Focus on  
The REVISION Stem in the U.S.

As announced in Lima News no. 11, Lima Corporate and DJO Surgical have signed a cooperation agreement whereby certain selected Lima products will be marketed in the United States under the DJO Surgical brand. Things have moved on quickly since the agreement was signed and the first Lima product has now been registered in the United States. Last March the REVISION stem, used for hip revision surgery, got the FDA approval. 

Having achieved registration, plans were made for the roll out of the product’s commercial launch. First, training sessions were organized for selected American surgeons at Lima’s Referral Center in Italy. DJO-selected surgeons had the chance to receive training on the REVISION stem by attending in the operating theatre and exchanging views and experience with their Italian colleagues. 

The REVISION stem implants have started on the U.S. market in October 2010. Below is a case report of one of the first operations performed by Dr. Joseph Fetto.

Michele Piovani  
Business Development Director  
Lima Corporate

This is a revision THR for recurrent traumatic dislocation of a 22mm cemented Charnley prosthesis. The patient is a 64yo female, with rheumatoid arthritis, who is 24 years after a cemented acetabular and femoral monoblock components for inflammatory osteoarthrosis. She had suffered 5 previous dislocation, the most recent of which required an open reduction and repair of soft tissues.

She presented this time, after suffering from a slip and fall, with an irreducible dislocation of the THR (Fig. 1), with a moderately unstable hip. The femoral osteotomy to facilitate removal of the well fixed femoral component was performed. 

Anteversion of an acetabular component is often difficult to ascertain in THA patients in whom excessively anteverted or retroverted femurs may result in limited ROM or risk of dislocation. Restriction of motion, however, is determined by the combination of version of both components.

The patient shows cup loosening in Gruen zone III. This situation can occur when the initial press-fit is not adequate, the bone quality is poor, and when socket stability relies on the polar screws.

The cranial migration of the rotation hip center is associated with an increased angle of inclination of the cup and, as in this case, there is a dislocation of the prosthetic head due to the action of the abductor muscles.

The surgeon, seeking the greatest amount of host bone, must restore the anatomical level of the hip center and ensure that the cup provides adequate coverage of the prosthetic head, with both angle of inclination and anteversion in line with this objective.

Also, it is of paramount importance to obtain the appropriate combined anteversion (anteversion angle of the socket plus anteversion angle of the stem), which should not exceed 30 degrees to ensure the stability of the joint in revision cases (Matsushita A, et al. Clin Orthop Relat Res, 2010).

The Lima REVISION System, including both the DELTA-REVISION TT cup and the REVISION stem, easily solves the two most important issues in the case report: 1) detect in the acetabular roof (Paprosky IIC) and 2) joint instability.

The DELTA-REVISION TT cup allows a Trabecular Titanium™ augment to be added on the top by means of small screws. This augment perfectly fits the defect in the host bone and leaves the liner in the correct orientation. The lower hook and upper fin tightens the cup host bone, providing adequate stability. However, since the cup may be conditioned by the defect, this must be compensated on the femoral side to avoid joint instability.

The surgeon can choose any degree of neck-anteversion thanks to the modular REVISION stem. Furthermore, the 4-degree slope at the trunnion formed by the two stem-components (diaphyseal and metaphyseal) can also direct the metaphysis in flexion, extension, varus or valgus depending on the most appropriate position for each case. The different sizes of the proximal component ensure the correct leg length.

Dr. J. Fetto  
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Combined Anteversion Angle and Stability in Hip Revision Surgery

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Dr. X. Gallart  
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For additional information, please visit:  
www.secot.es/Menus/Grupos-de-Estudio/Cooperacion.aspx
The C2 Stem

We have a few questions about our C2 stem to Dr. Christian Jager, an orthopedic surgeon with 20 years’ experience in prosthetic surgery and currently Head of Orthopedics and Traumatology Department at the San Rocco Clinical Institute in Ome, northern Italy.

Dr. Jager, how long have you used the C2 stem and what type of cases do you select it for?

We started using the C2 stem in 2000 and have now implanted about 700 implants, mostly joint replacement cases, carried out by me and my team, made of Dr Giuseppe Savitri and Dr Antonio Scotta.

What in your opinion are the advantages of the C2 stem philosophy?

We chose the C2 stem mainly for its primary and long-term stability thanks to the fixation given by its wedge shape, for the substantial and well-documented osseointegration generated and the high implant survival rates, as reported by numerous national and international studies.

What surgical indications would you recommend it for?

The C2 stem is an extremely versatile implant and so we use it in our daily practice not only for primary hip replacement cases like osseolysis, osteonecrosis, fractures etc., but also for simple dysplasias when there is no extraction of the antero- or retroversion of the femoral neck, as well as for GRADE 1 and sometimes even GRADE 2 SIR-Classified revision cases.

Do you think the introduction of the tapered neck has helped to increase the BROM?

Yes, absolutely. There’s no doubt that the tapered neck profile has further reduced the risk of joint impingement, with a ROM gain of around 20%.

Does the blunt rounded distal tip also help to reduce thigh pain?

My answer is without doubt yes!

Do its double conical shape and the proximal geometry of the stem eliminate the risk of subsidence reported in the literature for stems with the same underlying philosophy?

We have never encountered the phenomenon of subsidence not even in cases of fracture of the proximal femur in elderly patients with severe osteoporosis.

Has the introduction of the lateralized version been useful?

If so, in what cases?

The introduction of the lateralized version with the neck at 124° was, I would say, a logical and necessary development to allow management of special cases like coxa vara and coxa protusa, and joint instability due to inadequate muscle tone etc.

What sort of tribologic bearing do you prefer with the C2 stem?

In our daily practice, the lion’s share, some 60%, undoubtedly goes to the polyethylene-metal bearing while polyethylene-ceramic accounts for 25% and ceramic-ceramic-bearing accounts for 15%; this latter option is reserved for biologically “younger” patients.

Do you think your instrument set with modular broaches is of help when choosing the stem intraoperatively?

The wide modular variability of the broaches means you can be very precise in selecting the correct implant size, furthermore reducing operative time considerably.

Given your vast experience, what advice would you give to your colleagues approaching this philosophy?

What do you mean by vast experience? No one is ever through with learning. What I would advise, especially young colleagues using this stem for the first time, is to give a lot of time to the learning curve. It’s apparently easy to use but really requires great precision and manual dexterity. Once you’ve become comfortable using the stem, you realize how versatile it is and how it can be used universally. Last but by no means least, there is the excellent cost-benefit aspect.

Dr. Christian Jager
Istituto Clinico San Rocco
Ome - Brescia

Modular Femoral Component And Double Mobility Cup: The Lima H-Max and 2M Concept

INTRODUCTION

When we insert one of our implants, what we are all seeking to achieve is a biomechanically optimal restoration of the hip joint. But currently there appear to be three major problems to be overcome:

• the long-wise symmetry of the two lower components;
• ensuring hip stability and eliminating the risk of dislocation: finding the right relationship between the position of the cup, the femoral stem and the implant neck is the number one factor for good hip stability;
• restoring the correct tension of the soft tissues, with a view to restoring the offset, by combining the orientation and length of the neck and the length of the head.

Modular hip implants are a useful tool for dealing with such challenges. We have tried to adapt implants to the hip anatomy of which the extra- and intra-osseous variability are well known.

A modular approach offers surgeons a wide range of options when selecting implants. At the femoral level, it may be necessary to vary the length and orientation of the implant neck to reproduce the same conditions as the natural joint.

The growing trend towards modularity goes hand in hand with a higher risk of a mismatch between the prosthetic components and a possible limitation to the range of joint motion. The most important risk, however, remains an increase in the amount of metal debris and greater polyethylene wear over the long term.

This risk can be reduced by adopting important elements such as the design of the H MAX implant, the choice of a double mobility 2M cup (for patients over 75 years of age), and the pre-operative planning.

Double mobility systems are unquestionably interesting. In both joints, the aims are similar:

• reduce wear
• minimise the risk of loosening
• restore the original physiology and anatomy as much as possible
• enhance intra-prosthetic stability

The rationale for the double mobility cup was to merge the benefits of two quite different systems, i.e. combine lower PE wear, according to the “low friction” principle described by Charnley, with intrinsic joint stability by re-implanting a “femoral head” of a similar size to that of the patient’s original anatomy, according to the McKee-Farrar principle.

In point of fact, each articulation level of the double mobility cup incorporates the advantage of one of these two systems, combining reduced intra-joint constraints with mechanical hip stability.

Thus the 2M cup appears to meet the initial aims of the double mobility concept: low friction helps to reduce constraints, and thus a more durable bond subject to less stress, and to reduce polyethylene liner wear, whilst the greater diameter of the mobile insert ensures greater intra-joint stability, approaching the patient’s natural physiology.

TECHNICAL CHARACTERISTICS

The double mobility system is comprised of a cementless Lima 2M cup lined with a mobile polyethylene insert. Thus there are two concentric articulations:

• the femoral head, articulating within the concave polyethylene liner the “small” articulation;
• the convex articulation of the liner within the metal cup: the “large” articulation.

The metal cup is cylindrical-spherical. This complex shape further
enriches the stability of the double mobility system. The peculiar cup shape permits a wide range of femoral neck excursion, and also enhances coverage in the upper quadrant. Depending on the implant size, the polyethylene liner represents about five-eighths of the sphere. It always features a femoral head retention device, so the prosthesis head should be pressed firmly into the liner. Of course, if both articulations were fully and independently mobile, the risk of wear would be very high. However, in practice, the two articulations are independent only in the static phase (hip joint unloaded), and are highly dependent on one another in the dynamic phase (loading and moving). The double mobility concept considerably reduces the shear forces induced by the friction coupling, since the main friction coupling is that of the “small” articulation, whilst the other coupling is partly absorbed by the “large” articulation; ultimately, the friction coefficient at the bone-cup interface is minimal.

POST-OP

Dr. J. C. Durand
Clinique St. Charles Lyon - France

Human Adipose-Derived Stem Cells (hASCs) Proliferate and Differentiate in Osteoblast-Like Cells on Trabecular Titanium Scaffolds

Giulia Gastaldi1, Annaia Asti2, Manuela Federica Scaffi3, S. Benazzo2,3.

ABSTRACT

The use of stem cells in regenerative medicine is an appealing area of research that has received a great deal of interest in recent years. The population called human adipose tissue-derived stem cells (hASCs) share many of the characteristic of its counterpart of marrow including extensive proliferative potential and the ability to undergo multilineage differentiation along classical mesenchymal lineages: adipogenesis, chondrogenesis, osteogenesis, and myogenesis. The aim of this study was to evaluate with biochemical and morphological methods the adhesion and differentiation of hASCs grown on Trabecular Titanium scaffolds. Then hASCs isolated from subcutaneous adipose tissue after digestion with collagenase were seeded on monolayer and on Trabecular Titanium scaffolds and incubated at 37°C in 5% CO2 with osteogenic medium or control. The culture media were collected from subcutaneous adipose tissue after digestion with collagenase and subcultured for five times in osteogenic medium or control. The cells were then digested with trypsin and seeded on monolayer and Trabecular Titanium scaffolds and incubated at 37°C in 5% CO2 with osteogenic medium or control.

CONCLUSIONS

If implant conditions are respected, this combination of modularity and double mobility can achieve excellent functional results, especially the avoidance of dislocation. The confidence that this approach generates helps the surgeon in the post-operative period: with few exceptions, most are spared the anxiety of having to deal with dislocations; patients also gain benefits, insular as their hospital stay is likely to be shorter, their rehabilitation faster and their return to everyday life smoother.

POST-OP

Dr. J. C. Durand
 Clinique St. Charles Lyon - France
The design of external fixators for the repair of fractures of the hand is mandated by the need for simplicity of reduction that respects the anatomy adjacent to the bone. Although less invasive, K-wire fixation does not always provide sufficient stability to permit early mobilization and hence functional rehabilitation. In addition, the surgeon has to work in limited areas making sure to preserve the hand’s anatomical balance.

Materials and Methods
Since the 1980s our Orthopedic Division and subsequently our Hand Surgery and Microsurgery Unit have employed external fixation systems to manage traumas of the hand. The system most frequently used is the SEM (the Modular External Stabilizer), designed specifically for the hand and employing both trans-skeletal threaded pins or simple K-wires. As a result, the SEM system can be used as means of reduction and fixation or as a stabilizer after minimal fixation with K-wires, in both cases allowing early joint mobilization.

The modular system also enables skeletal lengthening procedures even in segments less than 2cm long. The system was formerly constrained by the excessive mobility of the clamp and threaded rod assembly, which given the very small size of the clamps, proved difficult for surgeons to manipulate easily. Surgical outcomes reported in the literature were, however, always positive. The system has recently been revised becoming more user-friendly while keeping all the distinctive features of the SEM system.

In particular, the clamps are still designed to hold both trans-skeletal self-threading pins or simple K-wires of either equal or different size. In addition, compression and distraction can be obtained simply by engaging the threaded rod or creating an arc linking the threaded rods to form a bridging or delta frame, a technique used both in lengthening procedures as well as to maintain alignment in cases of massive bone loss. The SEM II has been employed to manage all kinds of phalangeal and metacarpal fractures and allows early mobilization. Fracture osteotomy-site healing have always achieved.

Results
Average consolidation time is 4 weeks for metacarpal fractures, 6 weeks for phalangeal fractures and 3 months for lengthening procedures up to 2 cm. Patients without complex trauma resume their daily activities within 48 hours of surgery.

Conclusions
External fixation systems are a valid solution in the management of hand fractures. The possibility of using self-tapping pins or simple K-wires is key to maintaining the structural anatomy and allowing early mobilization and so early rehabilitation. In conclusion, we underline the importance of SEM II in the management of corrective osteotomies since the system allows progressive post-operative realignment over time.

References
Guarini R., Busiatti P. La fissazione esterna nelle patologie traumatiche della mano, 30(2): 195-203, 1993

Dr. R. Mele, Dr. R. Turrini
Azienda Ospedaliera “Santa Maria degli Angeli”
Dipartimento Chirurgia Specialista
Pordenone

Ore 16.00 - Sala Bramante 8-9
L’UTILIZZO DELLA CERAMICA DELTA NELLE ARTROPROTESI DI GINOCCHIO: RISULTATI PRELIMINARI A 2 ANNI
D. Tigan, N. Rani (Siena, ‘Bologna’)

Mercoledì 24 novembre
Ore 10.12 - Sala Bramante 8-9
NOSTRA ESPERIENZA CON LA CERAMICA NELLA CHIRURGIA PROTESECA
S.M.P. Rossi, L. Piovarli, L. Perticarini, F. Benazzo (Pavia)

Ore 10.25 - Sala Michelangelo
DILØPS: NUOVO CONCETTO DI SINTESI “A VITI DIVERGENTI” PER LE FRATTURE PERTROCANTERICHE
P. Palombi, A. Palombi (Roma)

Ore 14.00 - Sala-banner 1-2
SVILUPPO DI UNA PROTESI DEL GINOCCHIO DI NUOVA CONCEZIONE CON ROLLGELT FISIOLOGICO.
FONDAMENTA BIOMECCANICHE E RISULTATI CLINICI DOPO DUE ANNI

Superspecialistica
Sabato 20 novembre
Associazione Italiana Riproduzione (A.I.R.)
17.10 - Sala Tiziano 3
LA REVISIONE DELLE PROTESI INSTALLABILI
D. Petriccioli (Brescia)

Dominiaca 21 novembre
Società Italiana di Patologia dell’Apparato Locomotore (SIPAL)
10.05 - Sala Bramante
LE FRATTURE PERIPROTESICHE DI ANCA
P. Palombi, D. Palombi (Roma)

Events

Upcoming Events
November 4-5
Napoli International Shoulder Course
Napoli, Hotel Royal Continental

November 5-6
11 ACOTI – La Fratture esposte – Le fratture del collo del femore
Termoli – Agrigento – Napoli

November 5-6
APSA 10th Triennial Congress
Tapez – Taiwan

November 6
SOTOP: “L’inchiudimento endomidollare”
Taroni

November 8-11
80° SOFICT
Perg – Francia

November 10-11
Corso “Chirurgia Protesica del GinoCASO”
Istituto Orthopedico Gauercone – Milano

November 13-15
42° SBOT Congress of the Brazilian Orthopaedic and Trauma Society
Brasilia – Brasile

November 20-24
80° SBOT
Marriott Park Hotel – Roma

November 25-27
EPOST 2010 – European Federation Orthopaedic Sports Traumatology
Square Brussels Meeting Centre – Brussels

November 26-27
EPOORT EC – Fast and Arka
Ginebra – Svizzera

December 1-2
IV Edizione Roma Spine
Circo Stadio F. Peder’s Hotel – Roma

December 3-4
47° Congresso ALOTTO
Rho – Milano

December 13-15
Corso di aggiornamento Chirurgia Protesica dell’Arto Inferiore
Bologna

December 16
Congresso Regionale ASOTTO
Rovigo

Briefly
ICSESS Congress, Edinburgh, September 5-8, 2010

ICSESS Congress - Lima Corporate Symposium