



Penn Orthopaedics in Nicaragua

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Through a generous donation from the Biedermann Family, we had the unique opportunity to participate in a medical mission trip to Managua, Nicaragua, organized through Health Volunteers Overseas (HVO). HVO is a private, nonprofit organization founded in 1986 that focuses on delivery and improvement of healthcare internationally with programs in more than 25 countries. The programs include specialties such as primary care, oncology, infectious disease, and general and surgical subspecialties.

In Managua, we were graciously hosted by Dr. Dino Aguilar and Dr. Mario Cuadra, two local orthopaedic surgeons who have both spent time abroad advancing their own orthopaedic knowledge in order to better serve their local population. Dr. Aguilar is a local legend of sorts, who after many years as an instructor at the government hospital, now has his own private practice and is part owner of one of the local orthopaedic implant distributors. Dr. Cuadra recently completed his residency at the same teaching hospital and is being developed as a future leader of orthopaedic surgery in Nicaragua. After completing his residency in Nicaragua, he traveled extensively in the United States, doing short fellowships, most recently at the Cleveland Clinic.

We worked mainly out of the government hospital, Hospital Escuela Antonio Lenin Fonseca (HEALF), the same institution where Dr. Cuadra had recently completed his residency training. From the moment we entered Fonseca, it was clear that we were there to work. We got a brief tour from Dr. Cuadra, but shortly thereafter we were whisked away to the surgical suite to review radiographs and implants for the coming cases. The operating complex was simple but sufficient, with multiple operating rooms and a common scrub area. The front desk worked not unlike the one at our own institution, and every case performed in the hospital was documented in a massive ledger

for later reference. Most of the cases were done under regional anesthesia and the attending anesthesiologists were extraordinarily adroit at placing spinal catheters.

Once we started discussing cases, it was clear that in anticipation of our arrival, they had saved some especially difficult fractures for us to tackle. Radiographs of long discussed cases appeared and were passed around, and there was intense interest as to how we would handle each case. Instinctively, we inquired about what implants were available. Not surprisingly, the selection of implants was minimal and did not include periarticular or locking plates, this being in sharp distinction to what we are used to in the US. Most often the available implants were those that were no longer in circulation for use in American storerooms. Some of the implants readily available tended to be of sizes and lengths that were not often used. Frequently, plates and screws were cut to fit the needs of the particular procedure, and the intramedullary nails used were the best approximation of length and diameter. Principles of fracture fixation, such as the tip-apex distance, are well known by the residents and staff, but often could not be implemented due to the available lag screw lengths. Through it all, the local and visiting surgeons





utilized their creativity to limit the untoward effects of the available resources.

There are several facets of their care system which we found unique and somewhat different than the US. When a patient in the US presents with a fracture, the necessary implants for the case are obtained via a phone call to the control desk of the operating room or to the implant manufacturer. In Nicaragua, the surgeons will write a prescription for the desired implant, and the patient goes to an outpatient implant distributorship

to buy their implant. If the patient cannot afford commercial implants (e.g., Smith and Nephew, Synthes, Stryker, Zimmer, etc.), there are options for more generic or inexpensive replicas. Once the implant is purchased, the consultant for that company not only attends the case, but also scrubs in and assists with the surgery.

The similarities between the local surgeons and those of us visiting are striking in the sense that they share the same struggles with fracture patterns and patient disease that we do in the US. The surgeons in Nicaragua are very skilled, just as well-read, and even more creative than many of us in the US. Not only do they tackle the same complex fracture patterns we do, they do it often weeks to months after the initial injury and mostly without the aid of specialized surgical tools and implants.

Our experiences in Nicaragua have been unmatched by anything during residency or in practice. The graciousness of our hosts and the desire to perfect their orthopaedic craft for the benefit of their patient population is unparalleled. At the same time, their willingness to teach us about their culture and their system was also extremely satisfying, a good lesson for us to take away as we host others. We would make this trip again in a heartbeat and recommend it to others. If only we could stay longer and see and experience more....