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Editorial

Surgical volunteerism as a collaborative teaching activity can benefit surgical residents in low-middle income countries

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ABSTRACT

Surgical care is desperately needed in low-middle income countries (LMIC). Due to small numbers of faculty in local training programs, residents have limited exposure to subspecialists. We describe a teaching activity between visiting surgeons from the U.S. and a residency program in Malawi as an example for how surgeons in high income countries can meaningfully contribute. A short-term education activity was developed where residents participated in a pre-test on pediatric surgical management, lectures, intra-operative instruction, bedside rounds and a post-test. Five residents participated and all intend to practice in sub-Saharan Africa. All residents improved their scores from the pre-test to post-test (mean 44%–91%). The residency program performs approximately 1200 major surgical cases and 800 minor surgical procedures each year, representing a broad range of general surgery. Additionally, the residents encounter a broad range of pathology. Short-term mentorship activities in partnership with an established training program can enhance surgical resident education in LMIC, particularly for subspecialty care.

1. Introduction

Surgical care is desperately needed in low-middle income countries (LMIC) [1] and several teaching models have been established to train local surgeons. The Pan-African Academy of Christian Surgeons (PAACS) is one model that has established a network of 5-year residency training programs throughout Africa [2].

Due to the small number of surgical faculty in these programs, the residents have sparse opportunities to learn from surgical subspecialists. Visiting surgeons can provide mentorship and training to supplement the base of training. Interest in global surgery is increasing, and many surgeons in high-income countries (HIC) are interested in contributing to surgical care in LMIC, but may not be aware of ways to begin. We describe a short-term teaching partnership between visiting surgeons from academia and private practice with the long-term PAACS residency program in Makwasa, Malawi.

2. Design of the teaching activity

The teaching activity was determined exempt from review by the Institutional Review Board at Texas Tech University Health Sciences, El Paso. A short-term pediatric surgery education activity was arranged at Malamulo Adventist Hospital in January 2017. During this time, there was 1 visiting pediatric surgeon and 2 visiting general surgeons. The residency program chose anorectal malformations (ARM) and Hirschsprung's disease as topics on which they preferred focused teaching.

At the start of the teaching activity, a pre-test was given to the residents regarding the management of ARM and Hirschsprung's disease. During the 2-week period, the residents attended lectures and discussions that focused on ARM and Hirschsprung's disease. The visiting surgeons spent time on teaching rounds and in the operating room with the residents. At the conclusion, the residents completed a post-test and a questionnaire regarding the advantages and disadvantages of the teaching activity.

3. Long-term teaching structure

The PAACS program at Malamulo Adventist Hospital was accredited for training in general surgery by the College of Surgeons of East, Central and Southern Africa (COSECSA) in 2015. On faculty, there are 2 general surgeons, one certified by the American Board of Surgery and one certified by COSECSA. In addition, there is 1 obstetrician/gynecologist.

At the time of the study, there were 4 residents enrolled in the surgical residency at Malamulo Adventist Hospital and 1 resident rotating from another PAACS program. The residents were from Malawi, Liberia and Ethiopia. All residents intend to practice in their country of origin when they

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Table 1
Surgical cases encountered during the 2-week teaching activity.

General Adult and Pediatric Surgery
Abdominal Perineal Resection for rectal cancer
Supraclavicular lymph node biopsy for tuberculosis
Exploratory laparotomy & right hemicolectomy for colon cancer
Exploratory laparotomy & resection of gangrenous small bowel
Below knee amputation for trauma/septic leg
Right hemicolectomy for obstructing colon tumor
Exploratory laparotomy for incarcerated femoral hernia
Soave pullthrough for Hirschsprung's disease
Umbilical hernia repair
Exploratory laparotomy for perforated appendicitis
Inguinal lymph node biopsy for disseminated tuberculosis
Closure of elbow laceration/degloving injury
Open cholecystectomy
Repair of back laceration, s/p machete injury
Open prostatectomy for cancer
Bilateral orchiectomy for advanced prostate cancer
Repair of penile laceration after attempted self-circumcision
Bilateral inguinal hernia repair
Hydrocelectomy
Endoscopy
Upper Endoscopy (2)
Colonoscopy (2)
Cystoscopy with biopsy for bladder tumor (2)
Obstetrics and Gynecology
Cesarean Section (2)
Exploratory laparotomy for recurrent cervical cancer
Exploratory laparotomy and myomectomy for fibroids
Orthopedics
ORIF tibia fracture (2)
ORIF complex ankle fracture
ORIF distal radial fracture
Repair and fixation of thumb s/p machete injury
Wrist superficial tendon repair s/p penetrating trauma
Closed reduction of Colles' fracture
Non-operative/Wound Management/Minor Cases
Omphalocele Management
De-gloving injury of the ankle
Management of an open abdomen after uterine necrosis
Management of Fournier's gangrene
Prostate biopsy
Blunt trauma evaluation and management
Management of open extremity wounds, pediatric and adult (10)
Management of penetrating foot wounds (3)
Management of burn injuries (2)
Incision and drainage, hand infection
Incision and drainage, facial abscess
Incision and drainage, knee abscess
Incision and drainage, inguinal abscess in an infant

complete their surgical training.

The hospital has 275 beds and cares for 120,000 patients per year. 10,000 of these are in-patient admissions, 1200 major surgical cases and 800 minor surgical procedures. In general, the number of admissions has steadily increased over the past 3 years and the overall mortality rate remains around 2%. The most common admissions are for malaria, pregnancy, HIV, tuberculosis, pneumonia, stroke and trauma.

Pediatrics has shown the greatest increase in admissions, from 2212 in 2014 to 7180 in 2016. This increase may be due, in part, to a recent financial donation that has enabled free care at the hospital for children. The pediatric mortality rate has dropped from 3.6% to 1.2% during this time, reflecting that patients are more likely to present for care more quickly if they are not fearful of catastrophic health expenditure [3].

4. Implementation of the short-term teaching activity

All residents attended the lectures on ARM and Hirschsprung's disease. The mean pre-test score was 44% (± 4%) and post-test score was 91% (± 7%). All residents improved their score on the exam after completing the program ($P < 0.00025$). Table 1 shows the cases that were encountered during the 2-week period. There was a broad mix of adult general surgery, pediatric surgery, obstetrics/gynecology and orthopedics.

Residents were appreciative of the structured lectures and participation in the cases increased their confidence. Several residents expressed a desire for the teaching experience to be longer:

“It was an exciting lecture, focused on practical points from experience. It added a huge amount of relevant information and cleared up confusion that I had before. The procedures performed were in a very clear, step-by-step approach. For the next time, longer time to stay with us if possible and