

Trip Report to Arusha, Tanzania

By Dr. Andrew Park



As a chief resident in orthopaedic surgery at Washington University, I had the unique opportunity to go abroad for 2 weeks for an international elective. After consulting with Dr. Lewis Zirkle of SIGN Fracture Care International, I chose to go to Nkoaranga Lutheran Hospital in Arusha, Tanzania to work with Dr. Sam Kiwesa. I had never been to Africa, and my medical school and residency surgical experiences were all at level 1 trauma centers in the United States, so I had at best a vague idea of what to expect. Before my trip, my thoughts primarily centered on what resources they wouldn't have—*intraoperative* fluoroscopy, plates, screws, standard intramedullary nails, reduction tools, and even eye protection. After my two weeks in the OR there, I found that while all the tools I expected to be absent were in fact absent, I was instead filled with admiration for how much they could do with so little.

Arusha is a city of 500,000 people and a major hub for tourism, as it is located between the Serengeti safari circuit and Mount Kilimanjaro. While it has several hospitals, the only one performing orthopaedic surgery is Nkoaranga Lutheran Hospital, an open air, 100 bed hospital with 1 main operating theater. There are separate wards for male, female, pediatric, and pregnant patients, with anywhere from 2 to 8 beds per room. They have one x-ray machine, a dark room where x-ray films are developed, and a lab. Unlike the US, it is the family's responsibility to bring food to the patients, and accommodations are quite cramped, but none of the patients ever complained. In fact, they were the toughest patients I had ever treated—I saw one man with a floating knee and contralateral distal femur fracture move himself and his unsplinted legs from the stretcher to the OR table. I ran to help him but by the time I got there he had already basically moved himself; it was beyond impressive and unlike anything I had ever seen at home.



At Nkoaranga Lutheran Hospital I worked with Dr. Sam Kiwesa, the only orthopaedic surgeon in the region. Dr. Kiwesa grew up on the grounds of the hospital since his father was the general practitioner there, and after he went to medical school and did an orthopaedic surgery residency, he went back home to establish an orthopaedic surgery referral center. It could not have been easy to obtain the surgical equipment, recruit the OR staff, and essentially

build the surgery department from scratch, but it was incredibly fortunate for the people of Arusha that he made the creation of this surgery center his mission because there is an epidemic of long bone fractures there. These fractures are almost entirely sustained while mining tanzanite, falling from trees while cutting firewood, or crashing while riding the piki piki, a small motorcycle that ferries dangerous numbers of unhelmeted passengers and fills the void left by a lack of public transportation. Dr. Kiwesa's practice consisted primarily of femur and tibia fractures, but unlike the trauma services I had been part of as a resident in the U.S., there were a disproportionate number of patients with malunions or nonunions that were over a year old, greatly increasing the complexity of the cases.

The windows in the OR served as the light boxes for x-rays, suction tubing was cleaned and re-sterilized, and we used the same bovie pad on all patients until we ran out of bovies in my first week there. All lower extremity fractures were done under spinal anesthesia and upper extremity fractures with ketamine alone. There was no intraoperative fluoroscopy, so fracture reduction and the placement of screws was dependent on feel. Speaking of screws, when we did not have screws of the correct length, we would put in long screws and cut off the prominent ends on the other side of the bone. Given the lack of fluoroscopy, the SIGN nail was truly a game changer. All of these patients would have otherwise been treated with traction, casting, or inferior Kuntscher nails, but thanks to SIGN their crooked bones could be made straight with locked intramedullary nails. Additionally, the solid nature of the stainless steel SIGN nail enabled it to be used as a very helpful reduction tool in malunion cases. We were able to achieve excellent results in patients with complex injuries despite the limitations of operating without fluoroscopy. It is my hope that these surgeries that took less than 2 hours will enable the patients to enjoy many productive years once they heal.

I enjoyed a very humbling yet productive 2 weeks in Tanzania with Dr. Kiwesa, and while I hope I helped, I definitely felt that I benefited more from the experience than the patients. I learned how to achieve a great result despite operating in a resource-strapped environment, gained an appreciation for the SIGN nail, and most importantly got to know Dr. Kiwesa and his family, his OR staff, and the Tanzanian people, who are among the friendliest in the world. I couldn't go down the hallway without people saying "jambo" (hello) or "karibu" (welcome), and Dr. Kiwesa welcomed me into his house for dinner every night. Dr. Kiwesa is a master SIGN surgeon who does it all, including placing the spinal when the anesthetist can't get it, and it truly was a privilege to work with him and his patients. I had a wonderful time and hope to continue this partnership in the future.