

## Special Article

# Fibreoptic gastro-intestinal endoscopy at the Korle Bu Teaching Hospital, Accra, Ghana: a historical perspective

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## SUMMARY

Fibreoptic (or Flexible) endoscopy has revolutionized and completely transformed practice of gastroenterology, and many other medical specialties, over the past half century or so. At the Korle Bu Teaching Hospital, Accra the development of this facility has evolved gradually, especially involving specialists from the Departments of Medicine and Surgery since the 1970s. This article is an attempt to trace and record this journey and to highlight some of the problems and challenges yet to be overcome. It is an anecdotal account based on the authors' recollection with attempts at verification of important dates.

**Keywords:** fibreoptic, endoscopy, gastroscopy, colonoscopy, *H. pylori*, Ghana

## INTRODUCTION

Endoscopic examination of the upper gastrointestinal tract – mainly oesophagus, proximal stomach – was performed using a rigid oesophagoscope, and of lower colon using rigid sigmoidoscope. These rigid scopes – in use probably around 1860s - especially the oesophagoscope, were very uncomfortable to the patient and had several limitations. In the 1920s the first clinically useful gastroscope was produced by Dr Rudolph Schindler, German (Munich) clinician working with Georg Wolf (Berlin instrument maker). This was proximally rigid and distally partially flexible.<sup>1</sup> Schindler migrated to US during Nazi persecution in the 1930s and practiced at the University of Chicago.

A British Physicist, John Tyndall (1870) showed that a beam of light would follow the curved path of a stream of water. In 1927 another British scientist, J.L. Baird developed the idea of flexible glass fibres to propagate light. In 1954 Scientists at London's Imperial College published the construction of coherent bundle of flexible glass fibres capable of transmitting discernible image. Dr Basil Hirshowitz, South African born but trained in England and then working at the University of Michigan in collaboration with an undergraduate Physics student Lawrence Curtiss, designed a prototype of a fully flexible and functional fibreoptic endoscope in 1957.<sup>1,2</sup>

### Fibreoptic Endoscopy

At The Korle Bu Teaching Hospital fibreoptic endoscopy was initiated during the Deanship of Prof C.O. Easmon, the first Dean of the University of Ghana Medical School (UGMS), and is closely linked with Technical/Medical Research Co-operation agreement between the then Governments of Ghana and Japan signed in 1969 with the UGMS and the Fukushima Medical College.<sup>3</sup> Early in 1970 a visiting Japanese delegation, including Professors Minami and Hashimoto of Fukushima University, as the cooperating partners, for the first time, demonstrated the operations of the gastro-camera to interested Ghanaian gastroenterologists at the Korle Bu Teaching Hospital. The technology was not well developed at the time and did not excite much interest then.

In November 1976, the UGMS and Fukushima University of Japan jointly celebrated the centenary anniversary of the birth of Hideo Noguchi (1876) who died in Ghana during his research into Yellow fever (1928).<sup>3</sup> Following this, and through the close relationship between Prof Easmon and Prof H. Honda, a cardio-thoracic surgeon of the Fukushima Medical College, Ghana-Japan Medical Co-operation was formed, and which later led to the establishment of the Noguchi Memorial Institute for Medical Research in 1979.

Collaborative Research between the two Medical institutions (Ghana Japan Medical Collaboration) was initiated. Gastrointestinal endoscopy became the clinical focus of this collaboration. A project proposal- Endoscopic Study of Gastrointestinal Diseases in Ghana- by Prof E.Q. Archampong, Surgical Department of UGMS, was accepted by Japan International Cooperation Agency JICA for funding.

Gastrointestinal (GI) Endoscopy Study group was formed; members were Prof E.Q. Archampong (Surgery), Mr J.B., Quartey-Pappafio (Surgery), Prof A.K. Foli (Medicine) and Dr K.N.Nkrumah (Medicine), and later joined by Dr (now Prof) David Ofori -Adjei (Medicine). JICA provided the first modern Machida fiberoptic endoscopes to be used at Korle Bu Teaching Hospital in 1979 - one forward viewing and one lateral viewing plus light source. The first endoscopy suite was located in the east wing of the Main Surgical Theatre on the first floor of Surgical Block. The Matron- in-Charge was Matron Faustina Arthur. Japanese medical expert visitors usually came for one academic year and took active part in endoscopic procedures as well as imparting expertise on to the local endoscopy team. Among the early visiting experts were Doctors M. Kawanishi, Akira Nakajima and Satoru Watanabi all from Fukushima University Medical College. The first endoscope was a Machida side viewing gastro-duodenal fiberscope (FDS II) in 1979. The Machida endoscope had no water channel; hence water filled syringe was used to wash the lens; a separate air insufflation and suction unit was manually operated. Endoscopy was performed in the surgical theatre hence staff had to wear surgical gowns and boots or overshoes. Interestingly the few gastric biopsies that were taken at the time were examined by the histopathologist Dr (now Prof) J.T. Anim of the Pathology Department of the University of Ghana Medical School and he used to comment on the presence of Gram negative particles in submucosa but which were thought to be contaminants! (Could these have been the now famous *Helicobacter pylori* organisms described by Marshall et al in the 1980s?).

The next endoscope was a Storz oblique fibre- endoscope, which was rather awkward to operate but with time the endoscopists became quite adept at manipulating it. Unfortunately, it developed a fungal contamination of the lens channel and had to be abandoned. A new forward viewing fully flexible Olympus pan-endoscope (GIFP3) and a side viewing endoscope (JFP2) as well as Olympus colonoscope were provided around 1981. The Endoscopy Team actively participated in the first Ghana Japanese Research Conference at the University of Ghana, Legon, at which several papers on GI endoscopy were presented.

The first major article on Upper GI endoscopy with editorial comment was published in the Ghana Medical Journal (GMJ) in 1980.<sup>5</sup>

As part of the project, and funded by JICA, two members of the Endoscopy Study Group Dr Quartey-Pappafio, Surgeon and Lecturer, Department of Surgery and Prof E. Q. Archampong, Department of Surgery, UGMS, each spent a three months educational period at the Japanese Cancer Institute in Tokyo in 1986 for further hands on training in Gastro-intestinal endoscopy as well as taking part in the on-going cancer research. Prof Hashimoto also visited the University of Ghana Medical School around 1986 to assess progress of the Ghana-Japan Medical Collaboration.

Around the same period (1970s) Prof A.K. Foli, Department of Medicine & Therapeutics, a Gastroenterologist & Hepatologist, independently was performing abdominal laparoscopic examination of chronic liver disease, in particular hepatocellular carcinoma (HCC), using a rigid Storz laparoscope at the Fevers Unit, Department of Medicine & Therapeutics. He was later joined and assisted by Dr Kofi N. Nkrumah (1975) also of Department of Medicine & Therapeutics.

The Endoscopy suite was moved from the surgical theatre to the ground floor of the Radiology Department, as a Unit, mid-1996. This was facilitated by Prof E.D. Yeboah at the time he was Head of Surgical Dept. and was also performing urological endoscopy in the Unit. Matron Grace Adarkwa was in-charge of the Unit; she was later succeeded by Matron Beatrice Dzetepe and others. An Endoscopy Committee was also set up involving all Surgical and Medical staff engaged in endoscopy - gastrointestinal and urological - to oversee the running of the endoscopy unit. The Endoscopy Unit was relocated to its present site in 2007 mainly as a result of efforts by Prof Rudolph Darko, then Head of Dept of Surgery.

The nursing staff as well as ancillary staff, mainly from the Department of Surgery theatre, played an important role in the smooth running of the endoscopy service through assisting endoscopists, cleaning, sterilizing endoscopic equipment, counselling and reassuring patients about the procedure.

Fiberoptic endoscopy has now been superseded by video-endoscopy which has many advantages viz:- video screen with clearer and superior views, many doctors can view at the same time, unlike the pin hole views usually by the endoscopist only- sometimes with a teaching attachment. Pictures of important lesions can be stored electronically etc. unlike the Polaroid pictures obtained with Polaroid camera attached to the earlier endoscopes.

For several years endoscopy at Korle Bu Teaching Hospital was championed mainly by the Surgical specialists and few Physician specialists- Drs K.N.Nkrumah and (now Prof) David Ofori-Adjei- with very good mutual co-operation. Some of the surgical endoscopists include the late Mr Henry Aduful, Prof Simon Naeder, Prof Rudolph Darko, Mr Benjamin Baako, Prof Jonat Clegg Lamptey, Mr Adu Aryee. For this reason, medical students and some medical practitioners tend to perceive GI endoscopy as a surgical procedure although world-wide (globally) it is regarded mainly as a medical procedure. The number of medical endoscopists at Korle Bu is gradually increasing as more gastroenterologists are being trained.

The scope of GI endoscopy has evolved and expanded rapidly over the years and now includes many therapeutic procedures such as emergency treatment for acutely bleeding peptic ulcers, bleeding oesophageal varices, which formerly had high fatal outcome, colonic polypectomy, endoscopic retrograde pancreatography (ERCP), enteroscopy, and capsule endoscopy. Details of these procedures are beyond the scope of this article.

The Endoscopy Unit is managed by the Endoscopy Committee, which includes all actively practising endoscopists – both surgical and medical as well as Matron of Endoscopy Unit. For several years endoscopy training sessions, was spearheaded by Prof Rudolph Darko, former Head of Department of Surgery, in collaboration with faculty from Mayo Clinic, Rochester, USA, in particular Prof Mark Topazion, Prof Lewis Roberts (UGMS graduate), as well as Prof Joseph (Joe) Kolars (University of Michigan, American Gastroenterology Association-AGA), Prof Lars Aabakken (Norway) and others, have been held yearly. These have been attended by local gastroenterology residents as well as postgraduates from West African sub region – Nigeria, Ivory Coast, Sierra Leone. These training sessions have contributed to expanding endoscopy facilities locally and in West Africa.

Gastrointestinal endoscopy facilities are currently available in the other teaching hospitals in the country namely Komfo Anokye (KATH), Kumasi, Tamale Teaching Hospital (UDS), as well as several other private medical centres.

### Problems

Like any facility, some of the problems confronting the Endoscopy Unit at the Korle Bu Teaching Hospital include:

1. Inadequate equipment to cope with the large and increasing numbers of patients requiring this service, despite 5-days a week routine service as well as emergencies.

Emergency endoscopy within 24 hours for life threatening conditions is rarely possible because of inadequate support staff – especially nursing.

2. Maintenance of Equipment: This is a major handicap. As of now (or currently) there is no technical team “on the ground” as it were, to deal with major repairs – faulty equipment must therefore be sent abroad (UK or Germany) for repairs; this may take several weeks or months, thus causing the endoscopy service to be idle leading to piling up of cases.
3. Lack of Accessories: Several therapeutic endoscopic procedures e.g.oesophageal dilatation of strictures, stenting, endoscopic gastrostomy, cannot be performed regularly because of lack of requisite accessories.
4. Cost: GI endoscopy is not cheap; many patients cannot afford to pay for the procedure “up front” since currently it may not be covered by the National Health Insurance Scheme (NHIS). Patients requiring repeated procedures such as banding (or formerly sclerotherapy) for oesophageal varices, often default because of lack of funds and thus may be denied such life- saving procedure.
5. Endoscopic Retrograde Cholangio Pancreatography(ERCP): This facility is yet to become fully established.

### Future

Gastrointestinal (GI) endoscopy is now an indispensable facility in the management of many gastrointestinal and GI related disorders. Its scope continues to expand and it is important to make it affordable for patients who need it. Endoscopy training is essential for medical and surgical specialists or practitioners who are interested and endoscopy facilities must be more widely available at district level hospitals and not just confined to teaching hospitals and private medical facilities.

### REFERENCES

1. Haubrich W.S.: History of Endoscopy. Gastroenterology, Vol122 No 2 pg 591.
2. Cotton P.B; Rosenberry M.T: Fibre-Endoscopy of the upper Gastro-intestinal Tract. Br. J. Hosp Med 1971; 6 (Supplement) 52.
3. Afoakwa S.N.: Editorial: Ghana-Japan Medical Co-operation, GMJ Vol 16, No 1, Mar 1977, Pg 1.
4. Nkrumah K.N., Quartey-Papafio J.B; Kawanishi M; Archampong E.Q.: Upper Gastro-intestinal Endoscopy at The Korle Bu Teaching Hospital, Ghana Med. Journal 1980 Vol19, 96-98.
5. Quartey-Papafio J.B.: Editorial Gastro-intestinal Endoscopy at The Korle- Bu Teaching Hospital. Ghana Medical Journal 1980, No.19 pp66-67.

6. Nkrumah K.N; Archampong E.Q; Quartey-Papafio J.B; Ofori-Adjei D; Nakajima A: Acute Upper Gastro-intestinal Haemorrhage in Ghanaians- An endoscopic review at The Korle Bu Teaching Hospital.

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