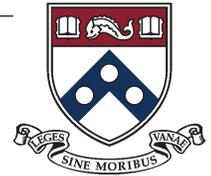




Penn Orthopaedics in Nicaragua

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In the fall of 2012, the University of Pennsylvania Department of Orthopaedic Surgery participated in a series of medical volunteering trips in partnership with Health Volunteers Overseas. During the first trips, faculty and residents traveled to Managua, Nicaragua to work alongside local orthopaedic surgeons treating an underserved population. The following are a few glimpses into our experiences and observations:

Day 1, Sunday, 11/18/12

Tengo hambre = "I am hungry"

That's pretty much all we felt as we disembarked our planes and stepped into Managua, Nicaragua. We were hungry for food, yes, but also to teach to learn and to absorb and see this new place that we knew so little about. We're soon transported to Casa Naranja ("Orange House"), a little oasis of an Inn in an eclectic neighborhood that includes a variety of restaurants and the Taiwanese embassy. My two-week home feels lush and tropical though it's temperate now.

Over dinner we talk about the Nicaraguan three tiered health system—public, which is free welfare at designated hospitals, "social security" which is contracted cared based on employment, but still government funded, and private, which is only for those who can specifically afford it. Total charge for knee arthroplasty: \$8k.

Day 2, Monday, 11/19/12

Mucho gusto = "Nice to meet you"

National Hospital or Hospital Escuela Roberto Calderón Gutierrez is one of the two largest public hospitals in Nicaragua. It serves those who have nowhere else to go. As soon as we enter, I know we're somewhere "else."

As part of the introduction, we were led through a sea of patients waiting to be treated in the fracture clinic to a small, dilapidated exam room where we met the acting director of orthopaedics. We then went on rounds through one of the hospital's crowded wards. There were 6-8 people per room, many in skeletal traction, no privacy curtains between patients. We stood at the bedside, looked at the x-rays, and they asked us what we would do with each fracture. Many of the fractures were difficult, highly comminuted, and frequently days or weeks old. It seemed that most of the patients would be treated with traction or immobilization for extended periods of time, due to a lack of implant availability.



To give you a more vivid picture, two of the patients are in skeletal traction—hard films show a 2-week old pilon with persistently swollen soft tissues. They are unsure about plating or an external frame because they don't know when they'll have the resources. Films from patient 2 reveal an anterior pelvic separation (still out of place) with a posterior pelvic fracture. He is resting comfortably in bed with no IV pain medication. He also happens to have a serious open fracture that is also awaiting treatment. Timing? Uncertain, again because of resources. They hope to get to the open fracture first.

We are soon whisked to the OR. The first case is a fragmented tibia-fibula fracture. They move efficiently—especially considering their limited tools. The amazing thing: no live x-ray! In the U.S., the case does not start until we have this. But after 2 hours and zero x-rays, the case is complete. It's not perfect—screws have to be manually cut to length—but it was just right for the situation.

Day 3, Tuesday, 11/20/12

¿Ya llegamos? = “Are we there yet?”

Our second day at the hospital was every bit as eye-opening as the first. We started the day with a total knee replacement. The surgery went well and actually was not hindered by any significant lack of equipment. The instruments were a current set from Zimmer using the intramedullary femoral guide and extramedullary tibial guide. The implant itself was a posterior stabilized design from a Brazilian company Impol, which are apparently less expensive.

We're really looking forward to the next patient's case. A subcapital femoral neck fracture in an 84 year-old edentulous woman. The implant of choice: a Thompson prosthesis or rather, the Impol version of the implant which became popular circa 1950. Jaimo had to scrub this one just for the anachronistic experience of history!



Our afternoon cases were a true departure. Jaimo worked on a subluxated Weber C ankle fracture, without fluoro, and with only one plate choice. Adam helped with a comminuted petrochanteric femur fracture, which we put a sliding hip screw into, also without fluoro, and with severely limited choices of screw lengths. We palpated the femoral neck and placed the guide wire manually, in a trajectory matching that of the neck, as best as we could tell. We then placed the longest sliding screw available (85mm). We won't see the results of our efforts until tomorrow, when they will obtain the post-op x-rays. So for tonight, we just have to reflect on the procedures and hope for the best.

Are we there yet? Yes, we are. This is a lesson in humility.

Day 5, Thursday, 11/22/12

Cosas nuevas puede ser humillante = “New things can be humbling”

First case is hemiarthroplasty for a femoral neck fracture. Dr. Jimenez says “this is your case.” We try to explain to him that we do it very differently and I am a little suspicious of our ability to make this look smooth without our team, our instruments, implants. He is not to be dissuaded. He wants to

see it our way. We become very accustomed to what works with what is familiar... As the case starts, communication is earnest but still sparse and hit or miss. To start, we feel for landmarks and cut; no marking pen. Electrocautery is used instead of the preferred knife. It takes at least 15 seconds to explain Cobb elevator. Then things progress until we're ready to take off the posterior external rotator tendons. They have no “c” or double angle retractor. Hmm... During the neck cut, the battery dies so it is finished with an osteotome. Curette instead of a canal finder. No box osteotome... The Thompson, which we've only seen in books and in Dr. Steinberg's display shelf is secured with hand-mixed and packed cement. Pull pull pull and “thok”-success! Stable as she can be. That thing is never coming out. But oh, how humbling.

Day 6, Friday, 11/23/12

Tijeras = “scissors”

Today we had conference with a visit from the chief of surgery. X-rays were reviewed including the Thompson (whew, looks good, though a touch long), the sliding hip screw is contained in the bone with a good center position.

Our complete Spanish incompetence was psychologically bothersome today more than before. Yes, Endress, we miss you. So we decided to at least try to say the instrument names, Nicaraguan style. Dos-zero Vee-creel, Tijeras, right!

The last case of the day was a young man with a large knife wound to his palm from a week ago with index flexor tendon injuries as well as nerve injuries. As we began to prep for the case, it became clear that they were going to rely heavily on us to perform this case. We have our own little conference, and decided that together we could do this.

It's dingy but we clean it nice. Both tendons definitely out, no cascade, no tension. Found both ends of the severed FDS and FDP as well as the severed common digital nerve. The tendons were repaired primarily with core sutures and epitendonous sutures. We have a cascade again and full passive motion shows no gapping. Love it. They did not have the tools or suture to do micro style nerve repair, so a 4-0 nylon, just to approximate the ends. Wash again.

This was definitely one of the biggest, most difficult, but most rewarding cases for Adam and as primary surgeon. The residents say that the patient will get hand therapy, but it is hard to imagine him receiving the follow-up that we would like and we're a little concerned about his outcome.

Day 10, Tuesday, 11/27/12

Dame = “Give me”

Jaimo gave a lecture at morning conference on semi-extended parapatellar tibial nailing. The major advantage to the surgeons here would be that they would not need to hang the operative leg off the side of the table, limiting the potential for contamination. The presentation generated a lot of discussion, and as luck would have it they had a tibial nail scheduled today for Dr. Somarribba. He agreed to let Jaimo do the semi-extended approach.

The tibia does not look technically difficult. Just past

midshaft, nearly isthmic... we go through the parapatellar approach with them, which not surprisingly, is easier and nice for demonstration with no geniculate branches blurring your field. We can see the intact synovium and they all palpate the subretinacular tissue plane and the lateral border of the patellar tendon. Nods all around. Entry reamer—dame! Nice try. So we ask for the awl, which we are happy using but a little tentative about doing so without any x-ray. The lateral border of the tendon is a good guide. Dig, push, dig push. Need the guide wire now—dame! No ball tip, no bend. It doesn't pass. Instead we have to use a sharp canal finder. Okay it passes... Ahhh, the neck of their jig is not long enough to get around the patella—dame! But we make it work. Both locking screws go in with no problem including the no-x-ray perfect-circle distal screw in one shot by Dr. Somarriba. The case went well but we wonder if they will adopt it.

If any of you have the opportunity to come here—or another under-resourced site—observe carefully, because there is so much to see. This hospital, for instance, may be in need of many repairs but the floors are the cleanest anywhere. Someone seems to be cleaning all the time. As I write this at 1:00pm, mopping has occurred at least twice and will again soon.

Day 13, Friday, 11/30/12

En la selva, de la selva fuerza = “In the jungle, the mighty jungle...”

For our send off, the theme appears to be super-malunion. The bilateral ankles/pilons have been sitting, waiting for 23 days and the 2nd wrist is 5 weeks old. Independent of the cases, we're feeling mildly guilty that our linguistic incapacity

has kept us from becoming lifelong friends with the folks here. To make up for it, we ordered a big lump of food for the staff from La Terraza Peruana, our now favorite little Peruvian place in Mangua.

A lot of mixed emotions on our last day in the hospital. It has been eye-opening in many ways. The patients, the staff, the techniques, the resources (and lack there of), have given us a new perspective on our specialty, and have made us consider for the first time—what is the essence of what we do? What is required to do what we do successfully? What can we do to help the patients here? At the same time, we cannot deny that these two weeks have also exhausted us, and we are looking forward to returning to the relative luxury of our hospitals at home...

