

Improving palliative treatment of patients with non-operable cancer of the oesophagus: training doctors and nurses in the use of self-expanding metal stents (SEMS) in Malawi

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Abstract

Cancer of the oesophagus is the 6th most common cancer in Malawi. Nationwide only three hospitals are able to perform oesophagectomies, and there is no radiotherapy- or chemotherapy available. Owing to late presentation of the patients (sometimes in combination with comorbidities such as HIV/AIDS or tuberculosis) the vast majority of patients are not suitable for surgery. Self-expanding metal stents (SEMS) of the oesophagus provide a suitable palliative option to improve the quality of life for patients. This project took a nationwide approach, raising funds for both technical equipment and training of endoscopists and nursing staff throughout Malawi.

Introduction

Cancer of the oesophagus is the 9th most common cancer worldwide and the 5th most common cancer in developing countries with approximately 300 000 newly diagnosed patients every year¹. In Africa there is a high incidence of oesophageal cancer in parts of South Africa particularly in the Transkei districts and Central and Eastern Africa, especially in the central region of Kenya, Central Zimbabwe and - of special interest for our project - Malawi with an estimated incidence in Malawi of 0.6 per 100 000 per year²⁻⁵. Patients often present with dysphagia, but owing to the elastic properties of the oesophageal wall this is generally a sign of an advanced disease. Given that the oesophagus has no serosal layer to contain the local spread of the tumour, the cancer is locally advanced and inoperable in more than 80% of the patients at the time of first diagnosis⁶ so that the outcome is poor, with a less than 10% overall 5-year-survival rate⁷.

The treatment of cancer of the oesophagus includes radical surgical resection with oesophageal reconstruction. Results vary depending on the stage of the disease. Combined therapies, with down-staging of the tumour with neoadjuvant radio-chemotherapy followed by surgery, seem to be more successful⁸. There is significant morbidity associated with oesophageal resections^{9,10}. Palliative treatment modalities include chemo-radiation, argon-laser therapy, cryotherapy or self-expanding metal stents¹¹. Most of these are not available in developing countries because of resource and infrastructure constraints. In any case, recent advances in more aggressive radiochemotherapy for patients with late stage presentation have not provided much benefit¹². Self-expanding metal stents are an established palliative single treatment for patients with non-operable cancers of the oesophagus¹³ in countries without availability of radio-chemotherapy. Stents provide fast, complete and life-long improvement of the leading symptom - dysphagia - with a

reasonably low rate of early and late complications¹⁴. So far there has been only very limited experience with SEMS in Malawi. Reasons for this include lack of reasonably priced stents, lack of training in their utilization and poor resources available for palliative care follow up. The aim of this project was to build up the capacity for a nation-wide treatment programme for patients with non-operable cancer of the oesophagus in Malawi.



Map of Malawi with participating endoscopy centers

Methods

Training of doctors in placement of SEMS in Malawi:

The project was funded by generous financial support from The Lions Club of Blantyre, Press Trust Malawi and the Society of International Humanitarian Surgeons. Hospitals throughout Malawi performing endoscopies were invited to the training programme. Two workshops were organized - in Blantyre (at Queen Elizabeth Central Hospital and Mwaiwathu Hospital), and in Lilongwe (at Kamuzu Central Hospital). Professor Dr. Russell White, an international expert on the management of advanced cancer of the oesophagus (who has performed more than 1000 stent procedures) from Tenwek Hospital, Kenya was invited to train the endoscopists in Malawi. Running parallel to the surgical workshops were palliative care training seminars for nurses to support the programme in ongoing patient care. Stents, dilators, and guide wires were purchased from the project funds.

The SEMS are placed without use of an image intensifier during an endoscopy. The tumour stenosis is dilated after placing of a guide wire, the tumour is passed to check the correct position of the guide wire in the antrum, the size of the tumour is measured and the SEMS is introduced with an

applicator with a proximal and distal overlap of about 2cm. After replacement of the applicator the SEMS expands to a size of approximately 18 mm.

Nurse training included modules on breaking bad news, counselling the patients about dietary advice after stent placement, and pain management.

Hospital	Type	Number of beds	Number of general surgeons/endoscopists	Number of endoscopies per year
Queen Elizabeth Central Hospital	Central Government	1000	3	900
Kamuzu Central Hospital	Central Government	900	2	1200
Zomba Central Hospital	Central Government	500	2	200
St. Gabriel Hospital Namitete	Mission Hospital	220	2	450
Embangweni Mission Hospital	Mission Hospital	170	1	120
Nkhoma Mission Hospital	Mission Hospital			
Mwaiwathu Private Hospital	Private Hospital	60	2	300
Adventist Health Clinic Lilongwe	No data	No data	No data	No data
Daeyang Luke Mission Hospital	No data	No data	No data	No data
Blantyre Adventist Hospital	No data	No data	No data	No data
Malamulo Hospital	No data	No data	No data	No data

Table 1: Participating Endoscopy Units throughout Malawi

Results

During the workshop 18 doctors and 46 nurses from 11 hospitals were trained. Professor Dr. White gave the audience an overview about cancer of the oesophagus with special focus on south-eastern Africa. In a video-demonstration he familiarised the participants with the basic procedure of stenting. Possible early complications such as bleeding, pain and perforation and their management were discussed. Severe pain could be treated effectively with oral pain medication (e.g. liquid morphine) or diclofenac suppositories for mild-moderate pain. Bleeding after the dilatation normally subsides spontaneously. In case of a possible perforation (revealed by surgical emphysema or by clinical and radiological signs of a pneumothorax) the first step is to place the stent despite the complication – the covered part of the stent will seal the perforation, and if necessary a chest drain may be inserted. A patient with an oesophageal perforation should be kept 'nil by mouth' for two days, and a broad spectrum intravenous antibiotic such as ceftriaxone could be given. Professor White has successfully treated 95% of perforations in this way, without the need for operation.



Prof. R. White demonstrating the technique of stenting to participants at Queen Elizabeth Central Hospital/Blantyre.

Following the theoretical introduction, participants performed the placement of a SEMS, supervised by Professor White. Both real patients (who had fully consented) and a training model were used for the stent placements. At

Mwaiwathu Hospital in Blantyre stents were inserted with the assistance of an image intensifier. This is not available at the other institutions.

Blantyre	Number of Surgeons trained	Number of Patients treated	Number of Stents placed	Number of complications
Queen Elizabeth Central Hospital Mwaiwathu Private Hospital	9	9	10	0

Table 2: Trained doctors and treated patients during workshops.

The workshop at Blantyre was performed at Queen Elizabeth Central Hospital (QUECH) and at Mwaiwathu Private Hospital for doctors and nurses of the southern region of Malawi. At QUECH the theoretical background was taught. Afterwards placement of stents took place at both hospitals. The participants were able to see how safe stent insertion was possible despite differences between the resources of the two hospitals. Nine patients were treated with ten stents (in one patient the tumour had to be treated with two stents owing to tumour size) without any complications. The second workshop took place at Kamuzu Central Hospital at Lilongwe for doctors and nurses from the central and northern regions of Malawi. Again nine patients were treated, this time one of the possible complications occurred – a perforation during dilatation, with a right pneumothorax which was treated adequately with a chest drain. In this way participants were able to learn about the assessment and management of possible complications of stent insertion.

Discussion

In Malawi more than 90% of the oesophageal cancers found are squamous cell tumours¹⁵ (personal data). Beside the known risk factors – alcohol (especially spirits or local brewed beer) and smoking^{16,17} – there is some evidence that the consumption of maize is increasing the risk of squamous cell cancer of the oesophagus through contamination by aflatoxins (secreted from fungi that grow on stored grain) or even through a direct influence of maize on the mucosal layer of the oesophagus¹⁸. Co-infections with HIV, Human Papilloma Virus, schistosomiasis, EBV and CMV may also play a role and are subject to further investigations¹⁹⁻²³. Given the high frequency of oesophageal cancer, it is vital to improve the diagnosis and treatment of this disease.

The majority of patients presenting with cancer of the oesophagus in Malawi have inoperable disease at presentation. SEMS placement is a simple, effective method that can improve quality of life in this condition in resource limited settings. Adopting a nationwide approach required dedicated funds and logistical support but has enabled all endoscopy sites in Malawi to gain skills both in stent insertion and in adopting a palliative care approach to these patients and their families. Since the training, more than 120 patients have been successfully treated with SEMS with very good results in terms of improvement of dysphagia, and with a low rate of complications. These data will be published at the end of the planned follow-up of 200 patients after 12 months.

Complications are rare – early complications include bleeding, chest pain and perforation, while late complications include stent dislocation, tumour overgrowth or oesophagitis – the latter especially with a stent crossing the gastro-oesophageal junction. During the workshop one perforation happened and was treated adequately with a stent insertion, chest drain and iv-antibiotics. In a study in Kenya more than 1000

stents were inserted with an overall rate of perforations of approximately 3%²⁴. Tumour overgrowth could occur in up to 20% of patients²⁴; in our ongoing study, four patients out of more than 120 have had to be re-stented, but without any problem due to a blockage of the stent.

This project is unique because for the first time this technique will be used throughout Malawi in different endoscopy centres. With a lot of effort a nationwide approach was made possible to supply a whole country with a new technique. Early results have shown that the procedure is easy to learn for endoscopists and that it is safe even in resource limited countries. The success of this programme can be used also in other developing countries to improve the palliative care for patients with cancer of the oesophagus.

Contributions

AT and LV were responsible for the conception of the project and the organization of the training workshops for doctors. JB and LF were responsible for the conception and organization of the nurses' training programme. LV, AK and PK were responsible for fund raising and organization of the workshop. All authors contributed to the writing of the manuscript with AT as corresponding author mainly responsible for the literature research and writing of the article and for the tables and pictures.

Conflict of interests

The authors declared no conflict of interests.

Acknowledgments

We gratefully acknowledge Press Trust Malawi, Lions Club Blantyre and the Society of International Humanitarian Surgeon/Surgeons OverSeas which funded this project.

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