

Medical Scientific report

Short visit scholarship to the Foot and Ankle surgery unit, University Hospitals of Canary Islands

These are the highlights of the short visit scholarship to Orthopaedic surgery department, University Hospital of Laguna, Canary Islands From 17th to 25th of April 2017.

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Introduction

In the upcoming few pages, I will try to summarize the clinical and academic experience I have been through during my short visit to the Orthopedic Department at University hospitals of Laguna, Tenerife, Canary Islands.

Professor Mario Herrera was the organizer and the guide through the whole visit; I hereby thank him for the hospitality, and his endless effort to make each part of the visit fruitful. From the first hour of arrival, we started the scientific and clinical journey by attending the foot and ankle outpatient clinic, and then the program on the following days was very rich. The whole staff was very welcoming as I attended their morning meetings and briefings, pre-operative and post-operative discussions, trauma and casualty decisions making discussions, and even the mortality and morbidity overview of the week.

The experience there can be divided into 3 parts Trauma, Adult reconstruction and Foot and Ankle surgery.

Adult reconstruction (Total Hip arthroplasty- Total Knee Arthroplasty)

The Arthroplasty unit at University hospital of Canary Islands adopts the concepts of the Fast-track arthroplasty. The goals of the program are to shorten the hospital stay, to decrease morbidity and mortality and to achieve faster functional milestones. The fast-track arthroplasty allows early weight bearing, two to three hours after surgery, which necessitates effective analgesia to allow for it. The patient has to be motivated and the staff has to be available for patient support.

The main factors implemented in the fast-track technique are effective analgesia, early mobility, deep venous thrombosis prophylaxis (DVT), and proper discharge protocol. Pain alleviation is crucial to encourage the patients to come out of their beds. The multimodal opioid sparing pain treatment is employed based on the synergism between paracetamol and COX-II inhibitors, and opioids are spared as a rescue medicine depending on the pain intensity. Early mobilization is the cornerstone of the fast-track regimen. It allows for better prophylaxis against thromboembolic disorders, however, chemical prophylaxis with anticoagulants is still used. Appropriate hydration intra and post-operative is another key point in DVT prevention. The early mobility needs the patient to be well prepared preoperatively, physically with muscle strengthening programs, and psychologically with counseling.

Trauma:

Although the main purpose of the program is foot and ankle surgery, I had the chance to monitor some of the trauma patients during the visit. The first case was a young male, 32 year old, high energy trauma presented with knee dislocation, tibial plateau fracture Schatzker type IV.(Fig 1) The patient was generally stable. The decision was made for temporary Hoffmann external spanning fixator (7-10 days), (Fig 2) to allow soft tissues healing, and to maintain tension and alignment. Then the patient will have an open reduction and internal fixation (ORIF) with double plating and cannulated screws.



Figure 1 Tibial plateau fracture: Fracture of the tibial plateau Plain X-ray AP view (right) Lat. view (Middle) and Coronal CT (left)



Figure 2 Spanning external fixator: Immediate postoperative photo showing spanning external fixator for the knee dislocation and tibial plateau fracture

The second case was a 68-year-old woman, with a basicervical intertrochanteric fracture of the proximal femur. The patient underwent Minimal invasive ORIF, under fluoroscopic imaging, and using Gamma nail with anti-rotational screw. (Fig 3,4)



Figure 3 proximal femoral fracture: Left hip AP plain X-ray showing basicervical proximal femoral fracture



Figure 4 fracture reduction and fixation: Intra-operative fluoroscopic image showing fracture reduction with the help of traction table and fixation with Gamma nail and ant-rotation screw right: AP, left: axial.

The third case was a proximal humeral 3-part fracture. A male patient who was 52 year old. The patient had minimally invasive open reduction under fluoroscopic guidance and non-absorbable sutures stabilization. (Figs 5,6)

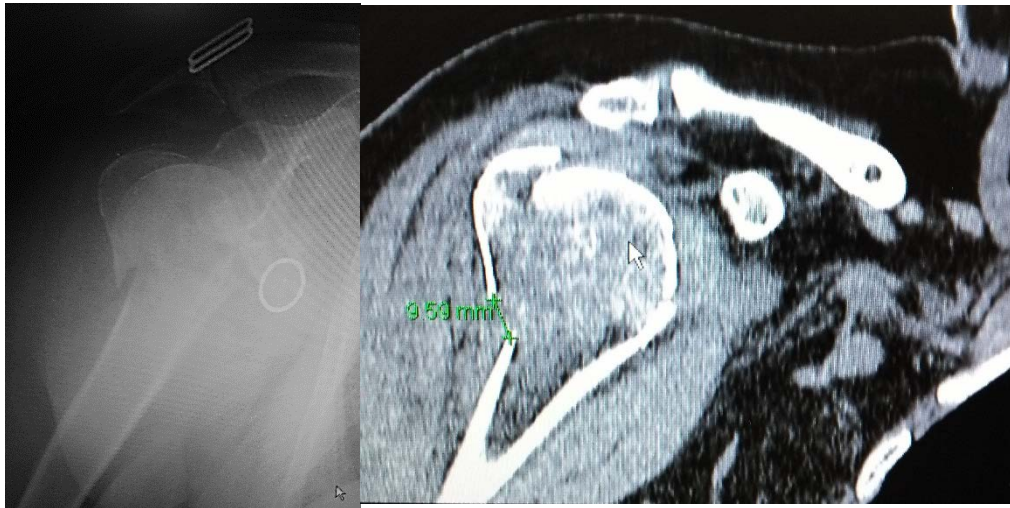


Figure 6 Proximal humeral fracture: Plain X-ray (left) and coronal CT (right) showing three part proximal humeral fracture with postero-superior displacement of the greater tuberosity and valgus impacted head.



Figure 5 Proximal humeral fracture reduction: Intra-operative fluoroscopic image showing the final reduction of the three part humeral fracture with fixation with non-absorbable radiolucent sutures

Foot and ankle:

During this visit, it was feasible to attend three foot and ankle outpatient clinics (OPC), one ward round, one preparatory discussion for the upcoming surgeries and two surgical lists. The whole number of patient examined at OPC exceeded 60 patients. I am going to report and highlight some of the encountered cases during the visit with stress on the practice broad lines.

Hallux valgus (HV):

In the department variable procedures are implemented for the treatment of the Hallux valgus (Bunion). The selection of the procedure is individualized for each case according to the severity, clinical examination, and patients demographics (age, gender, and activity level). The department practice protocol can be summarized in the following table.(table 1)

Table 1: the most common performed procedures for the treatment of hallux valgus in the foot and ankle unit

Procedure	Indications
Lapidus procedure Modified/Original	<ul style="list-style-type: none">- Severe Hallux valgus- HV with Unstable TMT or intercuneiform- HV with Arthritic TMT- HV with Collapsed medial arch- HV in elderly
Long Chevron/Scarf procedures	<ul style="list-style-type: none">- Mild to moderate HV deformities- HV in younger population
1 st MT basal medial open wedge osteotomy	<ul style="list-style-type: none">- Severe HV in younger population- HV with short 1st MT- Juvenile HV in addition to distal osteotomies-

Akin procedure for the hallux proximal phalanx is added in most cases. Metatarsalgia and callosities at the plantar aspect of the lesser metatarsals heads usually indicate the need for a shortening procedure. An open modified Weil osteotomy, or triple Weil osteotomy, fixed with speed tip 2.0 mm screws is the procedure of choice in these cases. For older patients Weil osteotomies may be done using minimal invasive percutaneous procedure without fixation.

Professor Herrera often uses Medartis® dorsomedial Lapidus APTUS® plate for fixation of the first TMT fusion, and occasionally uses plantar plate or crossing screws. Wedge plate is used for the fixation of the 1st metatarsal basal osteotomy. (Fig 7)



Figure 7 Hallux valgus procedures: AP plain X-ray of the foot showing lateral opening wedge of the base of the first metatarsal fixed with wedge plate (left) and original Lapidus procedure fixed with APTUS 2.8 plate and Akin procedure.

Bunionette:

Distal osteotomy of the fifth metatarsal is the preferred method to manage symptomatic bunionette that failed conservative management. Minimal invasive surgery (MIS) is also used in selected cases and in isolated deformity. With MIS weight bearing is allowed from the 1st day post operative.

Ankle osteoarthritis (OA):

Ankle OA is managed according to the grade, age, level of activity and affection of the other joints. In younger patients below 45 years old, with grade 1 or 2, hinged ankle distraction or arthroscopic debridement may be tried. Older ages with more severe symptoms, that failed palliative measures, are candidates for ankle fusion or ankle arthroplasty. Ankle fusion is performed in high demand younger population. Hintegra© total ankle prosthesis or Zimmer® total ankle are used. Ankle fusion is performed through variable techniques and fixed with wide range of implants. Cannulated screws, plates and hindfoot nail are all used, however, hindfoot nail is preferred to the other methods especially in cases associated with neuropathy like Charcot Neuroarthropathy of the ankle. Fig 8, 9, 10

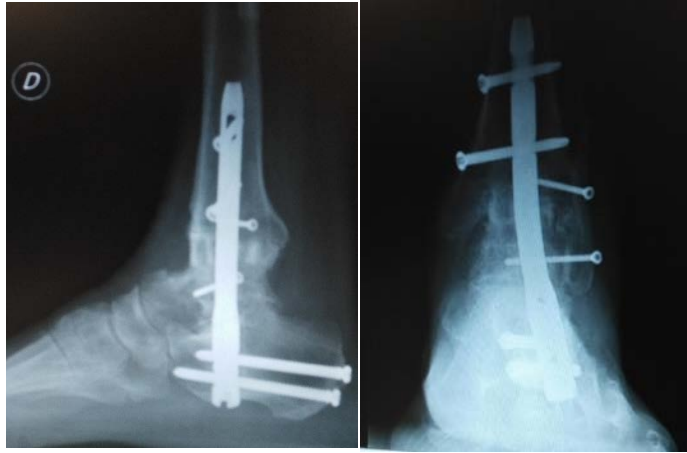


Figure 8 Ankle Arthrodesis with hindfoot nail

Lateral and AP plain X-ray showing arthrodesia of ankle and subtalar joint using a curved hindfoot nail



Figure 9 Osteoarthritis of the ankle treated with arthrodesis using cannulated screws

AP and Lateral plain X-ray of Ankle arthrodesis using Cannulated screws, distal fibula was used to add more support and rigidity to the construct

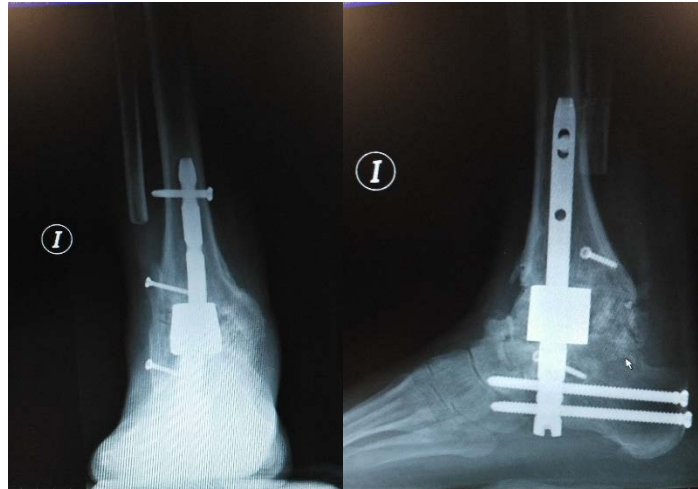


Figure 8 Charcot neuropathic ankle fused with hindfoot nail

AP and lateral plain X-ray showing ankle arthrodesis using hindfoot nail with tantalum block in a case of ankle Charcot neuroarthropathy.

Minimal invasive surgery:

MIS is performed in the department on a wide scale for carefully selected cases. Old age, poor soft tissue condition, and defective vascularity are the most common indications. Percutaneous Weil osteotomies, proximal phalanx basal osteotomy in hammer toes, combined proximal and middle phalanx osteotomies in severe hammertoe, Akin osteotomy, and extensor tendons release are the most common procedures done with MIS. Post-operative dressing and taping is crucial to

maintain the position in the first few days. Full weight bearing is allowed from the first day. Care should be taken to guard against edema, as it is a



Figure 11 Hammertoe treated percutaneously

Clinical preoperative and postoperative photos of a severe hammertoe case treated by percutaneous osteotomy of the proximal phalanx



Figure 12 Intraoperative radiograph of the percutaneous osteotomy of the proximal phalanx of the hammertoe of the second toe

common symptom following the procedure. Special instruments, saw blades and burrs are used during the procedures, without which it will be difficult to achieve a favorable result. (Figures 11, 12)

Attended foot and ankle operative cases:

1- Calcaneal fractures :

32 year old, male patient with bilateral calcaneal fracture due to falling from height. The right one was extra-articular fracture managed with percutaneous cannulated screw fixation under image guidance.

The fracture on the left calcaneus was intra-articular sanders type 3.

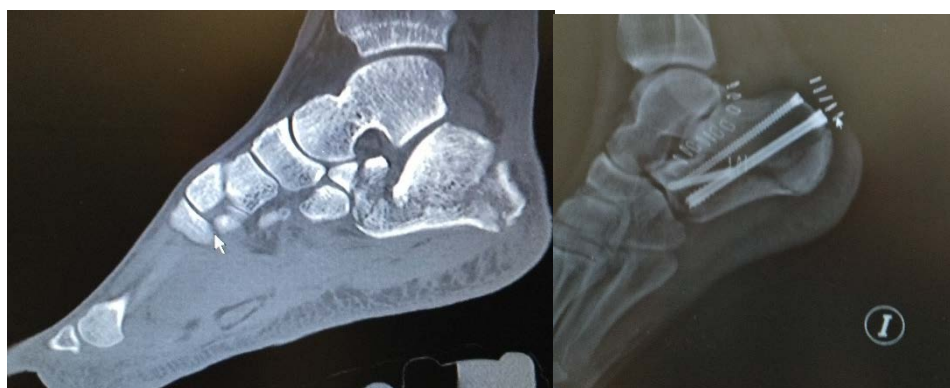


Figure 13 Intraarticular fracture of the calcaneus

CT scan sagittal view showing intraarticular fracture with joint depression of the posterior facet of the calcaneus on the left. On the right, a post-operative radiograph showing fixation with percutaneous cannulated screws following elevation of the articular surface through a sinus tarsi approach.

Minimal open reduction through a sinus tarsi approach was performed, a 6mm Schanz pin was used to help in reduction. Once a satisfactory reduction was obtained and confirmed with fluoroscopy K-wires used to temporarily maintain the reduction. Cannulated screws are inserted for the definitive fixation through percutaneous incisions. Figure 13

2- Severe Rheumatoid forefoot deformity with MTP joints dislocations and large dorsal synovial cysts:

58 years old female with bilateral rheumatoid foot deformities, Metatarsophalangeal joints (MTP) dislocations, Arthritic lesser MT heads, and large synovial cysts. The patient underwent meticulous dissection and removal of the synovial cyst followed by resection of the lesser metatarsal heads 2-5 (Lelièvre procedure). Figures 14, 15



Figure 14 Rheumatoid foot with synovial hypertrophy

Clinical photos of a rheumatoid foot with dorsal synovial hypertrophy and plantar callosities indicating increased loads on the metatarsal heads.



Figure 15 Metatarsal head resection

Post-operative plain X-ray of the same case in figure 14 after lesser metatarsal heads resection.

3- Chronic lateral ankle instability:

43 years old female with Chronic lateral ankle instability (CAI). Extra-anatomic reconstruction was done using Lee procedure. Peroneus brevis is cut after proximal tenodesis to the peroneus longus. The tendon is passed through a drilled tunnel at the distal fibula from posterior to anterior. With dorsiflexion and ankle in proper position, the tendon is sutured to itself with maximum tension applied. Additional repair of the ligament remnant is performed.

4- Flexor Hallucis longus(FHL) tendinopathy at the posterior ankle:

Female patient 39 years old presented with pain at the posterior ankle. MRI showed significant FHL tendinopathy and edema at the level where the tendon enters the talar tunnel. Hindfoot arthroscopy was carried out to debride the tendon and release the impingement at the talar tunnel.



Figure 16 MRI showing bright signal surrounding flexor hallucis longus tendon at the ankle level indicating severe tendinopathy

5- Isolated severe hammer toe:

45 years old woman with severe hammer toe deformity in the second right toe. Percutaneous osteotomy at the base of the proximal and middle phalanges is done. Percutaneous release of the 2nd flexor digitorum longus at the level of MTP joint as well as extensor digitorum longus. Taping and special dressing are applied to keep the toe in the new position. Weight bearing is allowed from the first day. Figures 11, 12

6- Open Weil osteotomy 2nd, 3rd and 4th metatarsals:

40 years old woman with metatarsalgia plantar callosities at the plantar aspect of the 2nd, 3^d and 4th metatarsal head. She had a previous chevron osteotomy of the first metatarsal for HV correction. Modified open Weil osteotomy of the 2nd, 3rd and 4th metatarsals was done and fixed with 2.0 speed tip screws.