

Higher Learning in Hand & Wrist Surgery - Santander 2015

P Goon (UK) 2015

Introduction

For my centre of higher learning for the FESSH travelling award, I chose Dr. Pinal's institute in Santander. A beautiful sun-drenched city of culture and food, it also boasts an immaculate setup for cutting-edge hand surgery. My aim was to learn and train in 3 specific areas:

1. Advanced dry arthroscopic techniques for acute and chronic wrist pathology
2. Microsurgical reconstruction in wrist, nerve and tendon pathology
3. Decision making and treatment of complex hand trauma including replantations, the mangled hand.

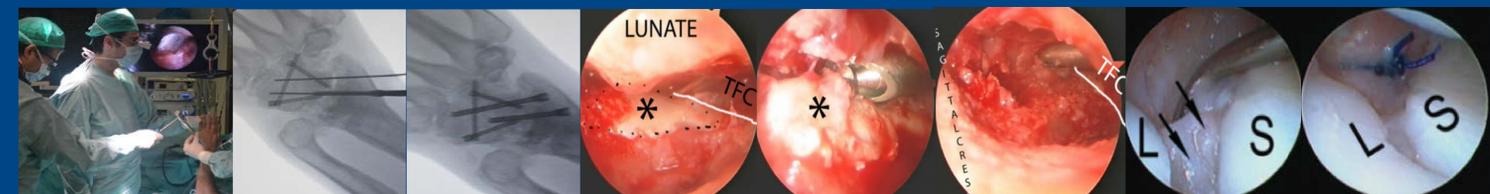
I spent 4 weeks working with Dr. Pinal and his team, and was immersed in clinics, surgery, and 2 teaching sessions per week. In this short time, I learnt many things but will limit my report to the areas highlighted above.

Dry arthroscopy

This technique was first pioneered by Dr Pinal in Santander, and is gaining acceptance in the hand surgery community. The advantages to wet arthroscopy are manifold, including 1. superior operative field 2. limited soft tissue extravasation 3. flexible technique. The main indications that I was exposed to include:- arthroscopic assisted distal radius fracture volar plating, wrist arthrodesis and distal radius corrective osteotomy for malunion. 4 fundamental points:

1. The scope valve remains open
2. The suction remains turned off until needed
3. The joint is irrigated when needed using a syringe and suctioning
4. The conversion of 'wet' to 'dry' is manipulated by suctioning & valving

The main advantages of arthroscopic intervention in these conditions include: minimal soft tissue dissection, accurate articular surface realignment, less metalwork (fusions). Examples are shown.



Dry arthroscopy technique (left to right): Dr Pinal's assistant creating an osteotomy under direct vision with scope (osteotome positioned and held by Dr Pinal, arm visible), note the video feed; conversion of a partial wrist fusion (previous arthroscopic 4-corner fusion using 3 cannulated screws) into a total wrist fusion (at the radiocarpal joint) using 2 further cannulated screws, after insertion of morcelized bone graft thru port access; arthroscopic resection arthroplasty of volar ulnar fragment (asterisk) after malunion, with resulting congruity of joint in final frame. The levelled surface tends to remodel after time *; dry arthroscopic view of scapholunate rupture/diastasis and after repair with restored normal scapholunate gap*

Microsurgical reconstruction in the hand & wrist

Microsurgery for nerve lesions, soft tissue defects and chronic bone problems are routinely undertaken in Santander. This includes vascularised nerve flaps from the toe for digital nerve reconstruction, web skin flaps for pliable soft tissue reconstruction in the digits, metatarsal bone flaps for articular resurfacing in the distal radius, adipose wrap around flaps for tendon adhesion and toe phalangeal bone flaps for non-union in the digits. Fundamental points include:-

1. thorough knowledge of donor anatomy, including the articular & nutrient vessels of phalangeal bone,
 2. incorporating skin buoy flaps,
 3. inset and closure of recipient site before anastomosis,
 4. continuous suturing anastomotic technique.
- Advantages of using a flap (either singly or a combination) of web skin, web fat, digital nerve, phalangeal bone block or joint, is the quality and pliancy of the skin, nerve, bone & joint caliber, and minimal donor morbidity. The disadvantage is the high level of microsurgical expertise required and steep learning curve.



Reconstruction of a non-union of a thumb [left to right] (after previous arthrodesis), using a bone block flap from 2nd toe, with its skin monitoring paddle; showing k-wire fixation with oblique and longitudinal wires; flap in situ demonstrating immediate perfusion of skin paddle; harvesting a bone block from tibia to maintain length in the donor toe; donor of 3rd metatarsal base free bone flap for reconstructing the lunate facet of radius*; neurocutaneous flap from tibial side of 2nd toe to reconstruct nerve and soft tissue defect in index finger, with defect of finger and after 1 year *

Reconstruction in the mutilated the hand

Dr. Pinal has coined the concept of the 'acceptable hand', which recognises the need for balance in the number of digits (min 3), movement (normal PIPJ motion), sensibility and their length. This is the 'bare minimum' requisite required of the reconstructive surgeon after intervention in these difficult cases. Surgery may need to be staged, depending on the need for soft tissue cover, additional bone stock, and number of toe transfers. The choice of performing the optimum surgery for the patient must never conflict with that of easier, quicker options that will ultimately result in a poorer outcome. In summary, fundamental points include:-

1. achieve 'acceptable' hand as a minimum
2. operate early rather than delayed
3. staging surgery, to allow sufficient soft/bone for next stage of reconstruction
4. never go for 'easier' option if functional outcome worse



Reconstruction of a mutilating injury (left to right):Free lateral arm flap for soft tissue cover in the 1st stage; raising the first of 2 2nd toes in the 2nd stage (a week later) ; radiograph showing fixation of 2nd toes at different levels (metacarpal, hamate), microvascular anastomosis with continuous technique, with tourniquet still inflated; Dr.Pinal in his element and happiest; 2 2nd toes, atop a lateral arm flap, perfusing well; donor foot appearance.

References

1. del Pinal F, Klausmeyer M, Thams C, Moraleda E, Galindo C. Arthroscopic Resection Arthroplasty for Malunited Intra-Articular Distal Radius Fractures. J Hand Surg Am 2012; 37A: 2447-2455
2. del Pinal F. Dry arthroscopy and its applications. Hand Clinics 2011;27:335-345
3. del Pinal F, Klausmeyer M, Moraleda E, de Piero GH, Galindo C, Studer A, Cerezal L. J Hand Surg Am 2013;38:1883-1895
4. del Pinal F. The indications for toe transfer after "minor" finger injuries. J Hand Surg Eu 2004; 29:120-129

* Reproduced with permission from article 1-4, to illustrate range of microsurgical soft tissue and bone reconstruction

Summary

In my short time in Santander, I was fortunate enough to learn many important concepts and techniques for difficult complex problems. The most important of all was that advances in the field of Hand Surgery can only be gained through the utilisation of ones imagination (to coin Terry Whipple's phrase), and this I encountered in abundance working with Dr Pinal. I found him and his team to be keen teachers and exceptionally generous in their knowledge and hospitality. I would highly recommend his unit, to any fellow that is post Hand Diploma, that is keen to expand their reconstruction repertoire, and above all, to think outside the norm.

Santander, 27th November 2015

This is to certify that **Dr. Patrick Goon** has been visiting our unit during the days 3rd-27th November 2015 in the private practice and in the Hospital Mutua Montañesa, training in arthroscopic and microsurgical hand and wrist reconstruction.

During his time with us he has shown great interest to improve his knowledge in hand surgery and has attended all our activities: office, surgery, and clinical sessions.



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