trauma surgeons from 27 nations attended the International LINKademy Symposium in Dresden for two days in February 2019. Chaired by Prof. Dr. Carsten Perka, seven sessions and more than 50 lectures dealt with the current challenges in hip and knee surgery. Particularly challenging cases were presented to the audience for discussion, and joint proposals for solutions were developed.

The focus on the first day of the symposium was on complex indications for primary knee replacement surgery (TKA). The speakers dealt with the topics of obesity, indications for bilateral TKA, and extended indications and results of unicondylar knee replacement (UKA).

The session *Complex Anatomy in Hip and Knee Surgery* session was a successful addition. Dr. César H. Rocha of Bogotá, Colombia, presented his comparison of the LINK Endo-Model with the standard TKA in the valgus knee. On the subject of implant selection, the speakers discussed TKA revisions and the selection of the most suitable implant for complex hip surgery. The first day ended with a joint dinner at the Dresden Transport Museum.

Periprosthetic infections and indications for distal femoral replacement (DFR)

The diagnosis of and therapy for periprosthetic infections was the focus of the second day of the symposium. Dr. Alexander Benko from Minsk, Belarus, presented his advice for success in the revision of an infected joint. Mr. Alan Norrish, MD from Cambridge, UK, lectured on the indications for DFR in complex fractures.

Patient optimization and alternatives in failing standard care solutions

The last session was dedicated to the outlook on the technologies and trends of the future. The lecture by Dr. Wolfgang Klauser from Damp, Germany, on the reduction of morbidity and mortality through patient optimization, was received with interest. Helmut D. Link's final point on his company's secret weapon for all cases in which standard solutions are no longer applicable was also very well received.

Chairman

Prof. Dr. Carsten Perka
Medical Director,
Charité – Universitätsmedizin Berlin, Germany

Speakers

Dr. Benjamin Bender
Private Practice Joint Replacement Surgeon, Assuta Hospital Tel Aviv, Israel

Dr. Alexander Benko
Associated Professor, Belarussian Medical Academy of Postgraduate Education in Minsk, Belarus

Dr. Basilio de la Torre
Head of Department, H.U. Ramón y Cajal, Madrid, Spain

Prof. Davide Maria Donati
Director 3rd Orthopaedic and Traumatologic Clinic Prevalently Oncologic, Rizzoli Orthopaedic Institute, Bologna, Italy

Dr. Alois Franz
Chief Physician St.-Marien-Krankenhaus Siegen, Germany

Dr. Daniel Godoy
Chief Physician Hospital Italiano de San Justo, Buenos Aires, Argentina

Prof. Bernardo Innocenti
Chair of Biomechanics,
Université Libre de Bruxelles, Belgium

Dr. Wolfgang Klauser
Chief Surgeon, Helios Ostseeklinik Damp, Germany

Mr. Helmut D. Link
Proprietor, Waldemar Link GmbH & Co. KG, Hamburg, Germany

Prof. Dr. Georg Matziolis
Medical Director, Waldklinken Eisenberg, Germany

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Arthritis and Total Joint Specialists, Northside Forsyth Hospital, Alpharetta, USA

Rhidian Morgan-Jones, MD
Orthopaedic Surgeon, University Hospital Llandough (UHL), Cardiff, Great Britain

Alan Norrish, MD
Consultant Orthopaedic Surgeon, Cambridge University Teaching Hospitals, Great Britain

Sean O'Leary, MD
Consultant Orthopaedic Surgeon, Royal Berkshire NHS Foundation Trust London, Great Britain

Prof. Dr. Carsten Perka
Medical Director, Charité – Universitätsmedizin Berlin, Germany

Dr. César H. Rocha
Orthopaedic Surgeon, Fundación Cardio Infantil, Bogotá, Columbia

Amir Sandiford, MD
Consultant Limb Reconstruction (Hip and Knee), St George's Hospital, London, Great Britain

Prof. Yihui Tu
Director Orthopaedic Department, Yangpu Hospital affiliated to Tongji University, Shanghai, China

Prof. Stefano Zaffagnini
Director, 2nd Orthopaedic and Traumatologic Clinic Rizzoli Orthopaedic Institute, Bologna, Italy

Dr. Akos Zahar
Consultant Orthopaedic Surgeon, Helios Klinikum Emil von Behring, Berlin, Germany

Prof. Dr. Claudio Zorzi
Chief Surgeon, Ospedale Sacro Cuore Don Calabria, Verona, Italy

LINK products in the curent medical literature

Complications and survival of megaprostheses after resection of bone metastases

De Gori M et al. J Biol Regul Homeost Agents. 2017 Oct-Dec;31(4 suppl 1):43-50.

Uncemented short stems in primary total hip arthroplasty

Loppini M. Grappiolo G. EFORT Open Rev. 2018 May; 3(5): 149–159. Published online 2018 May 9. doi: 10.1302/2058-5241.3.170052.

Risk Factors for Subsidence of Modular Fluted Tapered Stems Utilized During Revision Total Hip Arthroplasties for Periprosthetic Hip Fractures

Parry JA et al. J Arthroplasty. 2018 Sep;33(9):2967-2970. doi: 10.1016/j.arth.2018.05.006. Epub 2018 May 9.

Anatomic grooved stem mitigates strain shielding compared to established total hip arthroplasty stem designs in finite-element models

Heyland M., Checa S., Kendoff D, Duda GN. Scientific Reports volume 9, Article number: 482 (2019), published: 24 January 2019.

Total knee arthroplasty using hinge joints: Indications and results

Carlos Rodrfguez-Merchän E., Effort Open Revies (EOR), VOLUME 4, 1 APRIL 2019, 001: 10.1302/2058-5241.4.180056 www.erortopenreviews.org

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NEW: LINK in Russia

Since November 2018, LINK has been in Russia, with its complete range of hip and knee implants; LINK Orthopedic East LLC is based in Moscow.

»Russia is a very large market for high-quality implants and, therefore, very interesting for LINK,«, says LINK CEO Norbert Ostwald. »It was time to be physically represented there by a competent team.«

Currently, five sales employees work in the new LINK branch in Moscow.

Norbert Ostwald, CEO of Waldemar Link GmbH & Co. KG, an the Managing Director of Link Orthopedic East LLC, Irina Sugurova

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