Bridging the Gap Between Surgery and Gastroenterology: Is There a Role for the Medical Officer Endoscopist?

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Abstract

Gastrointestinal endoscopy is performed at few institutions in Sub-Saharan Africa. However the number of specialists who can perform these procedures is on the increase, and in Kenya, endoscopic services are available in the cities and some major towns. Medical officers are an integral part of the Kenyan health delivery system and are deployed to even the remotest parts of the country. Here we present retrospectively recorded details of 1919 procedures done by a medical officer resident endoscopy fellow over a two-year period. These included 1792 upper endoscopy procedures and 127 lower endoscopy procedures with low morbidity and mortality. Based on this experience, we suggest the possibility of teaching medical officers to perform diagnostic endoscopy under supervision. We believe that basic diagnostic endoscopy can be safely and reliably performed by a medical officer.

Key words: Flexible endoscopy, Medical officer, Diagnostic endoscopy,

Introduction

Endoscopy is a rapidly growing field in the practice of medicine. The number of facilities that offer these services have continued to increase both locally as well as internationally. Endoscopy is also a unique specialty that has an overlap between surgery and medicine. It is an important tool for investigation of gastrointestinal symptoms and management of some diseases, including upper and lower gastrointestinal bleeding.

The medical officer (MO) is trained to do both medical and surgical procedures. In the rural setting, more often than not, the MO is the next level caregiver for the patient after evaluation by a clinical or nursing officer. It is at this level that the patient is able to get basic surgical care, under the supervision of a surgical consultant when needed. The majority of the Kenyan population lives in rural and semi-urban settings where access to diagnostic services is typically very limited. In order to meet the needs of their patients, MOs must have a wide range of clinical skills.

All health practitioners are familiar with the stethoscope. This is basically an extension of the ear. In the same vein, the ultrasound machine is thought to be an extension of the examining finger. Initially, these machines were operated only by trained ultrasound technologists. It did not take long before trainee residents in obstetrics and gynecology were being trained in ultrasonography. Currently, surgery residents also learn to do basic ultrasonography including the Focussed Abdominal Sonography for Trauma (FAST) exam,

which has proven to be life saving. It is with this model in mind that we consider the flexible endoscope to be an extension of the eye, allowing us to visualize in a minimally invasive way different parts of the human body. This is a skill, which with the right training can be competently acquired.

Literature review

At Zomba Central Hospital in Malawi, Clinical Officers (COs) were trained in upper gastrointestinal endoscopy for 8 weeks (1). They underwent their training in a facility in Germany and they all had a minimum number (n=50) of required procedures to perform. From a review of 1732 subsequent procedures the authors concluded that delegating upper gastrointestinal endoscopy to clinical officers can be feasible and safe in a setting with a shortage of medical doctors, when adequate training and supervision are provided.

A number of reports have shown that when properly trained, general practitioners and family practice doctors can comfortably handle routine diagnostic endoscopy without supervision. This has been shown to lead to timely intervention and appropriate therapy. Numerous reports have also assessed nurse endoscopists. In a paper published in 2010 by Michele Limoges-Gonzalez et al a comparison was made between a nurse colonoscopist and two practicing physicians performing colonoscopies (2). The outcomes of screening colonoscopies performed by either the nurse (n=50) or the physicians (n=100) were similar. This study showed that with sufficient training, the nurse was able to effectively and accurately perform screening exams. A study done in the United Kingdom demonstrated that there was no statistical difference in effectiveness between upper gastrointestinal endoscopy done by nurses versus endoscopy done by physicians (3).

Methods

A retrospective review was done of all Tenwek Hospital endoscopy records for the period 2010-2011. This was a combination of the endoscopy computerized case logs and endoscopy clinic patient records over the same period. Procedures done by both the gastroenterology consultant and the resident endoscopy fellow were reviewed. The endoscopy fellow underwent 160 hours of supervised simulator training with assembled replica of the digestive tract and then observed around 250 procedures over a one-month period before going through a three-month training period. Data available was abstracted and processed via Excel for Microsoft Windows. The equipment used was from the Tenwek Hospital Endoscopy Unit, including video processor and monitor, Fujinon gastroscopes and colonoscopes, and equipment for manual and automated endoscope disinfection. Sedation was used for colonoscopy procedures, and upper GI endoscopy procedures were most often performed using topical lidocaine spray, without sedation. All patients were kept fasting for 6 hours prior to endoscopy.

Results

The MO endoscopy fellow performed 1919 procedures over two years. Of these 1792 were upper endoscopies and 127 were lower GI studies. 1083 (55%) were done by the fellow on his own with the supervisor present and 836 (45%) were done with the assistance of the supervisor. These procedures included: laryngoscopy (3), sigmoidoscopies (15), adrenaline injection for upper gastrointestinal bleeding (4), balloon dilation (2), variceal banding (27), biopsies (120), dilation of tumor and stent placement (125), foreign body removal (6), and other assisted procedures- snare polypectomy, sclerotherapy and Percutanous endoscopic gastrostomy (PEG) tube placement (12). The overall rate of ceacal intubation during colonoscopy was 90%. There were a relatively few complications: 3 gastric perforations and 1 death. All perforations were related to stenting procedures, and in 2 cases the tumor had formed a very tight malignant stricture that led to perforation during dilation. The third perforation, which led to mortality, was in an elderly patient with a Siewert type III tumor of the gastro-esophageal junction. He experienced a perforation during stent placement caused by the stent introducer going through the tumor. He was not a surgical candidate. He was admitted to the hospital's Intensive Care Unit and expired after 3 days. The consultant was present in all these cases and the complications were not related to the involvement of a trainee.

Discussion

The endoscopy fellow performed a large number of procedures over a relatively short period compared to the Zambia trial where procedures were done over 10 years. The majority of the procedures were upper endoscopies and this is because our endoscopy clinic does many more upper endoscopy than colonoscopy examinations. Forty-five percent of the procedures were done with the assistance of the consultant. This phase included the training

phase before the research fellow was confident enough to do procedures independently with the consultant present. These findings were similar to the findings in Zambia where the 39% of the procedures were done under supervision and 61% were done independently. The majority of the procedures were diagnostic procedures as only 15% of the procedures were interventional. The success rate of colonoscopy examinations reaching the cecum was also adequate at 90%, compared to the international standard, which is >95%. The low polyp detection rate of 1% reflects a low incidence of colon polyps in our population. Unlike other investigators, we did not interview the patients to determine patient satisfaction because this was a retrospective study (2). The mortality rates were also comparable with other publications as we had a very low morbidity rate of 0.1% and one mortality giving a mortality rate of 0.05%.

Different programs have different models for training in endoscopy. However, most insist on at a minimum attachment to a either residency or fellowship program

Supervisor involvement

In addition, different case volumes have been recommended depending on the accrediting body in order to achieve competency. The American Society for Gastrointestinal Endoscopy (ASGE) had the largest case volumes required per procedure type compared to the other bodies (4) (Table 1).

Table 1: Flexible Endoscopy Case volumes

	Esophageogastroduodenoscopy	Flexible Sigmoidoscopy	Colonoscopy
ASGE[5]	130	30	140
SAGES[6]	25	25	50

***ASGE**: American Society for Gastrointestinal Endoscopy, **SAGES**: Society of American Gastrointestinal and Endoscopy Surgeons*

The use of simulator models has also played a great role in training. The complexity of available models is, however, tied to greater costs, which puts computer based simulators out of reach in our context (4). However, we did fabricate and use our own mechanical model for initial training. This experience was especially useful in grasping control of the scope and maneuvering as well as building hand-eye coordination. It was a good bridge to performing clinical endoscopy. Our training paradigm involved both the use of mechanical models and hands-on experience under the guidance of a competent supervisor. In the Malawi experience all the trainees underwent a minimum of 50 procedures before being allowed to do them on their own. The point where the supervisor allows the trainee to be independent is really also dependent on whether he/ she feels that the trainee has shown satisfactory progress.

Training the MO in basic endoscopic procedures will not only increase the range of procedures that he/she is able to carry out, but it will also aid in facilitating earlier diagnosis and prompt intervention or referral. Many patients travel long distances to seek these services and in the process incur additional costs on top of their medical bills. In addition, the centers that offer these services in our country are located in the major cities and towns. In addition, specialist services are available in certain centers only. We are thus not advocating for the creation of a hybrid medical officer or reducing the cases that are referred to gastroenterologists or surgeons. Our aim is to emphasize that a well-trained MO can play a big role in the triage and treatment of patients needing endoscopic services. The MO would thus be expected to learn basic endoscopy that can be carried out safely. This would include:

- Flexible sigmoidoscopy- relatively short procedure time and easy to perform
- Flexible nasopharyngeal endoscopy: for evaluation of patients suspected to have laryngeal masses and other laryngeal pathology
- Laryngoscopy : assessment of the vocal cords
- Diagnostic Upper endoscopy: for quick assessment, especially in upper gastrointestinal bleeding

From table 1, it is evident that it is fairly easy to achieve the numbers required. In addition, from our own experience, the MO was able to carry out a large volume of examinations both with assistance and also without assistance but with supervision. Bearing in mind the learning curve for performing upper endoscopy, a middle ground can be found between the recommendations of these various societies and availability of resources and trainers. We suggest that a bare minimum of 50 procedures would be sufficient to be able to perform a diagnostic upper

endoscopy independently and 100 to perform a lower endoscopy. Flexible sigmoidoscopy is fairly simple to do and around 25 procedures would be sufficient. In addition, approval of the supervisor would ultimately be key.

In the Kenyan context, this will provide a vital bridge to provision of care, especially bearing in mind the amount of time and resources that will be saved if a patient can get an urgent endoscopic evaluation when it is indicated. It would also be necessary to train the endoscopist on basic endoscope equipment design, care of endoscope equipment and infection prevention as well as basic trouble-shooting and maintenance. The supervisor should also orient the trainee on the appropriate diagnosis of gastrointestinal symptoms, indications and contraindications for endoscopy, and treatment of complications of endoscopy procedures.

The question now becomes: Is all this feasible? We believe we have demonstrated that this idea is, in fact, feasible. However, there are some limitations that may hinder the realization of this concept quickly:

Limitations:

1. This paper looks at one trained MO endoscopy fellow, and may, therefore, be difficult to generalize this concept.
2. Cost and availability of endoscopy equipment, accessories, and disinfection equipment
3. Availability of an instructor/supervisor who has the necessary skills as well as the desire and time to train another endoscopist

Medical and surgical backup would be needed for the MO endoscopist for the evaluation and treatment of complications.

With the advancing of medical knowledge and increasing expenditure on the health sector, this is something that can be attainable. In the meantime, highly motivated institutions can purchase and maintain the basic endoscopic equipment required for these kinds of diagnostic procedures.

Conclusion

It is possible for a medical officer, if well-trained and supervised, to perform basic diagnostic endoscopy that can help with the triage, early evaluation and prompt referral of patients. This would be especially beneficial for patients with upper gastrointestinal bleeding or for the early diagnosis of potentially operable malignancy or other treatable diseases.

The authors have no conflict in interest.

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