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Original Research

The surgical treatment of esophageal cancer in Sudan: A 100 consecutive cases

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HIGHLIGHTS

- In Africa most patients with esophageal cancer present with late stages of the disease.
- The incidence of esophageal adenocarcinoma seems to be on the rise.
- Despite financial constraints, adoption of simple measures markedly improve surgery outcome.

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ABSTRACT

Objective: Esophageal cancer is the most common gastrointestinal (GI) cancer in The Sudan. This study aimed to evaluate the outcome of the surgical management.
Methods: A 100 consecutive patients who underwent esophagectomy in Shaab Hospital in Khartoum during the period June 2003–Aug 2007 were studied.
Results: The mean age was 55 ± 14 years with an equal sex ratio. Fifty five per cent of patients presented with stage III&IV locally advanced and or metastatic disease. Sixty seven percent of the patients underwent a 2-stage resection, Lewis Tanner type while 27% underwent a 3-stage resection, McKeon operation and 6% had total gastrectomy with distal esophagectomy and roux-en-y reconstruction.
The 30 days postoperative mortality was 10%. In 75 patients who could be traced, the overall 5 years survival was 21% (n = 16) and the 10 years survival was 8% (n = 6).
Conclusion: There was great improvement in the early postoperative mortality from 27% in 1986 to 10% in this series. The surgical treatment offered a rapid symptoms relief which suited most patients coming from distant locations and couldn't afford to stay for long in the Capital as will be required if chemo-radiotherapy was used as sole or as a neo-adjuvant treatment.

1. Introduction

The incidence of esophageal cancer in Sudan is reported as 5.8 per100000 in the general population and 8.9 per 100000 in adults (>15 years) [1]. It accounts for between 37.7% and 60% of all GI cancers [2,3]. The majority of the patients are from the Northern region (mixed Arab-African tribes) with a low prevalence among pure African tribes in Southern Sudan [4].

Surgical resection continues to be the main therapeutic option for esophageal cancer worldwide [5]. Results of large multicenter studies reveal a 30 days mortality rate between 4.1 and 7.8% and pulmonary complication (being the most common) between 19.5 and 38.1% [6,7]. Thirty days mortality as low as 1% has been reported in patients registered to the Japanese Society for Esophageal Diseases registry in 2005 [8]. Mortality is significantly lower in high volume centers (performing more than 20 resections per year) when compared to low volume hospitals (performing less than 6 resections per year) 4.9% vs. 18% mortality rate respectively [9]. In Africa the situation is quite different. A highest incidence of 23.2 up 76.6 per 100000 population was reported from Eastern and South Africa, with steady increase in the reported incidence in Sub-Saharan Africa since 1950 [10,11]. The facilities for care are limited and the majority of the patients are ill, emaciated with a very low prospect of resection. Resection could be achieved in less than 50% of operated patients with an operative mortality of 16–28%, [12–14]. Despite the high incidence, data on the surgical

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treatment of esophageal cancer from the African continent is scarce. In 1993 we published our results in the management of a series of 101 patients with esophageal cancer. We reported an operability of 69%, resection rate of 87%, 30 days mortality of 27% and a survival at one and two years of 64% and 40% respectively [4]. The current study presents our experience in surgical treatment and outcome of esophageal cancer during the period June 2003–August 2007. This series followed a number of developments, renovation of the intensive care unit (ICU) and better trained staff, better anesthetic service with intraoperative monitoring. The author had a 4 weeks visit to see the anastomotic technique and optimum postoperative care in Japan with the implementation of a package of preoperative breathing exercise and active postoperative chest physiotherapy. This study reflects the lessons learned over two decades managing esophageal cancer in a resource poor environment following implementation of focused measures.

2. Patients and methods

2.1. Preoperative preparation

This prospective study included 100 patients who underwent esophageal resection in Shaab Teaching Hospital in Khartoum during the period June 2003–August 2007. This accounted for 25% of all patients with esophageal cancer presented to the unit during this period. All patients were operated upon by 2 surgeons working together. All clinical data was entered in a specially designed sheet. Patients were considered suitable for resection if they were able to walk independently for 100 m, with a body mass index$\geq$ 15, had no evidence of distant metastasis and had optimum work up.

The work up for surgical resection included full blood count, serum creatinine, blood urea, serum Na^{+}, K^{+}, Ca^{++}, liver function tests and random blood sugar. It also included a chest X-ray, electrocardiogram (ECG) and computerized tomographic (CT) scan of the chest and upper abdomen. Extra work up to assess fitness or the extent of the disease was done if deemed necessary.

Patients with absolute dysphagia had a preoperative feeding jejunostomy for nourishment and hydration as well as assessing resectability of the tumor during laparotomy (10 patients). Patients with bulky tumor on CT scan were sent for chemo and/or radiotherapy to down stage the disease and they were assessed thereafter for possible resectability. The chemotherapy included Cisplastin and 5FU every 3 weeks for an average of 4–6 cycles. The radiotherapy included between 30 Gy in 10 sessions or 40 Gy in 20 sessions. Most patients were emaciated and hence dose adjustment was always done to avoid complications.

2.2. Surgical techniques

The operative techniques entailed a laparotomy and right thoracotomy (Lewis-Tanner operation) for lower third and the gastroesophageal junction tumors and a modified 3 Stage McKeon operation for middle and upper third tumors. The latter technique starts with right thoracotomy and mobilization of the thoracic esophagus followed by synchronous abdominal mobilization and cervical anastomoses. In some patients with SewartIII gastroesophageal-junction tumors, resection was achieved through laparotomy alone. Warm saline-soaked abdominal packs were used throughout the procedure to maintain the body temperature and avoid hypothermia. All anastomosis were hand-sewn using an absorbable Vicryl 2:0 or 3:0 suture material. Intercostal infiltration of the thoracotomy incision with 0.5% Bupivacaine was done to minimize early post-operative pain. Patients were extubated immediately after surgery. Neither epidural analgesia nor central venous line catheter were used.

2.3. Postoperative management

Post-operative analgesia was achieved with intermittent dose narcotics. Postoperative care included IV fluids for 24–27 h and jejunostomy feeding starting in the second postoperative day with 10 mls/hr. and increased gradually up to 100–150 mls/hr. Local remedies were used for feeding e.g. soup, milk and juice. Due to lack of the formal jejunostomy tubes, size 16–18 Fr silicon Foley's catheter was used. Jejunostomy feeding continued for an average of two weeks and occasionally more if oral feeding was to be stopped or postponed. Oral feeding was started on the 10th postoperative day. Patients also received I.V 2nd generation cephalosporin for 48 h. All the patients had chest physiotherapy and breathing exercise and they were mobilized from day one postoperatively. Chemical thromboprophylaxis was given to selected patients. Postoperative monitoring comprised vital signs, input output charts and pulse oximetry. Invasive monitoring like (central venous pressure) CVP was not available.

A written consent was obtained from each patient for the surgery and any subsequent utilization of the data for scientific purposes; this was according to the regulation of the Health Ethics committee of the Sudan Medical council.

2.4. Statistical analysis

The data was analyzed using SPSS version 21,chi^2 was used to calculate difference between variable and *p value* of ‹0.05 is considered significant. Esotab Kaplan-Meier was done for survival analysis.

3. Results

Table 1 shows the results of the current study as compared to the previous one.

The mean age of the patients was 55 ± 14 (SD) years with an age range from 14 to 90 years. The male to female ratio was 51:49. Nearly all patients (n = 97) were from the Northern provinces (mixed races of Arab and African tribes) while only 3 patients were from pure African tribes. Fifty per cent of the patients were of blood group O and 35% of blood group A. Only 6 patients had positive family history of cancer. Other risk factors showed that 25 patients were smoker, 18 tobacco dipper and 10 had regular alcohol intake. Twenty five patients were hypertensive and 5 patients were diabetic.

CT scan was accurate in staging esophageal cancer in 55% of the patients in this series when compared with the intraoperative findings. Only 15 patients had Endoscopic Ultrasound (EUS) staging with an accuracy of 69%.

Tumors were predominantly in the distal thoracic esophagus (n = 65), supra carina in 25 patients and 10 patients had gastroesophageal tumors. Squamous cell cancers accounted for 66%, adenocarcinoma for 33% and one patient had mucoepidermoid cancer of the esophagus. There were 5 patients with adenocarcinoma with underlying Barret esophagus.

Using the TNM staging system, 85% of the patients presented with locally advanced disease (T3/4) and 51% of the patients had positive nodal disease confirmed with pathological examination. Patients with T4 were diagnosed intra operatively with local invasion of the pleura, diaphragm or pericardium and hence palliative resection was deemed appropriate. Seventeen percent of the patients received neo-adjuvant chemotherapy, 8% received radiotherapy, and 9% received both chemo and radiotherapy while 66% of the patients had resection as an initial treatment. Most patients