IBRA International Bone Research Association

FLASH 2020

Editor's Message

At the end of a very outstanding and successful 2019, we were able to look back to IBRA's 15th anniversary, which we were able to celebrate together with our members in more than 60 countries all over the world. The increased number of new member applications has resulted in the doubling of our number of members overall. This increase has been largely due to the introduction of our new Basic Membership option, which was created specifically for those who wish to stay better connected with our society and to find out more about the opportunities IBRA offers before becoming full members.

This very encouraging membership growth is also accompanied by our increased educational activities in Europe, North America, Latin America, Asia and Australia. We can also proudly inform you that we have managed to complement our worldwide training center network by acquiring new dedicated centers in the Asia region. As an important step forward in our strategic growth, we have begun building our IBRA North America Chapter, which will better allow us to keep our finger on the pulse of the region and to quickly react to any educational demands as they arise, as well as to learn about new ideas and novel approaches from members in this region.

The COVID-19 pandemic has impacted the lives and well-being of every human on this planet and, just like many of you, the IBRA had been obliged to change most of our plans for 2020. Now that national and international restrictions are beginning to be relaxed, we are allowed to start planning our events activities for autumn 2020 and for the coming year, ensuring, of course, that we fully comply with all COVID-19 safety measures.
We look forward to welcoming you at one of these future events!

The IBRA Administration Team

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IBRA – an organization of surgeons for health care professionals

IBRA is committed to providing our members with resources and benefits to support their personal development, and to facilitating networking in medical training, education and research.

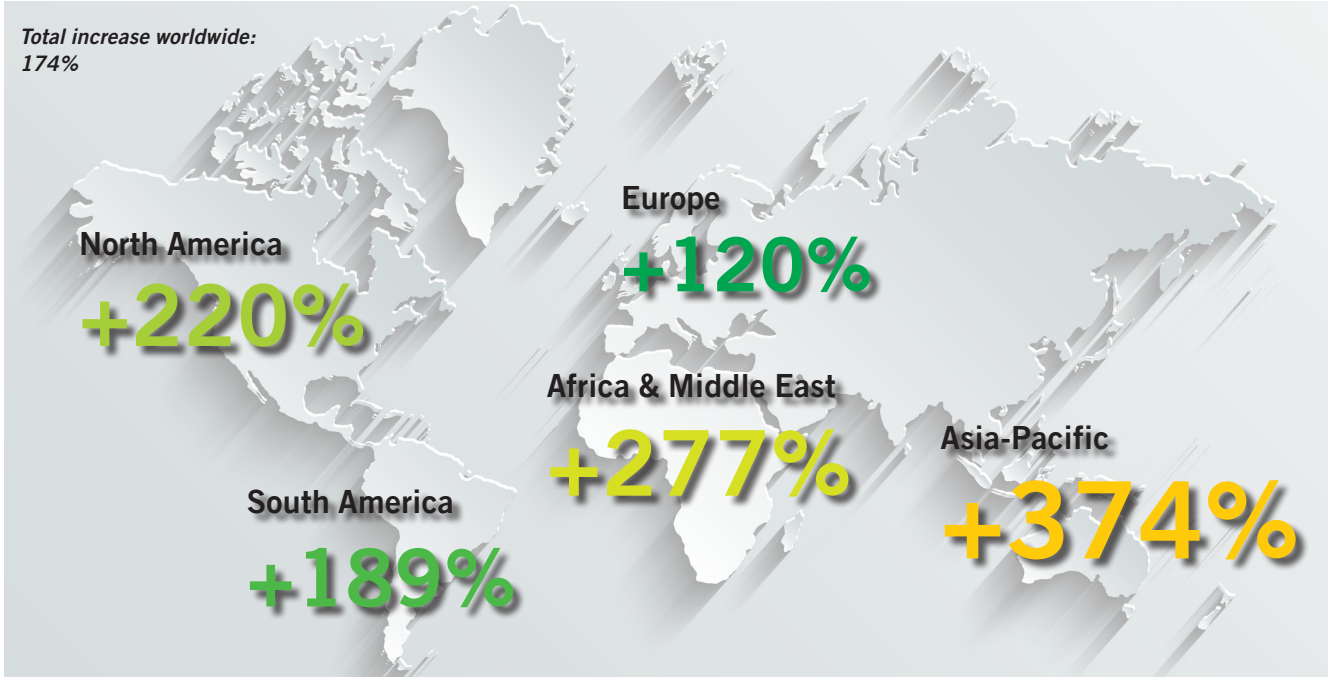
IBRA members shape our organization in various ways. Our decision-making board is made up of members, as are our Research and Education Committees; other members serve as faculty; and yet others participate in educational events by exchanging experience with specialists in training centers or getting involved in research.

In May 2019, we introduced our Basic IBRA Membership, which is the ideal gateway to our organization for those who would like to be associated with us but who do not yet wish to become full members. This additional level of membership exists alongside our Full Membership option and it allows prospective members to choose which level best suits their needs.

Basic Membership
This is our entry-level IBRA membership. Any health care professional working in orthopaedics and/or traumatology can join through the IBRA website. Basic Membership allows the new member to receive regular updates on IBRA events; to access our member area, which contains a growing number of documents, presentations, recorded webinars and event photo galleries; and to contact other members.

Full Membership
In addition to enjoying all the privileges included in the Basic Membership, full members have access to courses of various levels at a significantly reduced course fee (a 50% reduction). Because of the ability to access courses, only surgeons are admitted to this membership level. Additionally, our Full Members constitute the "voting body" of the IBRA General Assembly.

We are very proud to announce that our membership base has grown by more than 170% in just one year. We can now rely on the commitment of our highly motivated and engaged members in more than 60 countries. The increase in IBRA activities in regions such as Asia, Australia and the Americas is one of the reasons for our growth in numbers. Our members around the globe can enjoy connecting with like-minded colleagues through our newsletter and webinars, the IBRA Member Area, YouTube and social media platforms, such as LinkedIn and WeChat. Moving forward, we aim to extend the variety and quantity of formats for the virtual education opportunities we offer.



COVID-19 Safety Measures Implemented for IBRA Courses

We take the safety and well-being of everyone attending our events very seriously.
IBRA is constantly monitoring any developments in the COVID-19 situation and taking appropriate and necessary precautions. The following protocols and procedures have been put in place to protect the health of our course participants so they will still be able to personally interact with colleagues and take part in hands-on workshops.

General
- Hand sanitizing stations throughout the facility
- Additional cleaning of session rooms during breaks

Registration
- Masks offered upon entry into the facility
- Contactless registration onsite at the event

Lunch
- Individual lunch boxes
- Enough space in order to ensure social distancing

Coffee breaks
- Individually packed snacks and beverages

Seminar – theoretical part
- Meeting space large enough to ensure social distancing

Workshop – lab
- Participants are encouraged to arrive wearing scrubs to mitigate unnecessary contact in the locker rooms
- Obligatory PPE distributed: scrubs, gowns, masks, gloves, surgical caps and face shields
- More space between workstations

Transfer
- Larger or more shuttle buses to ensure enough space for distancing

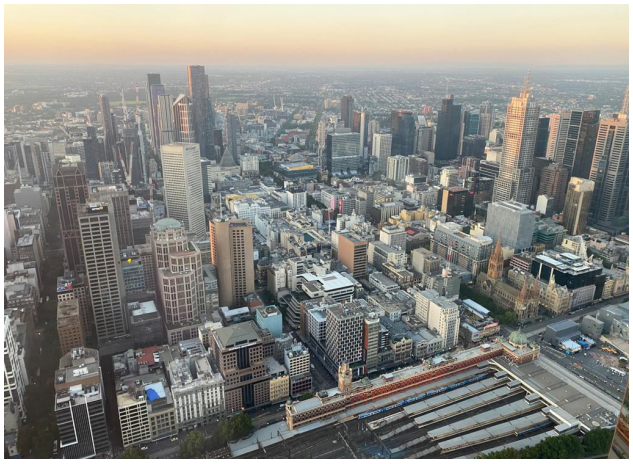
The suggested protocols may be subject to change based on local conditions and regulations. Please visit the IBRA website for the most up-to-date information. Any feedback or suggestions regarding our safety measures are openly welcomed.
We are always willing to improve our quality, service and compliance for the well-being of our community.

→ www.ibra.net

Experience Report on the IBRA Master Course in Melbourne, Australia

Prof. Dr. med. Rainer H. Meffert
Head of the Department of Trauma, Hand, Plastic and Reconstructive Surgery
(Surgery II)
University Hospital of Würzburg
Germany

After a long but pleasant trip from Frankurt, Germany, to Melbourne with a short stop in Abu Dhabi, I met Patrick Koop from IBRA in the lobby of our hotel to talk about our agenda for the coming days and, in particular, about the schedule for the IBRA Master Course, as it had been planned using a new format. After a short night's sleep (due to jet lag of 11 hours), we went out for a walk to enjoy a beautiful sunrise in the amazing business district of Melbourne, taking the opportunity to visit the observation deck of the Eureka Tower.



The evening started with a faculty dinner at which we met the Course Chairman Professor Greg Bain from Adelaide, Professor Randy Bindra from the Australian Gold Coast, Dr. Jeff Ecker from Claremont, Dr. Jan-Ragnar Haugstvedt, from Oslo, Norway, and Professor Toshiyasu Nakamura from Japan.

The evening was a pleasant opportunity to make contact, exchange knowledge and experiences, and share thoughts about future perspectives. It also gave us the opportunity to talk about our expectations for this course, which would include pre-fractured specimens for the arthroscopically assisted reduction of severe radiocarpal injuries for the first time. The main sponsors of the course were Medartis for implants and Storz for 4K high-resolution endoscopes.

On 10th March, the bus picked us up at 6:45am in the hotel lobby for an early start in the lab! Thank goodness there was time for coffee before we started. After registration, Greg Bain began by extending a warm welcome to all the participants and showed an opening video. He allowed me a few minutes to introduce IBRA's philosophy and structure, including the scholarship programs, which are a fantastic opportunity for IBRA members. The theoretical part was clearly structured and included five talks on radius fractures and wrist arthroscopy techniques. The twenty-two participants had a very high level of experience, including in wrist arthroscopy techniques.

There were only 2–3 surgeons per specimen, which meant a lot of time for training, as well as identifying advantages as well as limitations of the arthroscopy techniques. The combination of scopes with traction towers as well as plates and screws allowed participants to "play around" and find new ways of proceeding. Some used the traction tower to hold reposition, most of us used the scope to control the intra-articular fragments in the distal radius. Evaluation of the TFCC in avulsion fractures of the ulnar styloid process revealed interesting findings.

After carefully evaluating the new course format, we decided we would certainly recommend doing more courses of this type in the future. However, making some changes would allow for more options in training, including arthroscopically assisted techniques and percutaneous maneuvers.

The networking dinner with the faculty, participating surgeons and representatives of Medartis and Storz was held in a beautiful locale at the lofty height of 89 stories.

At the dinner, I had an excellent conversation with several colleagues about IBRA's international network. Among the people I spoke to was Brett McClelland, a hand surgeon from Newcastle, Australia, who gave us a detailed insight into the structure of his hand unit. Similarly to my clinic in Würzburg, in Newcastle, both trauma surgeons and plastic surgeons support the hand unit with their expertise.

The next day, we met Eugene Ek and Jason Harvey from the Melbourne Academic Centre for Health who showed interest in sending surgeons to IBRA Training Centers for one year, a program that IBRA has not yet set up. However, we all felt that a three-month stipend would be adequate support in addition to the hospital's stipend for this type of long-term exchange. In the afternoon, Patrick Koop and I departed for Sydney, a city that features an impressive skyline (pictured), consisting of the CBD (Central Business District), the iconic Sydney Opera House and the Harbour Bridge.

In Sydney, we met Harvey Brown, who took us to Newcastle the following morning. As a distributor in that area, he introduced us to colleagues from the John Hunter Hospital, a very busy level I trauma center that takes care of a large area and population, very much like our medical center at the University of Würzburg.

However, Zsolt Balogh, the Director of Trauma, informed us that his facility topped Würzburg's 245 trauma patients with an ISS > 16 in 2019 by approximately 100 more patients.

James O`Sullivan, a foot and ankle surgeon, who had already attended one of the IBRA Master Courses in Basel, was very keen to learn more about the activities and perspectives that IBRA offers. As head of the IBRA Training Center for foot & ankle surgery in Newcastle, he showed particular interest in sharing his experience in foot and ankle surgery with scholars.

David Nicholson, who splits his time between the John Hunter Hospital and his private practice, gave us a short insight on his work in foot and ankle surgery – mainly sports injuries.

Last, we met Joshua Hunt, a hand surgeon at a private practice who is also on call for the hand unit at the Newcastle trauma center. He mainly works in wrist and hand trauma and also has a special interest in implants.

Back in Sydney, I had the opportunity to meet with Bernard Schick, one of the leading hand surgeons in the country. He has extensive experience in vascular grafts for avascular necrosis in scaphoid fractures.

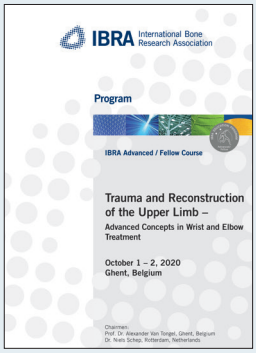
In summary, Patrick Koop and I had the impression of a highly progressive health care system within many types of modern structures. We would be very happy to increase our collaboration with Australia in the future. Unfortunately, the journey is quite long and costly, so webinars or video conferences may be an excellent option in the future. The outbreak of the coronavirus in Europe meant I had to return home sooner than planned.

Things have changed considerably for us recently, just as they have all over the world, and, as always, we are all doing our best to maintain the best possible standards, even in the face of this pandemic.

Kind Regards,
Rainer Meffert

IBRA ADVANCED / FELLOW COURSE

Trauma and Reconstruction of the Upper Limb –
Advanced Concepts in Wrist and Elbow Treatment



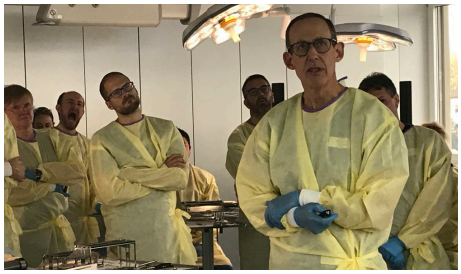
This course continues the close exchange between participants and faculty through creating a clinically based learning environment in which the principles and techniques of treating traumatic wrist and elbow conditions can be understood and applied. Through a combination of interesting case-based lectures and interactive discussions, our internationally renowned faculty will address the relevant topics in wrist and elbow surgery.

October 1–2, 2020
Ghent, Belgium

More information at: https://www.ibra.net/Events

Report – MASTERS TEACHING MASTERS

From 14–16 November 2019, "Fractures of the Upper Limbs" were diagnosed and treated by renowned Master surgeons from all over the world in Lucerne, Switzerland. Led by Hermann Krimmer (hand & wrist), Lars Müller and Kilian Wegmann (both elbow & shoulder), IBRA was honoured to welcome faculty from North America, Graham King, from Asia, Ranjit Gill, and from many European countries too, Denise Eygendaal, Wolfgang Hintringer, Radek Kebrle, Matthias Königshausen, Martin Leixnering, Alexander van Tongel and Adam C. Watts. At the edge of the Swiss Alps, the participants animatedly discussed topics and cases from the shoulder to the fingertips and used their combined expertise to treat challenging fractured specimens in the workshops.



Each day started with a short warm-up session on the theory of one of the three selected topics, in which the speakers shared their individual perspectives. On the first day, Wolfgang Hintringer presented the new approach "CT-based classification for radius fractures"; on the second day, Graham King elaborated on "Distal humerus fracture ORIF: approach and reposition technique"; and on day three, Adam Watts spoke about "Technical pearls for stable fixation: augmentation possibilities".

To begin the workshops, the participants were given x-ray and CT scan images on tablets, offering a realistic setting in terms of pre-operative planning. The teams of Master-surgeons then decided together on the classification of the fracture and therefore the appropriate technical approach and treatment. The participants used an x-ray guided surgical approach to their pre-fractured specimens and intra-operative radiographic, as well as anatomical, findings were used to present their cases to the other groups and review the treatments. As a three-day event and surrounded by a beautiful scenery, the event offered excellent opportunities for getting to know the person behind the pen or scalpel.

IBRA EDUCATION PROGRAM Resident

Resident Courses

Target audience
Recommended for senior residents and physicians in sub-specialty training

Main specialty
The course offers the basics in clinical diagnostics, treatment and follow-up. The focus is on state-of-the-art surgical techniques.

Objective
Learning state-of-the-art interventions

IBRA EDUCATION PROGRAM Advanced/ Fellow

Fellow Courses

Target audience
Recommended for fellows, attendings / consultants

Main specialty
The faculty members first classify the injury or deformity, and then share their preferred approach, treatment, and follow-up of cases with advanced levels of difficulty

Objective
Handling challenging cases

IBRA EDUCATION PROGRAM Master

Master Courses

Target audience
Recommended for senior surgeons and department heads

Main specialty
An interactive seminar and hands-on workshop, addressing trauma and reconstruction with representative cases and discussions. The international faculty presents the latest innovations, and provides an opportunity to exchange experiences with the participating senior surgeons.

Objective
Re-thinking good practices, promoting improvements

→ www.ibra.net

Interview with Prof. Dr. Jörg Grünert about his experiences in the Republic of Korea

Prof. Dr. med. Jörg Grünert
Head of the Department of Hand, Plastic and Reconstructive Surgery
Kantonsspital St. Gallen
Switzerland

Professor Grünert, you've long been fascinated by and interested in Korea. What motivated you to get involved with this country, its culture and its language?

My fascination for Korea began back when I was a medical student. In 1981, I visited Korea for the first time and I also joined a medical service in So Rok Do, which was a center for treating leprosy patients. I remember patients being carried on the backs of their relatives to be taken to hospital and also that access to medical care was not easy for everyone at that time. I was training in martial arts – Taekwondo – at that time (2nd Dan) and was enthusiastically learning the Korean language as well. I was very interested in the Asian philosophy and way of thinking. This enriched my life and my attitude towards life and I still have some close friends in Korea.

Do you see a different approach to medicine or treating patients in Korea or Asia in general compared to Europe?

Korea has not only further developed, but has also perfected its medical service. There are high quality institutions treating impressive numbers of patients and leading medical personalities, who are now experts from whom trainees should go and learn. The medical culture there is a combination of its own special Korean style and top-rated modern treatments carried out with the highest level of skill.

Koreans are well known for being very advanced in technology and digitalization. Where do you see the greatest impact of this in the healthcare system?

The modern universities of Korea are outstanding and of the highest quality. The techniques in surgical care and surgical skills taught there are admirable and this is due to the high number of top experts they have. Their hospitals have modern digital capabilities and our Korean colleagues have extensive experience due to the large number of patients they treat. Their training facilities are also superb.

What do you think doctors/surgeons in other countries could learn from their Korean colleagues?

Their art of combining perfectionism with endurance and eager engagement.

You travelled to South Korea last year to co-chair the IBRA course there with Professor Park. On this occasion, you also visited the W Hospital in Daegu and the Korea University Anam Hospital. What were your impressions and experiences of the course and these medical facilities?

I was impressed by the perfect organization of the various events. There were many participants with whom you could easily discuss various matters. It was a pleasure to share experiences. I was also extremely impressed with Professor Woo and his private institution for hand surgery – an institution specifically for trauma care and microsurgery

on a private basis, where trauma patients are treated and expert microsurgery services are provided continuously, 24 hours a day, 7 days a week. This is in stark contrast to our western institutions, as private clinics tend to focus on elective surgery.

This spring, IBRA's first Training Centers for Upper Limbs in Asia were added to our global network: the Korea University Anam Hospital in Seoul, where the IBRA course took place last November, and the Seoul National University Bundang Hospital in Bundang. As you once studied in the Republic of Korea yourself and you travel there regularly, what recommendations could you offer someone interested in pursuing study in Korea?

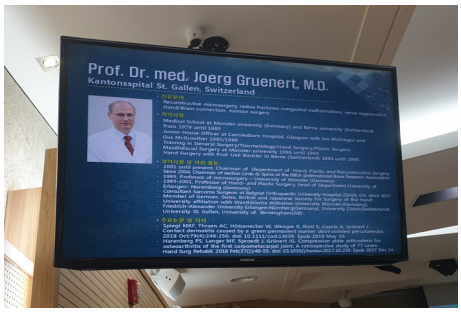
I can wholeheartedly recommend looking to the East for study. These days, the long distance can be easily overcome, communication is readily possible and the colleagues are very open to discussion and sharing. It will prove to be a unique experience and many pleasant encounters with warm and agreeable people.

Now a more general question, how do you see the future in (hand) surgery? What challenges do you think surgeons will face?

A good hand surgeon still has to hone and perfect his or her surgical skills. Having good experience in microsurgery and osteosynthesis and practicing these abilities will also be instrumental for being a good hand surgeon in the future. You can develop your expertise through discussions and exchanges with colleagues and for that you need to actually meet your colleagues, so attend conferences and workshops.

Can you identify any new trends or changes in continuing medical education?

It is good to see how quickly and easily medical knowledge and experiences can be spread in a digitalized world, but learning how to perform certain procedures can often only be learned directly from a good teacher.



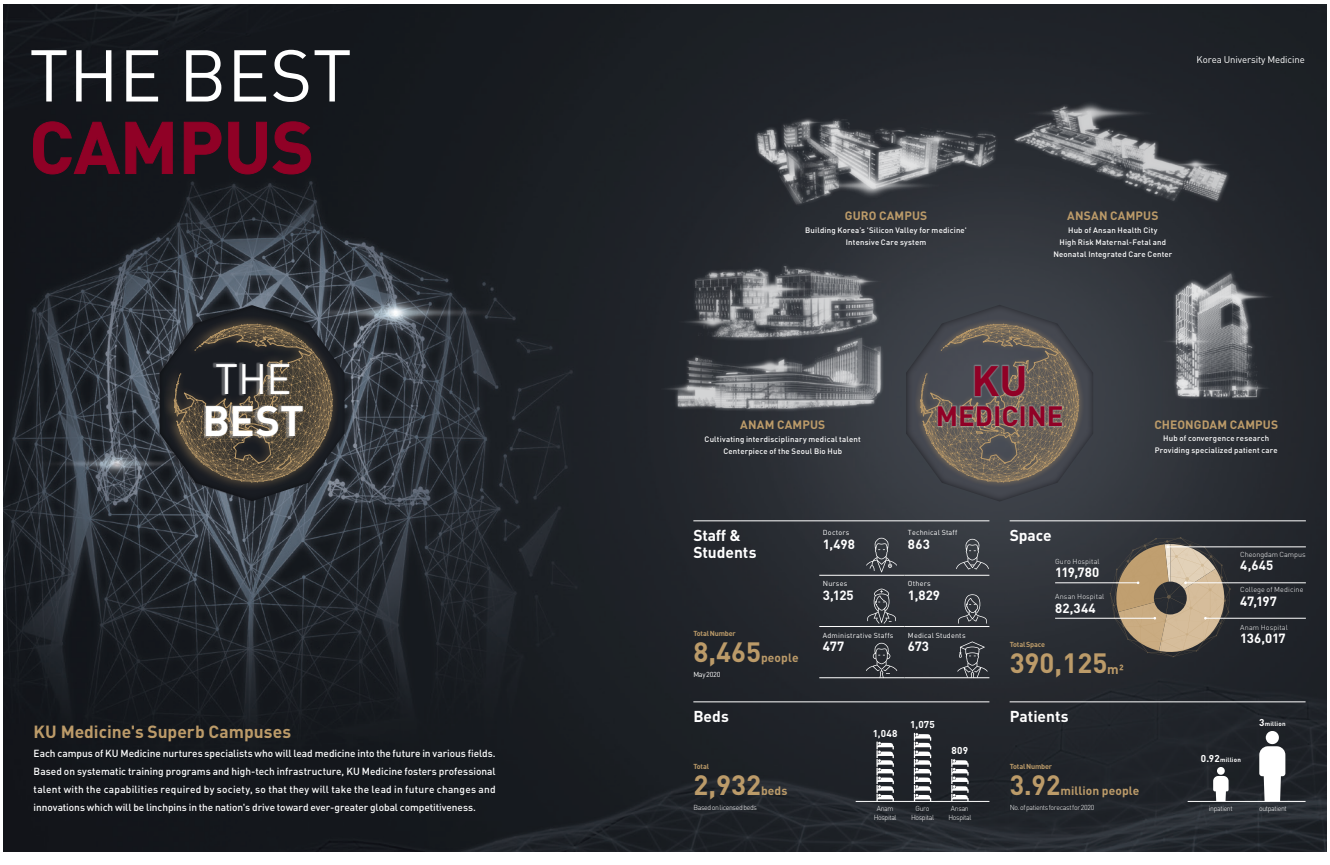
The first IBRA Training Center for Upper Limbs in Asia: Korea University Anam Hospital in Seoul

Fellowship Director Prof. Jong Woong Park, MD, PhD

Prof. Jong Woong Park, MD, PhD
President of The Korean Fracture Society
Deptartment of Orthopaedic Surgery
Chief of Hand Surgery & Reconstructive Microsurgery
Korea University Anam Hospital
Seoul, Korea

The Korea University Medical Center is located in the heart of Seoul. It is composed of 3 hospitals and a college of medicine. The main campus, near Anam Hospital, is very beautiful and is a top-ranked university in Korea. The three hospitals of the Korea University Medical Center treat more than 3.79 million patients each year on an inpatient and outpatient basis. In each hospital, our hand surgery & reconstructive microsurgery specialists take care of patients with hand-related problems.

All members of our team are board-certified hand surgery specialists. Of the three hospitals, Anam Hospital has more than 1000 beds and a brand-new smart facility is currently being constructed. In our daily practice, we teach and train hand surgery fellows and orthopaedic surgery residents. As research is our common interest, our team is also enjoying and investigating many research projects related to surgical devices, nerve regeneration, human-machine interfaces and 3D printing technologies.



What motivated you to open an IBRA Training Center at your facility?

The Korea University hand surgery & reconstructive microsurgery team had the very great opportunity to host the IBRA Seminar & Workshop in Seoul, Korea in November 2019. During the course, many participants from around the world shared their experiences and learned from each other. Furthermore, many distinguished speakers showed very enthusiastic devotion for the exchange of knowledge and experiences through interactive case discussions, especially Prof. Jörg Grünert, who has been a very good friend of mine for a long time and who kindly guided our group through the two successful days of courses. I also appreciate all the IBRA staff for their enthusiastic devotion. At this workshop, we found out more about the IBRA scholarship program for young surgeons and the role of IBRA Training Centers. I was inspired by the spirit of the IBRA Training Centers and their role in international medical education and I wanted to become part of the global network of IBRA training institutions.

How would you integrate IBRA scholars in the work routine at your facility? Can you explain what a visiting surgeon's average workday might look like?

The visiting surgeons will be our good friends and co-workers. They will have the opportunity to participate in the meetings of our orthopaedic team every morning and assist in hand surgery and reconstructive microsurgery on both an inpatient and outpatient basis. During surgical procedures, we can share knowledge and experiences with each other. At least once a week, we set a laboratory day and if they want to, they can join the ongoing, interesting research projects and meet many research collaborators specializing in mechanical and electrical engineering.

How would the scholar be integrated – are there any associations or programs for exchange with colleagues at the hospital?

Many orthopaedic surgeries are carried out in our department and visiting surgeons will have the chance to assist in or observe the variety of surgeries related to orthopedics. Furthermore, visiting doctors will be able to visit the other two hospitals (Guro and Ansan hospitals) of the Korea University Medical Center and share their experiences with other hand surgeons working in those hospitals. They will also be en-couraged to participate in international and regional medical conferences about orthopaedic surgery and hand surgery. Furthermore, they are welcome to join our research programs, which are conducted in collaboration with the Korea Institute of Science and Technology and the Department of Computer Science and Engineering at Korea University.

The Korea University Hand Surgery Team at the FESSH conference in Copenhagen in 2018.

Research on a bionic hand in a monkey model

What do you think the highlights of a scholarship at your clinic would be?

Visiting surgeons will be able to establish a good working relationship with our team and Korean hand surgeons and they will become life-long friends. Clinical and research experiences will enrich our spirits and knowledge.

What are your expectations of the scholarship applicants? What do you think you and your team will gain from this experience?

Sharing experiences and ideas is most valuable and text-book knowledge will never substitute this precious sharing.

Please describe your and your team's experiences of the IBRA course held at your clinic last year in November.

During the IBRA course at our hospital last year we experienced a strong sense of unity under the same interests and the name of IBRA. We got highly positive feedback from the participants, which confirms that the seminar and workshop were very well structured and that we met expectations throughout. I would like to thank the Board of Directors of IBRA for providing us with the opportunity and support to host this successful course in Korea. And I hope that further medical education events may be organized in the Asia-Pacific region in the future.

IBRA Scholarship at the Academic Teaching Hospital, Feldkirch, Austria

Fellowship Director: Univ.-Doz. DDr. Oliver Ploder

Scholarship Program B from 1 to 30 September 2018

Dr. Thiago Martins Magalhães Ramos
João de Barros Barreto University Hospital
Belém, Brazil

Please describe your experience with your IBRA scholarship at the Academic Teaching Hospital Feldkirch.

My time at the hospital in Feldkirch was fantastic. I had the opportunity to take part in many surgeries, some of which I had not seen before. Consequently, I learned a lot, for example, about the virtual planning of surgeries. The exchange with colleagues there motivated me to study more and to gain knowledge in additional areas of expertise.

What are the reasons that motivated you to apply for a fellowship at the Academic Teaching Hospital Feldkirch with Dr. Oliver Ploder?

Since I began my residency, I always hoped to have an experience abroad, especially in the orthognathic field. Dr. Ploder has been very kind and flexible since the very first time we made contact. He and his team made me feel comfortable from day one until the end.

How did you benefit on a personal and a professional level from this scholarship?

Thanks to the time I spent at the hospital in Feldkirch, I was able to learn about new techniques in OMFS and different approaches, as well as being exposed to another culture and language. I also had the opportunity to do some networking with other colleagues, even from my own country, during the orthognathic workshop in Basel last year.

What were the highlights of your scholarship?

Sharing experiences and knowledge with colleagues from other countries is always extremely interesting and rewarding. Furthermore, I got the opportunity to travel and to visit several places in Austria and other European countries. I was also invited to attend the IBRA course in Basel, Switzerland which was a great addition to the practical knowledge I had acquired during my scholarship.

Would you recommend this type of scholarship to other surgeons?

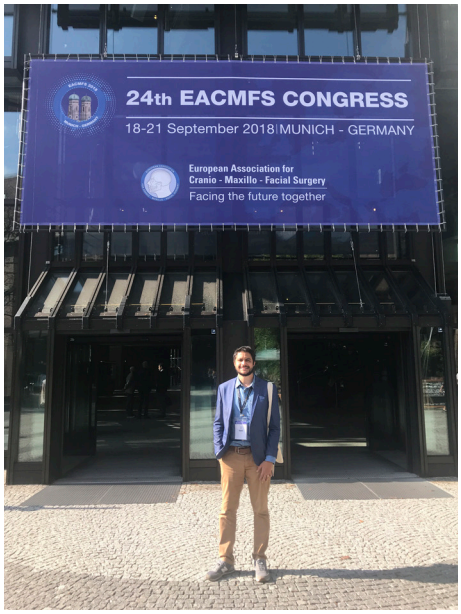
Yes, absolutely. While I was in Austria, many of my friends back in Brazil asked me about my stay and about what exactly I was doing there. When I told them, quite a few of them got very interested in the IBRA scholarship program and would now like to apply as well. I would definitively recommend applying for an IBRA scholarship to all my colleagues. It was the experience of a lifetime.

What advice and recommendations would you give to colleagues who are considering applying for an IBRA scholarship?

First of all, you need to choose which area of expertise you want to learn about/assist in, then I'd advise you to contact the supervisor in charge of the hospital you are interested in and check if they would accept you and, if so, for how long and when. Second, you should request an acceptance letter, if it has not already been sent. With this letter and letters of recommendation, you can then apply for an IBRA scholarship, keeping in mind the application deadlines.

Has the scholarship had any impact on your daily working life now that you are back at your facility? If yes, please explain further.

Yes, definitely. I learned some great things during my time in Austria, in Feldkirch, then in Germany (for the EACMFS 2018 in Munich) and Switzerland, in Basel, that I still use now at my facility. Dr Ploder gave me a practical lecture in orthognathics during surgery, explaining a lot of details. This was very helpful in order to apply in practice the knowledge acquired through books and articles.



Academic Teaching Hospital Feldkirch

Feldkirch, Austria
Department of Oral and Maxillofacial Surgery
Fellowship Director: Univ.-Doz. DDr. Oliver Ploder

The Academic Teaching Hospital Feldkirch is located in the west part of Austria, close to the border with Switzerland. The Department of Oral and Maxillofacial Surgery is internationally acclaimed for excellence in clinical care, education and scientific research. The department covers the whole range of oral and maxillofacial surgery, with special emphasis on:

- traumatology
- orthognathic surgery
- oncology surgery and reconstructive surgery, including microsurgical reconstruction
- cleft palate surgery
- cosmetic surgery (e.g. blepharoplasty, septorhinoplasty)
- implantology and preprosthetic surgery
- oral surgery

Around 900 inpatients and 15,000 outpatients are treated each year in the department and an average of 4,000 surgical interventions are performed. The medical staff are committed to providing the highest level of patient care. The team plays a major role in inter-departmental collaborations with groups including neurosurgery, ENT, ophthalmology, radiology, pathology, orthodontics, prosthetic dentistry, and radiotherapy. Specific scientific interests of the department are: orthognathic surgery (stability, planning, TMJ, nerve recovery, head posture, mandibular widening, micro-screw fixed appliances); implantology (bone resorption, callus distraction, long-term results); traumatology (bone plates, long-term results, childhood fractures); access-based database for the evaluation of outcomes.

We offer several postgraduate programs, such as the oral surgery course, which consists of 5 modules taken over 5 weeks, including live surgery and assisting in surgery (offered once a year). A 2-day course on cone beam computed tomography (CBCT) with case studies and a practical component (offered twice a year). Our team works closely with the Vienna General Hospital and the University Hospital of Munich. Visiting doctors and fellows are welcome to actively and/or passively participate in all the department's activities. Both short and long-term visits are possible. The specific training program will be individually arranged with each candidate.

IBRA Scholarship at the Galeazzi Orthopaedic Institute, Milan, Italy

Fellowship Director: Alberto Lazzerini MD

Scholarship Program B from 7 October to 8 November 2019

Dr. Robert Walker
University of Arizona College of Medicine
Phoenix, United States of America

What were your professional and personal expectations of the scholarship?

I expected to learn different techniques and variations of techniques in hand surgery. I also wanted to learn about a different health system structure and how patients go from clinic to the OR and how different logistic systems lead to different healthcare outcomes.

What is the main focus of the IBRA training center (in general and of the department) you attended?

The main focus of my IBRA training center is orthopedic surgery, specifically hand surgery.

How were you involved in the training center's daily routines/activities?

I occasionally assisted in surgical cases and mostly observed different techniques in the operating room. There were some clinical days as well but there is a great operative volume at this hospital, which allowed me to be in the operating room around 5 days a week. I also was fortunate enough to attend a meeting of the Italian Society of Hand Surgery in Florence and a focused hand anatomy course in Verona, which greatly helped my overall knowledge of hand surgery.

How many surgeries have you assisted in and what concrete technical modifications and methods have you seen?

74 surgeries. Carpal tunnel release, revision carpal tunnel release, open cubital tunnel release, metacarpal fracture plating, phalanx fracture pinning, Dupuytren's contracture release, Trigger finger release, ganglion cyst excision, TFCC arthroscopic debridement, scaphoid nonunion autologous graft and screw, PRC, second metacarpal vascularized bone flap for Kienböck's disease.

Please specify your 3 to 5 favourite procedures and/or the new skills you wanted to acquire.

CTR, CMC, scaphoid, Kienböck's, vein interposition for neuroma.

Which procedures can you potentially adopt for your future practice and how do they compare to your experiences at home?

CTR: The carpal tunnel release with a transverse incision and then passing scissors distally and proximally was a great technique that avoids a larger incision and also avoids a longitudinal incision. It is very similar to an endoscopic technique; however it does not require a long setup or any specialized equipment and is much more cost effective. CMC: The technique used at this center is to start with a first dorsal compartment release and then proceed to the trapeziectomy.

You then drill a hole through the base of the first metacarpal and pull the APL through the FPL and wrap it around before suturing it in place. The capsule is then closed and then the skin. This differs from our technique because we generally use a tightrope suspensionplasty, which is a great technique but does require a special implant and costs more.
Kienböck's: In the case I assisted with, a bone block with 1 cortex and measuring 0.5 by 0.25 mm is taken along with small artery. The lunate was burred and necrotic bone removed and then the vascularized bone flap was impacted into the defect. The capsule was not closed, as this would compromise the blood flow to the flap. The wrist would be immobilized for around 6 weeks then gradually return to full range of motion. I have never seen a procedure for Kienböck's so I am unable to compare this procedure to the procedure that we normally perform. We did not perform an osteotomy, as there was only a 1 mm variance at the distal radioulnar joint and this was equal to the unaffected side.

What was the most significant personal experience of the scholarship for you (e.g. cultural exchange, etc.) ?

The most significant cultural experience that I had was how welcoming everyone was and how they helped me improve my limited Italian. The staff and residents made me feel welcome and everyone was very friendly.
Also, the food was fantastic!

What organizational tips would you give to future scholarship applicants?

I definitely recommend living close to the metro as the hospital is only a nine-minute walk from Affori FN Metro station. I lived in the Navigli area and I felt very safe and was close to groceries and laundry and a metro station. I used Airbnb and received a discount because my stay was a month long and I would encourage you to look for a place that offers the same discount.
I want to thank everyone at IBRA for making this happen. The experience and lessons that I learned will help me in treating patients in my practice. I also made friends that I hope will be friends for life. I especially want to thank Dr. Lazzerini and his wife for making me feel at home and making it such a great experience! Dr. Lazzerini is a great surgeon and a great person and it was an honour and a privilege to be able to learn from him.

Second Metacarpal Vascularized Bone Flap for Kienböck's Disease (Avascular Necrosis of the Lunate)

A Case Study by Dr. Robert Walker as part of the Scholarship at the Galeazzi Orthopaedic Institute in Milan, Italy

Keywords: Kienböck's, Second Metacarpal Bone Flap, Wrist Pain, Avascular Necrosis

Kienböck's disease, or avascular necrosis of the lunate, is a rare disease usually affecting males in their 20s–40s with negative ulnar variance. The usual presentation is dorsal wrist pain in the dominant hand, which is usually activity related. We present the case of a 26-year-old female with acute onset of dorsal wrist pain. Magnetic resonance imaging demonstrated changes in the distal aspect of the lunate without cortical collapse, consistent with Kienböck's disease.
Due to the stage at which this patient presented, we elected to proceed with a revascularization using a second metacarpal vascularized flap to restore blood supply to that area.

INTRODUCTION

Kienböck's disease, or avascular necrosis of the lunate, is a rare disease usually affecting males in their 20s–40s with negative ulnar variance [(1)]. It generally presents with dorsal wrist pain, usually in the dominant hand, and is generally activity related. Physical exam demonstrates tenderness over the radiocarpal joint, with or without wrist swelling. There is generally a decreased flexion-extension arc and decreased grip strength compared to the contralateral side. The degree of disease is described by the Lichtman Classification (Stages I–IV)[(2)]. With stage I representing disease that can only be seen on MRI and is usually treated conservatively despite a high risk of progression. Stage II demonstrates sclerosis of the lunate on radiographs and may be treated with a joint leveling procedure in patients who have negative ulnar variance; radial wedge osteotomy and STT fusion in patients who are ulnar neutral; distal radius core decompression; or a revascularization procedure, depending on the present case. Stage III represents lunate collapse on radiographs and is divided into A and B, where A has no scaphoid rotation and B has fixed scaphoid rotation. Stage IIIA is treated in the same way as stage II, and stage IIIB is usually treated with a proximal row carpectomy, STT fusion or SC fusion. Stage IV progresses to degeneration of adjacent intercarpal joints and is usually treated with wrist fusion, proximal row carpectomy or limited intercarpal fusion.

REASONS FOR CHOOSING THIS CASE

Various papers have been published on the etiology and treatment of Kienböck's disease but the exact cause of the disease is unknown. Several theories as to its origin exist, including: disruption of venous outflow; lunate morphology, local vascular anatomy; negative ulnar variance; and systemic diseases such as sickle cell disease, kidney disease and cerebral palsy[(1)].

There are currently many ways to treat this condition, but no treatment option has been shown to be superior (Lutsky). As more is learned about this disease, treatment options can be developed to better address the underlying pathology.

THE HISTORICAL CONTEXT OF KIENBÖCK'S DISEASE

The first description of collapse of the lunate was described by Peste in 1843. Later, Robert Kienböck published his article on osteomalacia of the lunate in 1910[(3)]. Dr. Kienböck believed that the etiology of the disease was related to rupture of the ligaments and vessels surrounding the lunate, which then leads to fracture and collapse. Hulten associated Kienböck's disease with negative ulnar variance and was the first to suggest shortening of the radius as a treatment option[(4)].

DIFFICULTIES IN DIAGNOSIS OR TREATMENT

Radiographs do not always correlate with the patient's symptoms. The disease is often progressive and does

not usually respond to conservative treatment; however, prognosis is better in pediatric and elderly patients than in the typical 20- to 40-year-old patient.[5]

INFORMATION ABOUT TREATMENT AND DIAGNOSIS

The condition can present in any patient; however, the most typical patient is a male in his 20s–40s, who has negative ulnar variance, loss of grip strength compared to the unaffected side and generally has no history of trauma. The presentation is usually unilateral, although it can be bilateral (Kahn) with dorsal wrist pain and swelling over the lunate.

The diagnosis is made radiographically although in stage I[5] of the disease, radiographs will be normal and MRI will show some signal intensity changes.

Radiographs will demonstrate lunate sclerosis, collapse of the lunate articular surface and midcarpal arthritis as the disease progresses. Radiographs are also useful for demonstrating ulnar variance, radial inclination, carpal height, radioscaphoid angle, and lunate size and morphology.

Despite there being no superior treatment at this time, 72–92% of patients improve with surgical treatment compared to 63% of non-operative patients. Surgical versus non-operative treatment is controversial, as one study[6] concluded that Kienböck's disease is progressive despite the study being retrospective. Another study[7] compared surgical versus non-operative patients with Kienböck's and found that the surgical patients lost more motion, had a greater change in social activities and gained only a small amount of grip strength compared to non-operative patients. A study investigating radial shortening demonstrated a slowing of the disease process compared to non-operative treatment[8].

Despite conflicting reports on surgical or non-operative management, it is generally agreed that a trial of non-operative management with supportive treatment and immobilization should be the first course of action [9] [10]. If non-operative treatment fails, then a surgical treatment is generally pursued. The choice of treatment is largely based on the stage of the disease and the anatomical variations present, such as radial inclination and ulnar variance.

Our patient had stage 2 disease and neutral ulnar variance. The goal of the surgery was to restore blood supply to the lunate. This can be accomplished through a vascularized pisiform transfer, vascularized pedicle transfer from the distal radius, vascularized bone graft from the metacarpal or free vascularized grafts. If our patient did have negative ulnar variance, then capitate shortening or radius osteotomy may have been appropriate to perform in conjunction with the revascularization procedure. Other procedures that have been performed for Kienböck's disease include the 4–5 ECA (Moran), in which 71% of lunates revascularized but 23% progressed; vascularized pisiform[11] with 33% progression; use of free vascularized iliac crest, in which 16 out of 18 patients had no lunate collapse at 13 years follow-up; as well as radial shortening[8].

Galeazzi Orthopaedic Institute – Hand Surgery Unit

Milan, Italy
Fellowship Director: Dr. Alberto Lazzerini

The Hand Surgery Unit at the Galeazzi Orthopaedic Institute is a certified hand center of the Italian Society for Surgery of the Hand. Traditional, arthroscopic and advanced microsurgical techniques are currently employed for the treatment of conditions in the following fields:

- Fractures of the hand and wrist
- Carpal instability
- Hand trauma and microsurgical reconstruction
- Primary and post-traumatic degenerative joint disease and deformity
- Peripheral nerve compression and injury
- Rheumatoid arthritis
- Congenital deformities

Clinical research protocols are currently in progress in several areas of interest.
The Institute is located in the north area of Milan, it is connected to the center of the city by regular public transport service and is easily accessible by main roads. The area offers several accommodation facilities in close proximity to the Institute.

Case Report Procedure

A 28-year-old woman with a few weeks of left dorsal wrist pain. The patient's pain was mostly activity related.

The patient (28-year-old female) presented with a 3-week history of left dorsal wrist pain that did not respond to conservative treatment. Radiographs demonstrated cystic changes in the lunate on 2 views of radiographs. Advanced imaging with MRI was undertaken and demonstrated findings consistent with avascular necrosis of the lunate. The distal radioulnar joint was neutral therefore a radial shortening procedure was not undertaken. With the lack of collapse of the lunate, we discussed treating the patient with a revascularization procedure and the patient agreed. The patient underwent the procedure under a regional block and tolerated it well. She was placed in a volar splint for 2 weeks and followed up in clinic for a wound check. Then she was immobilized for another 4 weeks. At the 6-week-follow-up she started range of motion exercises. At the most recent follow-up (6 months), the patient was doing well with full range of motion and strength compared to the contralateral side.

Management and Outcome
Second dorsal metacarpal artery flap revascularization procedure. Full range of motion and strength compared to contralateral wrist.

Care received by the patient:
Treatment
Second dorsal metacarpal artery flap revascularization procedure.

Hospital stay
The patient was discharged on post-operative day zero.

Duration of post-operative treatment
The patient will undergo 6 weeks of immobilization.

Improvements during treatment
The patient now has full range of motion and strength compared to the contralateral side.

Reasons the treatment was stopped or failed
Treatment has been a success thus far.

Pre-operative imaging:

Fig. 1
AP left wrist demonstrating cystic changes to the lunate

Fig. 2
Lateral wrist demonstrating cystic changes to the lunate without collapse

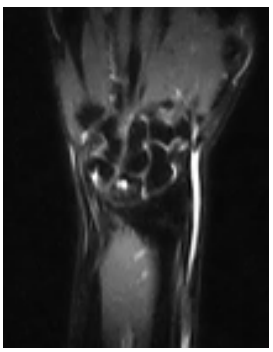


Fig. 3
MRI coronal views – two T1 demonstrating lack of signal in the distal aspect of the lunate and one T2 coronal image of the wrist demonstrating increased fluid in the distal lunate

Post-operative imaging:

Fig. 4
Lateral radiograph immediate post-operative with vascularized second metacarpal bone graft in place and scaphoid pinned to capitate and hamate to prevent rotation

Fig. 5
AP radiograph immediate post-operative with vascularized second metacarpal bone graft in place and scaphoid pinned to capitate and hamate to prevent rotation

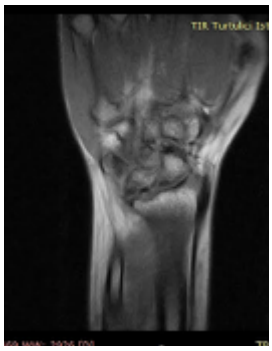


Figure 6
MR T1 coronal demonstrating incorporation of the vascular bone graft to lunate

Fig. 7
AP view wrist demonstrating incorporation of vascular bone flap

Fig. 8
Lateral view wrist demonstrating incorporation of vascular bone flap

Discussion of the case

The treatment of Kienböck's disease is as complex as its etiology. Early in the disease process, the goals are for conservative care despite a high rate of progression of the disease. If conservative care fails and the disease is in the early stages, an attempt at a joint leveling procedure (if there is negative ulnar variance) can be pursued. The goal of reestablishing blood flow to the area of avascular necrosis can be accomplished through a core distal radius decompression or various vascularized bone flaps, as was the case in our patient (Second metacarpal dorsal artery flap). The results of this procedure will be satisfactory in around 70% of patients. Salvage procedures, such as a proximal row carpectomy, can be performed; however, if the proximal capitate is arthritic, an interposition arthroplasty or some other procedure to ameliorate the degenerative changes will need to be taken. Overall, this is a complex disease but there are various treatment options found in the literature although there is no agreed-upon superior treatment.

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COURSE OVERVIEW 2021

EUROPE
15 x Head
14 x Upper Limbs
12 x Lower Limbs

NORTH AMERICA
3 x Upper Limbs
3 x Lower Limbs

LATIN AMERICA
1 x Head
5 x Upper Limbs
2 x Lower Limbs

ASIA-PACIFIC
1 x Head
2 x Upper Limbs
3 x Lower Limbs

Modified distal radius osteotomy with volar plate fixation in Madelung's deformity

Andrea Leti Acciaro, Mario Lando, Roberto Adani

INTRODUCTION

Madelung's deformity is a cluster of anatomical changes in the wrist and forearm resulting in shortening and bowing of the distal radius, curving in a volar direction and an increasing ulnar tilt of the articular surface, with prominent ulnar dorsal subluxation and palmar sag of the hand and wrist. The carpal bones form a pyramid shape, which becomes wedged in the interosseus space and leads to an anomalous radiocarpal Vickers ligament[1] consisting of hypertrophied connective tissue. Madelung's deformity has a significant hereditary component, occurring as a result of congenital disorders such as Leri-Weill dyschondrosteosis, other phenotypes of SHOX deficiency and mucopolysaccharidosis[2,3,4]. It occurs predominantly in females and onset is mainly between 6 and 13 years of age, worsening with growth[5].

HYPOTHESIS

Dome osteotomy and Vickers ligament release[6,7,8] are indicated for considerable pain relief and improvement in appearance and function. The authors' technique, which reverses the shape of the classic dome osteotomy described in literature, was performed to achieve a better three-planar correction of the distal radial fragment. This also allowed for the addition of a reverse wedge osteotomy and bone graft into the ulnar-sided defect in case of severe deformity or for additional stability during reduction with a volar locking plate (Fig. 1).

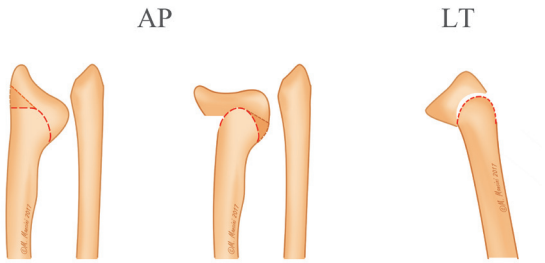

Fig. 1

MATERIALS AND METHODS

A retrospective study was carried out of 13 children (15 wrists) with the "distal radius" variant of Madelung's deformity (Fig. 2), operated on using dome osteotomy and volar plate fixation. There were 12 female patients and 1 male patient. All wrists were treated between 2010 and 2019 by personal technique of distal radius osteotomy, stabilized with locking plate and Vickers ligament release. Mean age of the children at the time of surgery was 15.6 years (ranging from 11 to 19). All wrists were symptomatic, presenting constant pain or pain and functional impairment. The mean follow-up time was 3.2 years (ranging from 3.5 months to 8 years) and evaluations were carried out based on clinical and radiological examinations.

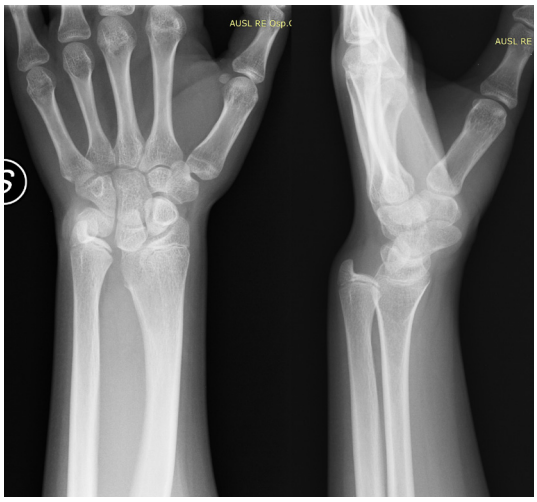

Fig. 2

SURGICAL TECHNIQUE

All patients were treated with the use of dome osteotomy with Vickers ligament release. The authors modified the original dome osteotomy technique, which is widely used in literature and was proposed by Carter and Ezaki in 2000, to reverse it in a concave proximal direction.

Most of the surgeries were performed under general anesthesia but in some children with good compliance, it was performed under a brachial plexus block with a movie on in the operating room to entertain the children[2].

The surgical incision was in all cases via the palmar approach, the DRUJ preserved and the Vickers ligament isolated and accurately released, before exposing the radial metaphysis to shape the line of the osteotomy. The osteotomy was decrescent in shape and proximally concave. The line of section was incised taking advantage of the ultrasonic microvibration of the piezo-surgery technique. The authors' modification of the original technique, reversing the shape of the dome osteotomy, was performed to achieve better three-planar correction of the distal radial fragment in extension and the radial/dorsal deviation. The proximally concave osteotomy allows for improvement of the dorsal translation of the radius and the reduction of the DRUJ. Additionally, it makes it possible to perform a reverse wedge osteotomy and bone graft into the ulnar-side opening.
In seven cases, a bone wedge was removed from the radial side to avoid impingement with the diaphysis during translation-rotation and it was then placed into the opening on the ulnar side. The three-planar correction of the distal radial fragment was secured with angular stable plates and screws. The classic volar plates are too big and the shape is not useful for dorsal rotation of the distal radius. The authors employed metacarpal plates or dorsal distal radius plates reconfigured for volar positioning and shaped in the necessary directions of the dorsal and ulnar elevations.The distal plate edge must be fixed to the distal radius almost parallel to the ulnar subsidence and the plate must protrude proximally toward the radius. The plate comes to rest distally and centrally on the radius shaft in a way that is useful for achieving ulnar and dorsal elevation (Fig. 3). No primary surgery was performed on the DRUJ, secondary ulnar surgery would be considered in light of any imminent necessities[9,10].

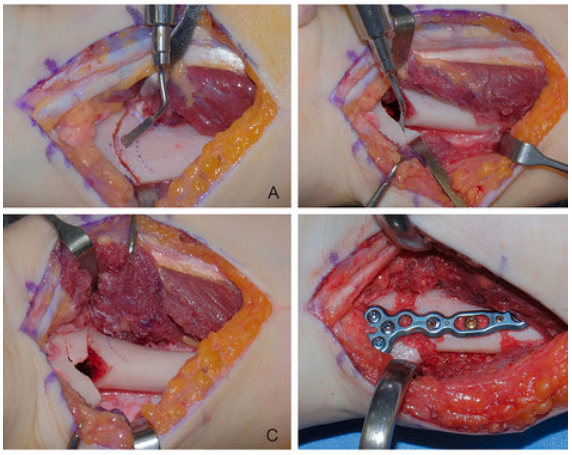

Fig. 3


Fig. 4

RESULTS

The main outcome indices were selected according to pain, wrist motion, and radiographic measurements of radial inclination, lunate subsidence and longitudinal ulnar axis[9,11]. Because of the very young age in the pre-operative stage, the measure of grasping and pinching was not a homogeneous index.
Bone union was achieved in all cases. This reversed technique prevents the need for interposition of the distal fragment cortex into the medullary canal of the proximal radial axis when greater angular correction is required. The evaluation of cosmetic deformity, functional outcomes and pain relief (VAS 0–10) was calculated according to the DASH score, presenting at follow-up a mean post-operative value of 16% (only one patient reported 35%). Pain relief was achieved in all treated cases, presenting VAS 0 at rest and mean 1.6 during activities. Only 1 patient reported pain during sustained activity. Is very interesting to note that three patients experienced recurrent pain at the shoulder due to the adaptative posture and motion in prono-supination of the forearm and wrist. The most significant improvement in ROM was detected in extension, supination and flexion of the wrist with a mean improvement of 21°, 14° and 10°. On radiographic features, the radial inclination increased by more than 15° and lunate subsidence by more than 4 mm (Fig. 4).

CONCLUSION

Relief of symptoms, increased range of motion of the wrist, articular support for the lunate and improvement in aesthetic appearance are the primary aims of surgery for patients with Madelung's deformity. Modifications to the dome osteotomy technique present advantages with regard to better correction of radial inclination and lunate subsidence, achieving a far greater dorsal and radial translation and allowing for reverse wedge osteotomies, mainly in more severe form of Madelung's deformity. This technique prevents the need for interposition of the distal fragment cortex into the medullary of the proximal radial axis when greater angular corrections are required. Synthesis using plates and angular stable screws avoids the need for grafts and allows for an early rehabilitation program and better compliance in very young patients. According to the understanding and physical development of children, the surgical treatment seems to be most useful in early adolescence. Adequate long-term follow-up of this study allows the patients themselves to feel pleased with the cosmetic correction and pain relief, and it means that functional impairment can be evaluated according to work-related criteria and not just based on an educational setting. X-ray comparisons are most definitive at adult age.

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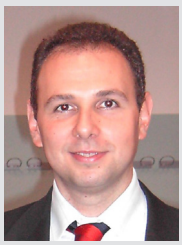

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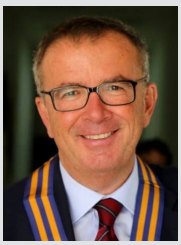

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Minimally Invasive Plate Osteosynthesis (MIPO) for Distal Radius Fracture
A Novel Approach using a New Specially Designed Implant

Gustavo Mantovani, Carlos Henrique Vieira Ferreira

INTRODUCTION

Distal Radius Fractures (DRFs) are the most common fracture of the upper extremity, accounting for 2% of all emergency room visits and one-sixth of all fractures[1]. Minimally invasive surgery is a current trend in all surgical fields, and DRFs are no exception. Nowadays, it is feasible to fix a DRF using a volar plate through a 12 mm incision providing good stability and allowing early mobility with minimal aggression to the soft tissues[2]. This way, rapid recovery, bone healing and early return to activities of daily living and work can be achieved.
Bold new solutions have been described like non-bridging external fixation, intramedullary fixed-angle devices and other percutaneous methods. All the results of these methods are good and comparable to volar locking plates[3, 4, 5, 6]. The aim of this article is show a minimally invasive plate osteosynthesis (MIPO) technique using a special volar locking plate on DRFs.

INDICATIONS

The major indication for the MIPO technique is the extra-articular reducible DRF: the classic Colles Fracture[2]. This type of fracture is the main indication for MIPO because of two important aspects: reducibility by closed maneuvers and low probability of associated injuries. After a good learning curve and increased familiarity with the MIPO approach, it can be applied to more complex fractures, including articular fractures.

TECHINQUE

The first step is the closed reduction of the fracture and radioscopic control. If it is very unstable, temporary fixation with Kirschner wires (K-wires) may be necessary. In our experience, the need to insert K-wires is very rare – they are used in very specific cases that present great instability. In this phase of the technique, good fracture reduction is very important for good positioning of the plate; however, if there are small joint fragments, these can be reduced after the distal incision is made.
After the fracture reduction, the plate was placed on the intact skin and the correct position of the implant on the distal radius was adjusted under fluoroscopy control (Fig. 1). Once we were satisfied with the positioning of the implant, we used a Codman pen to draw the implant on the intact skin (Fig. 2).

Fig. 1
Positioning of the implant on the distal radius

Fig. 2
Draw the implant

At the most distal point of the drawing, we made a transverse incision the size of the plate, approximately 1.5 cm. After the skin incision, we identified the flexor carpi radialis and the radial artery and isolated it. As in the standard approach, all dissection is performed up to the pronator. In the same direction as the skin access route, an incision was made in the pronator and with the help of a freer, we created a space between the distal radius and the muscle to accommodate the plate.

The special MIPO plate was placed between the pronator and the distal radius and adjusted under fluoroscopy control (Fig. 3). Using an aiming device, three distal screws were inserted. First, we used a long cortical screw in a central hole on the distal row of the plate to promote the close contact of the plate with the distal fragment volar cortex and then we inserted the other locking screws (Fig. 4).

The next step, taking advantage of the outline drawn of the plate at the beginning of the surgery, and of the aiming device of the plate, was to make a 0.5 cm skin incision in the direction of the oval hole of the plate. We identified the flexor carpi radialis tendon (FCR) and all the dissection was done radially to the FCR, with scissors, up to the plate. We placed a guiding sleeve for the Medartis * plate (Fig. 5) and confirmed the position with radioscopy control (Fig. 6). At this step, it is important to check that the guiding instruments of the plate has a lock , which must be properly fitted with the securing splint for the system to work perfectly. After confirming the correct position of the guiding instruments, a hole was drilled, the screw size was measured and a cortical screw was placed of the previously measured size.

Using the same proximal incision, it is possible to block the other two screws from the proximal part of the plate. To work on the most proximal one, we had to flex the wrist, position the guide instruments in the corresponding hole in the aiming device up to the plate, confirm that the system lock was tight, drill the hole, measure and place the blocked screw. In the same way, only by performing a wrist extension, the most distal hole in the proximal part of the plate was filled (Fig. 7).

We returned to the distal part of the plate and the last two blocked screws were inserted. The first cortical screw was then changed to a blocked screw. The tourniquet was deflated, suture was applied in layers and skin suture was carried out using intradermal stitches (Fig. 8).

Fig. 3
Plate is placed between the pronator and the distal radius

Fig. 4
Screw is placed in distal part of the plate

Fig. 5
Proximal guiding instruments are being placed

Fig. 6
Confirming the guide position with radioscopy control

POST-OP CARE

In the immediate post-operative period, the patient was encouraged to begin passive and active ROM in the wrist and fingers. The sutures were removed after 2 weeks and after 6 weeks, we began exercises to increase the strength and endurance of the wrist.

Fig. 7
Blocked screws are put in proximal part of the plate

COMPLICATIONS

The literature shows equivalent results for both MIPO techniques and conventional volar plates; however, the cosmetic benefit here is obvious and some comparative studies and better outcomes from the earlier evaluations have demonstrated a faster recovery([3,7,8]. Complications in both the literature and our clinical experience are equivalent for MIPO and conventional volar plate techniques.

Fig. 8
Final appearance

CONCLUSION

- Technique is easy to execute and can easily be reproduced.
- It offers excellent stability, with the possibility of early mobilization of the wrist.
- It offers bone consolidation in the perfect position, with excellent ROM, a similar rate of complications as that of the traditional technique and a superior aesthetic result.

Pre-operative imaging:

Post-operative imaging:

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Four-corner arthrodesis of the wrist using a low profile, dorsal, circular locking plate: Consolidation rates and complications.

Eduardo Vasquez, Anderson Vieira Monteiro, Daniel Tôrres Jácome, Marcelo de Mattos Carvalho, Leonardo Soares Pereira

INTRODUCTION

Four-corner arthrodesis of the wrist is one of the options in the therapeutic arsenal for the management of symptomatic wrist arthrosis and it is a type of partial fusion associated with scaphoidectomy[1-2]. This fusion can be performed through the use of several implants, such as plates, Kirschner wires, clamps and screws[3-4].
Although there has been a large investment in the modernization of four-corner arthrodesis plates on the market, studies show a significant rate of complications related to the use of these plates, such as device breakage, irritation, dorsal impact and consolidation failure[5-8].
The aim of the current study is to evaluate our experience of the rates of consolidation and post-operative complications using the APTUS Four Corner Fusion plate (Medartis), a low profile, dorsal, circular, locking plate for four-corner arthrodesis.

MATERIALS AND METHODS

The study included the review of the medical records of all patients who underwent arthrodesis in the period from January 2015 to June 2017 using the four-corner technique and the APTUS Four Corner Fusion plate performed by surgeons from the Hand Surgery Service of INTO (National Institute of Traumatology and Orthopaedics, Rio de Janeiro, Brazil). Patients had a minimum post-operative follow-up of one year. The analysis of the consolidation and possible complications of arthrodesis included clinical evaluations of the medical records, as well as evaluations of the radiographs and CT images of the wrists with the DICOM viewing software. The use of computed tomography was reserved for the cases of patients who remained symptomatic during post-operative follow-up.
The Institutional Review Board of INTO reviewed and approved the study.

SURGICAL TECHNIQUE

All hand surgeons in the service used the same surgical technique with a dorsal approach and posterior interosseous nerve neurectomy.
Capsulotomy was performed with carpal bones exposed and scaphoidectomy. When possible, the scaphoid was used for bone grafting. The cartilaginous articular surfaces between the lunate, triquetrum, capitate and hamate were removed. Afterwards, the alignment between lunate and capitate was reestablished with provisional fixation using Kirschner wires.
A dedicated reamer was then placed at the intersection of the four carpal bones to prepare the plate recess. It is important to ream the bones to such a depth so that the plate may be inserted directly beneath the bone's surface, especially for the lunate. This allows for the leveling of the dorsal lip and prevents impact during extension of the wrist. The spaces between the bones can then be filled with bone grafting.
Position the plate on the bones in such a way that at least two screw holes can be filled per carpal bone. Once the plate is positioned, the cortical screws are first inserted into the inner screw holes of the plate, ensuring that the four bones are brought closer together and pulled to the plate, avoiding their distraction. Then locking screws are placed in the outer screw holes of the plate.
After closing the skin and dressing, a glove splint completes the immobilization and remains there for 2–3 weeks.

RESULTS

During the period in study, 45 patients underwent 48 four-corner arthrodesis procedures and 3 underwent bilateral arthrodesis, 41 of whom were male (93.18%) and 4 were female (6.82%), with a mean age of 46 years (22–64 years). The reasons for performing the procedure were SNAC (scaphoid non-union advanced collapse) (79.2%) (Fig. 1 and 2) and SLAC (scapholunate advanced collapse) wrist (20.8%). Of the total number of patients, 14 (31.11%) were smokers.

Of the 48 four-corner arthrodesis of the wrist, 45 (93.75%) were successful in primary bone healing and lack of post-operative complications in relation to the implant (Fig. 3 and 4). Unsatisfactory progress due to non-union was observed in 3 patients (6.25%). Of these cases that did not consolidate, there was loosening of the implant in one patient and two continued to have pain in the post-operative period. These were investigated, revealing new radiographs and wrist CT images that were suggestive of non-consolidation.

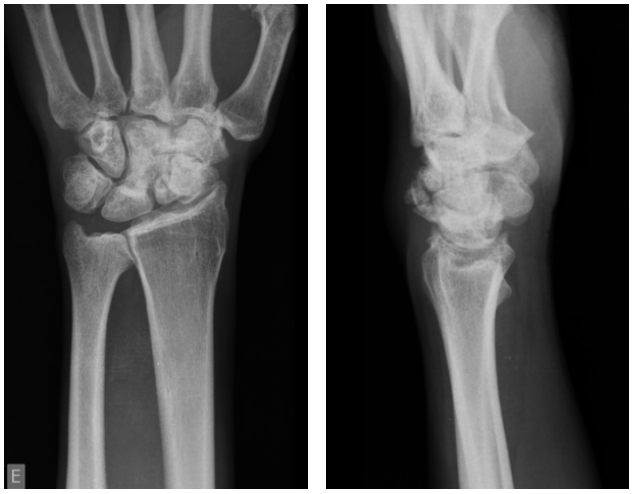

Fig. 1 + 2 SNAC wrist
Pre-operative PA and lateral x-ray image

DISCUSSION

Since first described by Watson and Ballet[1], a succession of implants has been used to perform four-corner arthrodesis. The use of Kirschner wires achieves a satisfactory consolidation rate, ranging from 84 to 97% [9–10]. However, there is a high incidence of pin migration, superficial infection and tendon irritation, which could lead to the necessity of a second surgical procedure to remove the synthesis material. Other fixation methods have been introduced, such as clamps or compression screws. Nevertheless, the reported non-consolidation rates have remained similar (1.6% to 9.7%). In addition, the incidence of dorsal impact related to the implant was frequent with the use of staples. Non-locking dorsal plates were then developed with the intention of achieving greater mechanical stability, allowing for early mobilization and improving the final range of motion. The results were very varied, with non-consolidation rates as high as 62.5% and with no improvement in the range of motion of the wrist[5-6-7].

The design of the APTUS Four Corner Fusion plate was developed based on concerns and problems found in previous dorsal plates[5-11-12-13]. This plate is characterized by its low profile (1.4 mm thick) and by having multiple screw options for fixation. During its placement, the carpal bones must be reamed. The custom-made reamer matches the shape of the plate exactly.

Fig. 3 + 4 SNAC wrist
Post-operative PA and lateral x-ray image

This reduces the amount of bone removed and allows for deeper insertion of the implant to avoid dorsal impact on the radius, which was proven to help due to the absence of this complication in the 48 arthrodesis procedures of this series. This plate (which has 2 sizes: 17 and 15 mm) allows for compression with four central holes using cortical screws, as well as eight hole options for locking screws (TriLock®), allowing the surgeon to have a great chance of achieving the best bone position for screw insertion. The cadaveric study by Krasarin et al. demonstrated that locking screws are theoretically stronger biomechanically than traditional screws[9–10]. However, the exclusive use of locking screws may not grant compression or even guarantee a fixation with the carpal bones distracted. Therefore, by allowing compression before locking fixation, the APTUS Four Corner Fusion plate will help achieve a higher rate of consolidation compared to previous dorsal plates.

Our series demonstrates that by combining screw options, i.e. cortical and locking screws, it is possible to obtain a high consolidation rate (93.75%) and prevent failure of the osteosynthesis material, even with a short immobilization period. In addition, the low profile design and the reaming that permits the implant to be inserted deeper into the carpal bones both help to eliminate one of the major problems with the previous dorsal plates, which was the impingement between the plate and the dorsal radioulnar edge.

CONCLUSION

In our experience, the APTUS Four Corner Fusion plate has a high rate of consolidation, comparable to other fixation methods described in the literature. Additionally, it minimizes mechanical complications (such as dorsal impingement) and requires a shorter immobilization period.

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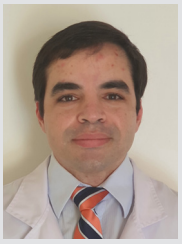

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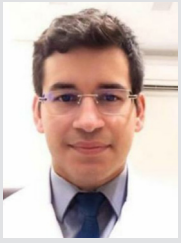

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Inducing life-like fractures in cadaveric human specimens – the new fracture simulation machine of the Department of Orthopaedics and Trauma Surgery of the University Hospital of Cologne

Andreas Harbrecht, Jutta Knifka, Nadine Ott, Kilian Wegmann, Lars Peter Müller

Steady advances in the fields of surgical specialty combined with the public's ever-increasing awareness of surgical competence raise the bar for professional education. As in any surgical field, this is also true in orthopaedic trauma surgery. Educating trauma surgeons is complex, consuming time and financial resources, as besides lectures and theoretical items, many manual and practical skills also need to be taught to the future surgeons[1]. Yet, it is not only future surgeons who need education, but also surgeons who have already finished their training. All surgeons should frequently inform themselves about newly developed techniques and implants in order to further specialize themselves[2-4]. Various concepts to enhance surgical training have been introduced. The most common ones in orthopaedic trauma surgery are artificial bone samples that closely reflect the human anatomy. These samples can be fractured artificially by an osteotomy and fracture pieces are held together by tape. These specimens are not truly realistic, as they lack a soft tissue envelope.

More realistic samples are human cadaveric specimens. These models are often used for training of surgical approaches, rather than osteosynthesis, as no realistic fracture production procedures have yet been discovered. Ligaments, nerves and blood vessels can be dissected but reduction and fixation techniques, which represent the most demanding aspect of trauma surgery are lacking. Specimens with life-like fracture patterns would allow surgeons to have realistic training on these steps.

The fracture machine of the Department of Orthopaedic and Trauma Surgery at the University Hospital of Cologne has been upgraded to induce even more suitable realistic fracture morphologies around all larger joints of the human body. No damping mechanisms that exceed the damping effects of the specimen itself are needed whatsoever.

The portfolio of producible fractures ranges from mandibular fractures involving the lower jaw, midface fractures according to Le Fort II classification, proximal humerus fractures, finger fractures to the acetabular, femoral neck, pilon fractures and many more. The fracture production technique for complex intra-articular distal radius fractures has recently been published by our group[5].

The latest additions to the portfolio consist of realistic multi-fragmentary lower jaw head fractures and high-energy midface trauma (Fig. 1). These fracture morphologies form the basis of CMF trauma courses. The portfolio has also been expanded around the hip. As femoral neck and pertrochanteric fractures are among the most common fractures and society is aging, leading to an increased incidence of osteoporotic fractures, the realistic practice of such fracture-specific fixation techniques in a safe, non-harming environment is crucial to improve post-operative outcomes of subsequent real patients[6-8].

Proximal femur fractures can be achieved in our machine by introducing the axial force via the erected and adducted femur between 10 and 20 degrees. 10° adduction leads to a pertrochanteric fracture and 20° adduction to a femoral neck fracture. The specimens were cut with an industrial saw at midshaft level of the femur on both sides and an additional cut was performed at the level of lumbar vertebra body 3 in order to fit into the machine. Acetabular fractures are certainly among the most difficult fractures of the human body to operate on, combined with a high approach-related morbidity[9]. With the new generation of our fracture machine, we have succeeded in producing realistic acetabular fractures (Fig. 2)[10].

The contemporary mechanism of fracture production is performed by a falling test bench, which is displayed in Fig. 3. We use a drop weight that is guided by two bars. The drop weight hits with the desired kinetic energy onto an impactor that is guided into two holes in a crossbeam. The impactor therewith is driven into the specimen that is – depending on the anatomical region – fixed in specific positions below the impactor. The impact leads to a shortening or compression of the specimen. Dampers are not used. The amount of shortening of the specimen is only limited by the amount of applied energy itself.

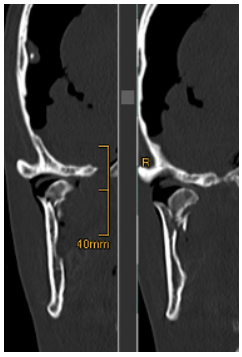
The current mechanism allows for a shortening of 121 mm. All fractures can be induced in formalin-fixed specimens or, even more realistically, in fresh-frozen specimens. Cadaveric models remain the benchmark in realistic surgical training before operating on living patients.

As technical improvements are frequently being introduced to the market and sub-specialization becomes more and

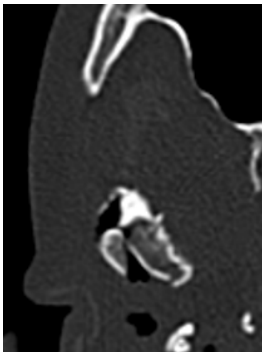
more necessary to guarantee an up-to-date treatment, every surgeon needs to continuously train on demanding and realistic exercise models. Surgical courses on cadaveric specimens are therefore the ideal course system to provide a significant amount of realistic teaching.

All new fracture morphologies created by the new generation of our fracture machine have been or are planned to be implemented in trauma surgery courses. The evaluation of such courses, as recently published by our group, profoundly enhances surgical training[11].

Fig. 1:



a) CT-scan coronary plane of a multifragmentary lower jaw head fracture

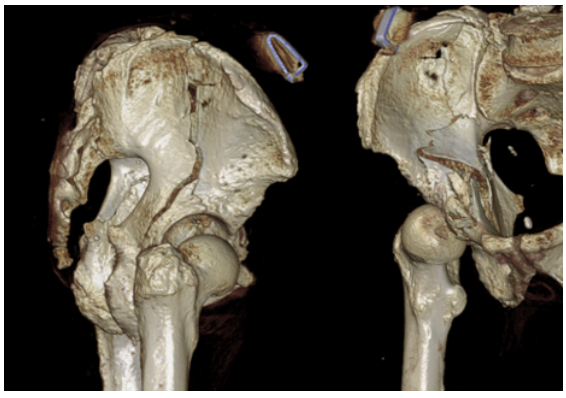


b) Axial plane of the aforementioned fracture

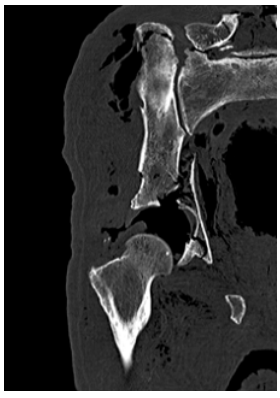
c) 3D reconstruction with medial lower jaw fracture and multifragmentary lower jaw head fracture, right

d) 3D reconstruction of a multifragmentary midface trauma Le Fort II and multifragmentary lower jaw fracture

Fig. 2:

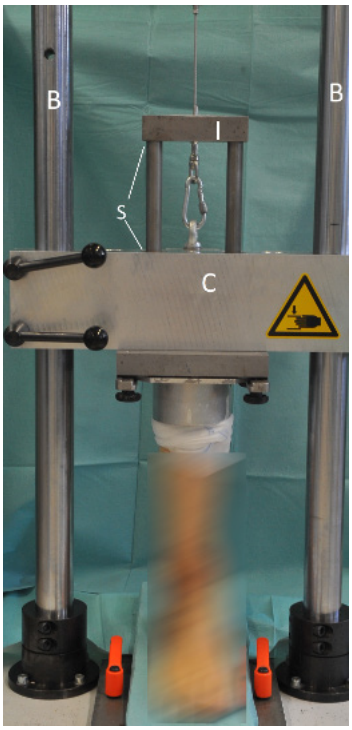


a) 3D reconstruction of a multifragmentary acetabular fracture on the right side of the specimen with involvement of both columns according to Letournel



b) Coronary reconstruction of the aforementioned fracture in the center of the acetabulum

Fig. 3:



New generation fracture machine with a fixed lower leg for pilon fracture simulation; B = guiding beams, I = impactor, C = crossbeam, S = maximum of potential shortening = 121mm

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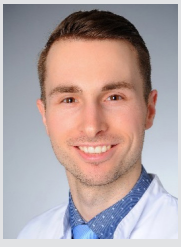

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