Objective

Breast cancer is becoming a major health problem and adoption of unified guidelines in the management is vital. This study is to review the surgical management of breast cancer in seven different units and compare it to breast cancer treatment guidelines.

Methods

This is a descriptive, retrospective, multi-centered, hospital-based, cross-sectional study reviewing the surgical management of breast cancer presenting to seven surgical and oncological units at Soba University Hospital (SUH), Khartoum Teaching Hospital (KTH) and the Radio Isotope Centre of Khartoum (RICK) in the period from January 2008 to January 2011. A total of 214 patients were enrolled. Data were collected from patient’s records and through direct interviews. Results were processed and analyzed using the SPSS 17.0 for Windows (SPSS, Inc., Chicago, IL, USA). To determine the statistical significance of difference, the Pearson test was used and probability test (P. value) with p<0.05 was considered as significant.

Surgical management of breast cancer among Sudanese patients

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Results
The mostly affected age group is 40-50 years, n=75 (35%). Eighty-two patients (38.3%) underwent mastectomy depending on fine needle aspiration cytology (FNAC) only for diagnosis of their disease. Invasive ductal carcinoma is the commonest type of cancer encountered (88.8%). Early breast cancer was reported in 63.1% of patients (tumor-nodes-metastasis (TNM) stage 1 & 2). Breast conservation surgery was done in 17.7% of patients. Involved resection margins decreases with the level of surgeon performing the operation. Only 23.8% of patients received neo-adjuvant therapy. In those with locally advanced breast cancer (LABC), 47.3% had mastectomy with axillary clearance.

Conclusion
There is a serious need for a national consensus on the approach to breast cancer management among all care providers to emerge with guidelines for the management in a multi-disciplinary approach.

Keywords: Breast cancer, Breast-conserving surgery, mastectomy

Introduction
Breast cancer is the most common cancer in women in UK. Excluding cancers of the skin, it is the most common cancer among American women, accounting for nearly one of every three cancers diagnosed(1). In Sudan, in 2006, the incidence of breast cancer was 34.5% of all female cancers(2). It is well known that once the diagnosis of invasive breast cancer has been made, the next step is resection if clinically feasible. Worldwide, breast conservation surgery is applicable in most patients with stage I and II invasive carcinomas, unless there is a clear contraindication. The exceptions are locally advanced and inflammatory breast cancer, in which neoadjuvant therapy may precede surgery. Also, neoadjuvant therapy may be considered if the patient desires breast conservation but the size of the tumor with regard to the breast i.e. tumor-to-breast ratio necessitates mastectomy initially. The choice of surgical procedure depends on several factors. These include patient risk factors for contralateral or metachronous cancer, histological type, mammographic findings, evidence of nodal or extra-mammary metastases, co-morbidities, and the patient's understanding of the various types of options available for treatment.

Axillary dissection plays an important role in the staging of breast cancer; however, the guidelines regarding its application are still controversial. Current standard of care mandates assessment of the axilla in all cases of invasive breast cancer. The National Surgical Adjuvant Breast and Bowel Project (NSABP) B-4 trial has demonstrated that axillary dissection improves rates of local control when compared to radiation. Nevertheless, it has not strongly showed a significant effect on overall survival(3).

The choice of treatment modalities has significance with respect to survival. It is observed in practice that patients’ management differs widely from health facility to another with the impact of that on the outcome of treatment of this disease in Sudan (e.g. locoregional recurrence). This study is conducted to evaluate this problem, its consequences and the possible solutions. The objective of this study was to review the different patterns of surgical management of breast cancer practiced in Sudan.

Patients and Methods
This was a descriptive, retrospective, multi-centric, hospital-based, cross-sectional study reviewing the surgical management of breast cancer presenting to five surgical and oncological units at Soba University Hospital (SUH), Khartoum Teaching Hospital (KTH) and the Radio Isotope Centre of Khartoum (RICK) in the period from January 2008 to January 2011. The study was approved by the Ethics Committee of the Sudan Medical Specializations Board (SMSB). There was no conflict of interest in regard to this study. Two
1. hundred and fourteen patients with breast cancer were enrolled in the study. Inclusion criteria included any patient presenting with early or advanced breast cancer or with loco-regional recurrence of breast cancer. There were no exclusion criteria. A predesigned data sheet was used to collect data from patient’s records. Data of prospective group of patients were collected through direct interview using the same data sheet. Independent variables included age, gender, residence, marital status, menarche, age at first pregnancy, number of pregnancies, use of contraceptive pills, family history, time lag between presentation and diagnosis, causes of this time lag whether due to patient factors, unavailable services or misdiagnosis. Variables also included the site and size of tumor at presentation, axillary staging, TNM stage, and method of cyto/histological diagnosis. Histological details included type of tumor, invasiveness, cellular differentiation, lymphovascular invasion, perineural invasion, mitosis, necrosis, intraductal component, extravascular invasion and safety of peripheral, and deep surgical margins. In addition, the place of surgery and level of surgeon were documented.

2. Dependent variables included the Nottingham Prognostic Index, type of surgery performed for the patient whether modified radical mastectomy, total mastectomy alone, breast conserving surgery (Skin sparing mastectomy, or wide local excision) +/- axillary clearance +/- reconstruction, or palliative procedures. Details of neo-adjuvant and adjuvant treatments for the patients were also included. Surgical units that carried the primary management of breast cancer were categorized into specialized and non-specialized according to the following criteria:

3. 1. Size of the unit: A specialized unit should have a minimum staff of a qualified surgeon and a non specified number of surgical registrars/medical officers plus house surgeons.

4. Associated services and non-core personnel: The unit must have a permanent access to a radiologist, oncologist, pathologist, and plastic surgeon. Those should be available with the necessary service needed.

5. Surgeon experience: The unit must have a leading surgeon with experience to take over the management of all spectrum of breast cancer disease from early to locally advanced breast cancer.

6. Case load: The unit should have at least 30 newly diagnosed cases and 30 cases operated annually.

7. Teaching: The unit must provide a teaching load to either junior staff or medical students.

8. Audit: The unit must have records for all patients with breast cancer and has auditing.

9. Follow-up: Follow-up data must be available with contactable address.

Data were processed and analyzed using the SPSS 17.0 for Windows (SPSS). To determine the statistical significance of differences, the Pearson test was used and probability test (P. value) with p< 0.05 was considered as significant.

Results

Two hundred and fourteen patients were included in this study, all were females. The mean age was 43.5 years (range 20-67 years).

The most affected age group was 40-50 years constituting 35% (n=75).

FNAC was used solely for diagnosis in 82 patients (38.3%). Core biopsy was performed in 31.3% (n=67) whereas open (Incisional and/or Excisional) biopsy was used in 26.5% (n=59); of whom 76.2% (n=45) were excisional biopsies. Histopathology reports were available in 94.9% of patients (n=203).

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Only 52.8 % (n=113) of the specimens were labeled.

All patients were diagnosed histologically as invasive cancers. Ductal carcinoma constitute
88.8% (n=190), while lobular type was seen in 5.6% (n=12) and mucinous type in 2.3% (n=5) of patients.

Early breast cancer (TNM stage 1 and 2) was reported in 63.1% (n=135), while 35.5% (n=76) presented with locally advanced disease and only 1.4% (n=3) patients presented with metastatic disease of the breast.

The type of surgery done was as follows; 40.7% (n=88) had mastectomy with axillary clearance, 8.4% (n=18) had mastectomy with axillary sampling, while 28% (n=60) had mastectomy (Fig 1).

Ninety-five surgical procedures were performed by senior consultants (44.4%), followed by junior surgeons in 51 cases, registrars in 45 and medical officers 10.7% (n=23).

Fifty-one patients received neo-adjuvant chemotherapy (23.8%) of whom 20 patients with LABC (26.3%). The majority of patients 76.2% (n=163) underwent surgery without receiving adjuvant treatment.

In 135 ladies having early breast cancer, 38.5% (n=52) had mastectomy with axillary clearance while 34.8% (n=47) had mastectomy only (Fig 2).

In 7 patients who had mastectomy with axillary clearance and three patients who underwent wide local excision (WLE) with axillary clearance, the resected margins were involved. In 39 patients (18.2%) the resected margins were not shown in the histology report (Fig 4).
When matching the level of surgeon performing the operation with the state of margins, 14.8% of patients done by consultants, 18% done by junior surgeons and 26% by registrars were involved (p=0.002 (Fig 5).

Fig 5: Level of surgeons in regard to state of margins.

In 51 patients who had neo-adjuvant chemotherapy, 78.4% (n=40) had mastectomy with axillary clearance. This was followed by immediate breast reconstruction in 3 patients. The remaining 11 patients (21.6%) had wide local excision with or without axillary clearance.

Discussion
Mastectomy was performed in (38.3%) of patients based on FNAC only and few patients were subjected to core or open biopsies. FNAC is especially valuable in evaluating cystic breast lesions and can be therapeutic if all of the fluid is removed. If the drawn fluid is clear it is highly unlikely that the lump is cancerous, if the fluid is bloody it must be sent for pathological analysis. In case of solid mass, cells are pathologically evaluated. Less than 30% of the masses biopsied are cancerous. Hukinnen et al(4) found that preoperative rate of definitely malignant diagnosis was 67% for FNAC and 96% for core needle biopsy (CNB) (p< 0.0001), and 95% and 99%, respectively (p=0.0173), when also suspicious findings were included. In patients with FNAC, an additional needle biopsy was performed for 93 and a surgical biopsy for 62 lesions. In the CNB group, a subsequent CNB was performed for 2 and a surgical biopsy for 33. The frequent need for additional biopsies raised the total expenses of FNAC over those of CNB. Multiple biopsies may also delay cancer surgery. It is therefore recommended to use CNB as the initial needle biopsy method(5). Accordingly, with the lack of an agreed upon protocol for approaching breast cancer patients in Sudan, there appears a serious need for discussion and agreement upon which policy is to be applied and the need for a multidisciplinary approach to discuss every patient’s situation.

There is difficulty in identifying the margins of the specimen to comment on marginal involvement by tumor cells. This has to be emphasized in the training of junior staff.

Regarding the surgical procedure, only 17.7% had breast conservation surgery with or without axillary clearance. In invasive breast cancer, breast-conserving surgery (BCS) followed by radiotherapy (RT) is still effective as mastectomy for treatment of early-stage disease(6).

Moreover, evidence is now supporting that breast-conserving surgery is comparable to mastectomy regarding the overall survival in those patients(7,8). It has been demonstrated that more than half of older patients across the
United States diagnosed as non-metastatic invasive breast cancer treated surgically receive BCS, however, barriers such socioeconomic disadvantage still exist\(^9\). However, some of those ladies presenting with early stage breast cancer were offered mastectomy with no clear contraindication to BCS like multi-focality, multi-centricity, history of prior radiation to the area of treatment, first or second trimester of pregnancy, persistent positive margins following attempts at conservation, small-size breast and large tumor > 5cm.

This significant disparity in modalities of treatment of breast cancer patients despite the recommendations reflects the lack of national or even regional agreed upon guidelines. Only 26.3% of those presenting with locally advanced breast cancer (LABC) received neo-adjuvant chemotherapy while the current trend is to give neo-adjuvant chemotherapy to patients with Stage III tumors (larger than 5 cm), inflammatory cancers, and cancers fixed to the skin or muscle as three cycles of chemotherapy followed by surgery\(^{10}\).

Few surgeons are performing axillary clearance when it is indicated. There is an urgent need for proper training especially of those who are resident in district and regional hospitals. Even BCS performance is rather unsatisfactory when done by junior staff. This is a more complex procedure and needs sufficient training to assure better outcome and decrease the local recurrence rates. The number of involved margins increases significantly with the decrease in the level of training of the performing surgeon reaching up to 84.6%.

Only 21.6% of patients, who had neo-adjuvant therapy were offered BCS which contradicts international practice where the introduction of neo-adjuvant therapy in the management of LABC increased the rate of conservation for patients with locally advanced disease\(^{11}\). Breast reconstruction was done only in 3 patients, a procedure that needs specialized training.

Care of breast cancer patients is currently through a "multidisciplinary approach" including a general surgeon, an oncologist, a pathologist, a psychiatrist, a nurse and social worker. The plastic surgeon is needed for reconstructive surgery\(^{12}\).

In conclusion, breast cancer management should be tailored to the needs of the patient and stage of the disease. There is no agreement on the approach to breast cancer patients so as to standardize the management. There is no consensus on which type of surgery to be done by what type and level of surgeons. This has implications on the management of patients. It’s high time to agree on national guidelines for the management of breast cancer in Sudan to offer all the ladies the same opportunities in treatment.

References
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