



Annual Tanzania Neurosurgery Project Summary: 2013

Neurosurgical training is almost non-existent in developing countries, particularly those in East Africa. In Tanzania, there is an estimated 1 neurosurgeon per 13,000,000 people; consequently, most healthcare facilities there lack adequate neurosurgical care. Neurological problems resulting from traumatic brain/spine injuries, hydrocephalus, and many birth defects can be reversed if treated early in the natural history of the event.

Neurosurgical diseases have been ignored by governmental and private health organizations in developing countries. However, increased global health awareness and collaborative academic training programs are building neurosurgical capability in these areas of the world. The Weill Cornell Bugando Neurosurgical Program was established to foster collaboration between Bugando Hospital and the neurosurgical department at Weill Cornell Medical College.



The Weill Cornell Neurosurgery Program focuses on Bugando Hospital in northern Tanzania, a regional center which serves a population of 14 million. The program consists of several components:

- Dr. Härtl and his team, who train local surgeons to perform basic neurosurgical procedures using locally available equipment and resources. His team conducts hands-on training of doctors in Tanzania, empowering them with a high level of expertise in the management of neurosurgical disorders and neurosurgical procedures (Wait and Härtl 2010). Providing the highest level of surgical training to these eager, talented surgeons impacts every level of care – nursing, anesthesia, intensive care treatment, and general ward care.
- Promising Tanzanian surgeons, who are selected for a short-term observational fellowship at Weill Cornell Medical College in New York. The purpose of this fellowship is to provide motivated surgeons with the opportunity to experience first-hand high level neurosurgical care. The fellows also greatly facilitate communication between the Cornell team and the Bugando surgeons once they return home.
- An annual neurosurgery meeting held in East Africa, at which international faculty present lectures and practical workshops, and even perform live surgeries (Kahamba 2011). Surgeons and nurses from many African countries participate.
- Conference calls and Skype conferences between the Cornell team and their colleagues at Bugando, which present an opportunity to discuss challenging cases and patient management.
- A database implemented at Bugando to monitor surgical patient care and ensure quality. The data will be used to make decisions about the allocation of resources and the success of the current program.

We are confident that these efforts will continue to improve patient outcomes, and hope that in time, they will serve as a model for other hospitals.

Weill Cornell Brain and Spine Neurotrauma Course – Day 1

We began with course lectures and practical teaching sessions. Dr. Roger Härtl discussed the treatment and management of traumatic brain injury. Dr. Luke Smart gave an overview of neuroimaging. Innocent Njoku discussed basic neuroanatomy. Tara Sutter and David Suarez gave a lecture on proper operating room hygiene. Mike Verelli demonstrated the use of various surgical spinal instruments. Dr. Qureshi gave a talk on portable neuroendoscopy, a new concept within neurosurgery.

All lectures were well received and highly interactive. A question and answer session allowed for open discussion and collegiate interaction.





Patients were also seen throughout the day; ten patients were selected for surgery later in the week. Potential surgical patients were screened for treatment by future neurosurgical groups from other institutions.



Weill Cornell Brain and Spine Neurotrauma Course – Day 2

The second day was dedicated to the surgical treatment of various pathologies, with a special focus on neurotrauma of the brain and spine. In one notable case, a young man in his early-to-mid twenties presented with an incomplete vertebral fracture at the level of T12, which had caused subsequent lower limb weakness. Our team performed a laminectomy at T12 to decompress the spinal cord, with rod and screw placements for stabilization from T10 to L2. The patient was stabilized and brought to the ICU. In an unrelated case, a 17-year-old female presented with left frontal lobe herniation and subsequent skull fractures; she was brought to the Emergency Room by police officers, who reported that she had been harshly struck in the head. The patient was alert, responsive, and rushed to the OR, where skull fragments and necrotic tissue were removed. The wound was disinfected, debrided and closed; no additional instrumentation was used for fear of infection. The patient was then brought to the ICU for monitoring.

In both cases, neurosurgical intervention yielded positive outcomes despite challenging operative conditions and out-of-date equipment and resources. Nevertheless, these cases should be taken as a call to arms for the implementation of better neurosurgical training programs in Tanzania and other African countries.



Weill Cornell Brain and Spine Neurotrauma Course – Day 3

The third day was focused on advancing spinal surgery and treatment of neurotrauma through teaching sessions in the OR. Dr. Härtl directed Bugando residents in performing a L4 decompression. There were no intraoperative complications, and the procedure was a success. Dr. Moody from Nairobi, Kenya, taught Bugando residents the basics of neuroendoscopy. He developed a ‘portable’ neuroendoscopic unit for use in East Africa; the unit is no bigger than the average briefcase and weighs less than 15 kilograms. Dr. Moody travels throughout East Africa performing and teaching endoscopic third ventriculostomy for the treatment of hydrocephalus, which is endemic to the region. At Bugando, he treated 5 hydrocephalus cases with good results and instructed residents in his technique. Our chairman Dr. Philip Stieg taught at Muhimbili Orthopedic Hospital in Dar es Salaam, south of Mwanza. He also performed some of the more complicated cases – including a posterior fossa tumor – with great success.

Each of these physicians exemplified the fundamental global health mission at Weill Cornell Medical College: to improve global healthcare outcomes by means of academic training.



Weill Cornell Brain and Spine Neurotrauma Course – Days 4/5

We continued to see patients in clinic and to perform ventriculostomies for the treatment of hydrocephalus. And when we reflected on everything we had seen and done at the end of our week in Tanzania, two things were immediately clear: 1) opportunities to improve clinical outcomes in neurosurgical global healthcare are numerous and 2) success in these endeavors will be rooted in strong interpersonal relationships and collegiate collaborations.

Our time in Mwanza was eye-opening, and we are humbled by the dedication of the physicians who work there and the resilience of their patients. We are grateful to the Weill Bugando and MOI Institutions for their hospitality and cooperation, and are excited to continue building on these relationships in future expeditions.



(Photos by Innocent Njoku).

References:

- 1) Härtl R, Ellegala DB. Neurosurgery and global health: going far and fast, together. *World Neurosurg.* Apr 2010;73(4):259-260.
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- 3) A.E. Khamlichi. African neurosurgery: current situation, priorities, and needs. *Neurosurgery*, 48 (2001), pp. 1344–1347.
- 4) Kahamba JF, Assey AB, Dempsey R, Qureshi MM, Härtl R. The Second African Federation of Neurological Surgeons Course in the East, Central, and Southern Africa Region Held in Dar es Salaam, Tanzania, January 2011. *World Neurosurg.* Nov 7 2011.

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By **check**: Make check payable to Weill Cornell Medical College and note Mission in Tanzania in the memo area. Please mail your check to:

Weill Cornell Brain and Spine Center
c/o Ana Ignat, Department Administrator
525 East 68th Street, Box 99
New York, NY 10065

By **credit card**: Please visit our website:

<http://weillcornellbrainandspine.org/ways-give>
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by clicking on the “Donate Now” button.

Your contribution will be used for:

- Data collection of Neurosurgery outcomes at Bugando Hospital. We support a salary for a data collection person and maintenance of the database.
- Support of Fellowships of Tanzanian MDs to Weill Cornell Brain & Spine Center.
- Support of Neurosurgery Courses at Bugando / Tanzania: For example, we may support travel of African MDs to the courses in Tanzania, support acquisition of cadavers for practical courses, cover costs for meeting venues.
- We DO NOT use your contribution to support travel of any US surgeons to Tanzania.
- We DO NOT use your contribution to purchase any medical supplies or equipment. We may, however, use it to fund a container to ship urgently needed equipment to Tanzania (for example, an operating microscope).