

## Teaching Fracture Repair in Tanzania



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Dr. Zirkle and I returned to Muhimbili Orthopaedic Institute in June 2008. During our first visit in November 2008, we were impressed by the number of orthopaedic incidents in training and the level of sterile techniques employed by the surgeons, operating nurses and technicians. This, along with the 300 SICM surgeries performed since November, made Muhimbili Orthopaedic Institute a clear choice for being invited to participate in the SICM Hip Construct project.

Muhimbili Orthopaedic Institute is a 150 bed hospital located in Dar es Salaam, Tanzania. Established in 1996 under the leadership of Executive Director and orthopaedic surgeon, Professor L.H. Masera, the hospital serves as the main referral hospital for trauma in Tanzania. (See Exhibit 1.) Professor Masera is respected by both the surgeons and the nursing staff for implementing a vision of excellence in patient care and providing his staff with access to training opportunities.

Exhibit 1: Muhimbili Orthopaedic Institute before and after SICM



Muhimbili is a government run hospital that treats the poor. The patients cannot afford to purchase implants to fix their fractures, and so were awaiting hospitalization for time to their deaths in fractures. Many patients were arriving for treatment each day that were leaving. By law they could not be turned away. Beds built for 40 patients were filled with 80, resulting in patients lying on the floor. Having SICM implants available for free to their patients made a dramatic difference to the congested wards.

The SICM program manager for Muhimbili Orthopaedic Institute is Dr. Edward Elexson. (See Exhibit 2.) He takes responsibility for reporting the SICM cases, and has done many of the cases reported since SICM first began at Muhimbili Orthopaedic Institute.

Exhibit 2: Dr. Elexson checks on a SICM patient.



Planning for SICM site visits begins two to three months in advance. To ensure that all interested surgeons get an opportunity to scrub, Dr. Zirkle sets a goal of four to five cases each day. He shows the surgeons the surgical technique by doing most of the first case, and then lets the surgeons take over aspects of the

*continued on page 18*

continued from page 14

technique in each following case so that by the end of the site visit, there is five surgeons are well trained in the SGN technique. Dr. Elzeer was well organized and successfully arranged interesting SGN IM Nail and Hip cases, as is indicated by the list of patients for the first day:

Stella, aged 15 years, received a distal fracture to her left femur when a portion of the brick wall at her home fell upon her. Her parents brought her to Maheshbali Orthopaedic Institute where she lay in traction for four weeks with no healing. She was diagnosed with rickets and anemia. Her doctors conferred with Dr. Zirkle and decided to give additional stability to the fracture by implanting the SGN nail using the retrograde approach with minimal damage to the growth plate.

Sandra is a vivacious female aged 34 years. Even when experiencing extreme pain, her outgoing and energetic nature fills the room with joy. Sandra was driving home from a funeral when her car ran-off the road. The car rolled over, ran into a ravine and Sandra lay in the car for six hours until she was found and taken to the hospital. She came to the hospital that morning with a broken hand and mid-shaft fracture of her right femur. She was immediately taken to the operating room where surgeons fixed her hand with K-wire and placed a SGN nail in her femur. Frustrated to learn that she would have to be on crutches for four to six weeks while her injuries healed, she was reminded that had she arrived seven months earlier, she would have been placed in traction and remained hospitalized for several months.

Lavender is 65 years old and the main breadwinner for his family. He was a passenger on a motorcycle that was hit by a car. The impact caused an intertrochanteric and mid shaft fracture of his left femur. He was the first patient at Maheshbali Orthopaedic Institute to receive a SGN hip construct surgery. The compression screw stabilized the proximal fracture and the SGN Nail provided stabilization to the proximal and mid-shaft fractures.

Nirav is 79 years old. He suffered a proximal fracture in his right femur and a proximal tibia fracture on the same side. The hospital in his home town did not have the facilities to fix his fracture, so he was referred to Maheshbali Orthopaedic Institute, 891 miles away. He traveled by bus to Dar es Salaam and was admitted on May 9. His surgery took place on June 2. On July 18, two and a half weeks after surgery, he was at partial weight bearing and the x-ray showed healing.

We were able to do so many surgeries each day because Maheshbali Orthopaedic Institute has three operating suites dedi-

cated to orthopaedics and a very well-run operating theater. Dr. Elzeer works closely with nurse Inmaculada Bosa, the manager of the operating theatres, to schedule the cases. Nurse Bosa is responsible to ensure good sterile technique and that the instruments and implants are ready for the cases. She and her assistant manager, nurse Roselinepine, also train the surgical nurses in the surgical technique so they can anticipate the needs of the surgeons during each case. Nurse Bosa is in regular contact with me or with Sharon Bender from our shipping department to survey equipment needs or discuss improvements to inventory control.

The best programs are those with surgeons and medical personnel eager to learn new techniques for surgery and patient care. Surgeons, residents and visiting students at Maheshbali Orthopaedic Institute enjoyed observing the cases even when it was not their turn to scrub. On the last day of our visit, the residents presented the post-op reports for the four hip cases and four SGN IM Nail cases that were conducted during our three days of surgery.

The surgeries were well done and everyone learned from each surgery. The SGN hip construct is designed to be used without a C-arm. The surgeons performed the hip cases well and demonstrated their tactile senses as they used the pilot drill to create a path for the compression screws. One hip case was a segmental fracture, which was a challenge because the interlocking screw had to enter the femoral head after the rotation was determined by placing the distal interlocking screw.

Under Professor Mawani's leadership, the surgeons are encouraged to conduct research. Dr. Elzeer received a grant from the AO foundation to attend the SGN conference held at our headquarters in August, where he presented his paper on the antibiotic properties of honey on non-infected open wounds. Dr. Elzeer has been invited to summarize the SGN conference for the AO Dialogue. With year resident Billy Haonga presented a paper at the conference on Maheshbali's experience with proximal femoral fractures.

A natural outcome of starting a SGN program is that the hospital will teach the SGN technique to other hospitals in their region. Professor Mawani has added a new concept whereby the surgeons from Maheshbali will take the SGN equipment to regional hospitals that do not yet have orthopaedic surgeons and care for trauma patients in the outer regions. This way, patients with long bone fractures can be treated close to home rather than make the long, painful bus ride like Nicolas. Their excitement to expand SGN beyond their hospital walls and improve orthopaedic care in all parts of their country is overflowing.

James Diller is Chief Executive Officer of SGN, a non-profit organization that designs, manufactures and markets patented, FDA-cleared orthopaedic implants to hospitals in developing countries. Mr. Diller regularly travels to assist Founder and President, Louis G. Zirkle, Jr., M.D., with the training of surgeons on the SGN IM Nail System. Since inception nearly ten years ago, SGN surgeons have given more than 45,000 patients a chance for renewed mobility. Mr. Diller can be reached at [james@sgn-post.org](mailto:james@sgn-post.org).