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Complications of breast cancer surgery at Conakry oncological surgery unit

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Abstract

To analyze surgical complications and their impact on the prognosis of operated breast cancer patients. This was a retrospective cohort study of breast cancer patients who underwent radical breast cancer surgery (RBS) or conservative breast cancer surgery (CBS) with axillary lymph node dissection. The oncological surgery unit of Donka National Hospital served as a framework for this study from January 2007 to December 2016. A total of one hundred and thirteen patients, including 111 women and 2 men were operated during the study period. The cancer was stage III in 92 (81.1%) cases. RBS was performed in 103 (91.1%) patients and CBS in 10 (8.9%) patients. Ninety-two point five percent

(92.5%) of patients had neoadjuvant chemotherapy, 68.5% had adjuvant chemotherapy, 33.6% had adjuvant radiotherapy and 39.8% hormone therapy. Surgery was complicated by intraoperative hemorrhage in 2 (2.1%) cases. Early postoperative complications included pain 47 (50%), seroma 14 (14.9%), delayed healing 13 (13.8%), hematoma 9 (9.6%), infection 2 (2.1%) and embolism 2 (2.1%). Late complications included relapse in 59 (52.2%), brachial pain in 23 (20.4%), lymphedema in 19 (16.8%) and shoulder movement limitations in 8 (7.1%). There was 27.1% of relapses occurred in patients with lymphedema versus 5.7% in the absence of lymphedema ($p=0.002$). The overall mortality was 59 (52.2%), including 4 (3.5%) postoperative cases. Operative pain, seroma, lymphedema and recurrence were the most common complications. This study showed that the high risk of death was related to the occurrence of relapse, more commonly seen in patients with lymphoedema.

Introduction

Breast cancer is the leading cause of consultation in the surgical oncology unit and accounts for 27.3% of all cancers [1]. Despite this high frequency of breast cancer, very few are operated on because of the advanced stage which requires neoadjuvant chemotherapy which is less accessible to patients. Breast cancer treatment is multidisciplinary, combining locoregional and systemic therapies. Breast surgery, combined with other methods of treatment, can cure patients. In developing countries, the frequency of complications related to treatment can reach 28.95% [2]. The objectives of this study were to analyze complications related to surgical treatment and their impact on the functional and vital prognosis of breast cancer surgery in our setting.

Methods

This retrospective cohort study included 113 patients, operated and followed up for breast cancer at the oncology surgery unit of Donka

National Hospital from 2007 to 2016. We included breast carcinomas and breast sarcomas for which a modified radical mastectomy or conservative breast surgery with axillary lymph node dissection were performed. Patient characteristics (age, sex) and tumor node metastasis (TNM) stage have been described. In stage III breast cancer, we performed neoadjuvant chemotherapy upfront modified radical mastectomy, whereas stages I and II breast cancer patients benefited from first-line surgery. Adjuvant treatments (chemotherapy, radiotherapy) were noted.

The follow-up time was defined by the difference, in months, between the date of the surgical procedure and the date of the last postoperative consultation. Surgical complications were classified into intraoperative (during operation) and early (within 30 days after breast surgery) and late (beyond 30 days after surgery) postoperative complications. Factors and corrective measures associated with the complications were described. Deaths and their cause were reported. We assessed the prognosis on the occurrence of relapse, with the recurrence and survival times.

All statistical analyses were performed using SPSS version 21.0 software (Inc., Chicago, IL). Qualitative data were represented as proportions (%) and quantitative as average (\pm standard deviation) or median with interquartile interval range (IQR). The Fischer and χ^2 test were performed to analyze factors associated with complications. Survival rate was calculated according to the Kaplan Meir method. The log rank test was performed to compare survival differences according to relapse. The difference was significant if the p-value was less or equal to 0.05.

Results

A total of 113 breast cancer patients were collected, including 111 (98, 2%) women and 2 (1.8%) men. Their age ranged from 20 to 85 years, with an average of 48.2 (\pm 13.75) years. There were 112 carcinomas and one sarcoma. The tumor was classified T3-T4 in 99 (87.6%) cases and stage III

accounted for 93 (82.3%) cases (Table 1). The average time to surgery was 6.4 months after the diagnosis of breast cancer (IQR 4.0- 8.0). RBS was performed in 103 (91.6%) cases and CBS in 10 cases (8.8%). The mean time to hospitalization was 7.9 days (\pm 4.2). One hundred patients (92.5%) received neoadjuvant chemotherapy, 74 (68.5%) adjuvant chemotherapy and 38 (33.9%) received adjuvant radiotherapy. Radiation therapy was achieved in 40% of patients with conservative surgery versus 33.3% with radical surgery. The mean follow-up time was 47.9 months (\pm 3.1). Intraoperative complications occurred in 2 (1.7%), early postoperative in 64 (56.6%) and late complications in 68 (60.2%) patients (Table 2).

Intraoperative complications were 2 cases of hemorrhage, including one case per axillary vein wound. Early postoperative complications included pain 47 (50%) case, seroma 14 (14.9%) case, delayed healing 13 (13.8%) case, hematoma 9 (9.6%) case, operative wound infection (OWI) 2 (2.1%) cases and embolism 2 (2.1%). In 13 (13.8%) cases, delayed healing was associated with cutaneous necrosis (7 cases), suppuration (2 cases) and seroma (4 cases). Late complications included 59 (62.8%) recurrences, 23 (24.5%) brachial pain, 19 (20.2) lymphedema and 8 (8.5%) shoulder movement limitations. Brachial pain was observed in 7 (50.0%) patients who had seromas versus 16 (16.3%) who did not have seromas ($p=0.008$). In addition, brachial pain depended upon lymphedema, 4 (21.1%) versus 4 (4.3%) ($p=0.027$). Of the eight patients with shoulder movements limitation, 17.4% occurred in patients who had brachial pain compared to 44.9% patients did not have brachial pain ($p=0.054$). During the follow-up time, 19 (20.2%) patients developed lymphedema and 59 (60.8%) relapsed. The recurrence was local (chest wall) in 2 (3.4%) cases, locoregional in 8 (13.6%) cases and metastatic in 32 (54.2%) cases. The median time to recurrence was 8.5 months (IQR 4.0-13.2). The recurrence was seen in 16 (84.2%) who had lymphedema versus 43 (46.7%) who did not have lymphedema ($p=0.005$).

During the follow-up period, 54 (47.8%) were alive while 59 (52.2%) died. Four patients (4.3%) died after surgery and the causes were pulmonary embolism (1 case), acute pulmonary edema (1 case) and cardiopulmonary arrest (2 cases). The five-year overall survival rate was 25%. This survival was 15% in patients with recurrence and 47% in those without recurrence, respectively ($p=0.005$).

Discussion

In this study, we analyzed the complications after surgical treatment of 113 patients who underwent breast cancer resection surgery from 2007 to 2016. The results showed a high prevalence of complications after curative surgery in breast cancer in our study. Zongo *et al.* [2] noted 28.95% of complications after breast cancer surgery in Burkina Fasso, while Ogundiran *et al.* [3] reported 14.5% in Nigeria. These differences may be explained by the fact that these studies do not take into account both intraoperative and postoperative (early and late) complications.

Despite the high prevalence of operative complications, we estimate that there is underreporting of bleeding cases in this study. Breast surgery, whether conservative or radical, is always accompanied by blood loss. Apart from active bleeding, the comparison of hemoglobin levels, before and after surgery, may thoroughly evaluate operative hemorrhage. These hemorrhagic complications can reach 25% during mastectomy for breast cancer [4]. Surgical hemorrhagic risk can be assessed according to breast volume and infiltration of breast and surrounding tissues [5]. The prevalence of hematoma varies from 5 to 10% [6]. The cause could be due to imperfect hemostasis. Patients were not exposed to antiplatelet agents or anticoagulants. In the majority of cases, it was a simple hematoma. Only one case required drainage of the hematoma.

Early postoperative pain is more common (60%) than late postoperative pain (10%) [7]. Nearly half of the patients had early postoperative pain. This

high frequency of postoperative pain, often nociceptive type was related to the non-availability of morphine. In the absence of morphine, paravertebral blocks could minimize these postoperative pains and even the consumption of analgesics [8]. Other patients had chronic pain in the chest wall, axilla or shoulder on the operated breast side. These pains were more common in patients who had seroma and lymphedema in this study. The brachial pain, although calmed by level 2 analgesics are also due to nerve damage by the sacrifice of Charles Bell nerve and that of the pectoralis minor. The persistent nature despite symptomatic treatment should indicate the prescription of co-analgesics such as antidepressants, anticonvulsants or neuroleptics. Two patients who had embolism were under heparin and observed early mobilization. Andtbacka *et al.* [9] reported 0.16% within 60 days after breast cancer surgery. OWI were less common in this study. The rate of OWI was similar to that of other studies in Nigeria and Ivory Coast, which found 4.4 and 3.4%, respectively [3,4]. In some studies, the rate OWI was more frequent, probably over 5% or more than 10% [10-12]. The low rate of infection in our study could be explained by the systematic antibioprophyllaxis treatment, the removal of the drain within 4 to 5 days after surgery, the precautions of asepsis and the quality of postoperative care. Consideration of Alzheimer classes and the comorbidities (diabetes, obesity, HIV infection) could also help to minimize the risk of OWI in breast cancer surgery [6].

After the pain, seroma was the most common early postoperative complication in this study. The seroma is a complication of both mastectomy and axillary lymph node dissection. Similar results were reported by Abass *et al.* [13] in Sudan, who found 15.6% seroma after breast cancer surgery. Other studies reported a high frequency of seroma, ranged from 33 to 43.6% despite axillary and prepectoral double drainage [14-16]. In contrast to our study, a correlation was found between seroma occurrence and obesity [17]. Lymphedema is a chronic and sometimes disabling complication. It was the second late operative complication after

chronic pain. The risk of lymphedema was correlated with the level of cleaning and lymph node involvement [6,8]. The frequency varies from 10 to 27% [4,18]. The cumulative risk over five years is 42%, according to Norman *et al.* [19]. The high frequency in our study could be explained by the fact that we perform axillary node dissection of the level II and III of berg because of advanced stages of breast cancer. In this study, there was no significant difference in the occurrence of lymphedema after adjuvant radiotherapy. It was the same as in the study by Ay *et al.* [18]. But adjuvant radiotherapy is a risk factor for lymphedema in other studies [20]. The evolution of lymphedema is sometimes enameled with episode of lymphangitis and cellulitis [21] as it was the case in one of our patients who had phlegmon in her arm.

Continuous physiotherapy is the only therapeutic weapon that minimizes disabling complications of lymphedema [6]. The limitations of shoulder movements in less than 10% of our patients could be related to insufficient rehabilitation of the upper limb. This complication is more common in some studies, reaching up to 48% [22]. They are more frequent in radical than in conservative breast surgery, even more so after axillary lymph node dissection. The introduction of early physiotherapy after breast surgery, by acting on the movements, adduction, abduction and shoulder rotation is the best prevention of this complication [23].

We observed a very high recurrence rate. Sahraoui *et al.* [24] observed in Tunisia, a recurrence rate of 4.84%. Buschanan *et al.* [25] found 8.8% of locoregional recurrence after mastectomy. The recurrence rate was high during the first year. This rate was high for advanced stages without significant difference. In a single institution review, factors found to be associated with recurrence in our previous study were age and stage at diagnosis [26]. Moreover, we found a significant correlation between the occurrence of relapse and lymphedema. To the best of our knowledge, there are no reported data on the relationship between breast cancer relapse and the onset of

lymphedema. Mortality was 4.2% in our study while it was zero in some studies in Nigeria [3]. In this study, all four deaths were related to cardio-pulmonary and thromboembolic causes.

Conclusion

Operative pain, seroma, lymphoedema and recurrence were the most common complications. This study showed that the risk of death was related to the occurrence of relapse, which is more frequently observed in patients with lymphedema.

What is known about this topic

- *Breast cancer surgery may cause complications such as recurrence, lymphedema and seroma.*

What this study adds

- *The occurrence of lymphedema was correlated with a locoregional recurrence.*

Competing interests

The authors declare no competing interests.

Authors' contributions

All authors contributed to the design and writing of this study. All the authors have read and agreed to the final manuscript.

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Tables

Table 1: characteristics of breast cancers
Table 2: distribution of the operative complications according to breast cancer surgery (n=113)

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Table 1: characteristics of breast cancers

Characteristics	Number	%
Histology type (n=113)		
Carcinomas	112	99.9
Sarcomas	1	0.1
SBR grade (n=54)		
SBR I	2	3.7
SBR II	38	70.3
SBR III	14	25.9
Moleculare profile (n=8)		
Positive ER	4	50.0
Negative ER	4	50.0
Positive PR	2	25.0
Negative PR	6	75.0
Her2 +	1	12.5
Her2-	7	87.5
Molecular subtypes (n=8)		
Luminal A	3	37.5
Luminal B	1	12.25
Triple negative	4	50.0
Primary tumor (n=113)		
T1-T2	14	12.4
T 3-T4	99	87.6
Regional lymph nodes (n=113)		
Yes	80	71.4
No	32	28.6
Metastasis (n=113)		
M0	99	87.6
M1	14	12.5
Stade TNM (n=113)		
Stage 1 et 2	18	15,9
Stage 3 and 4	95	84,1
ER: estrogen receptor; PR: progesterone receptor; Her2: human epidermal growth factor; SBR: scarff bloom richardson; TNM: tumor, node metastasis		

Table 2: distribution of the operative complications according to breast cancer surgery (n=113)

Complications	Type of surgery		Total n(%)
	CBS (n=10)	RBS (n=103)	
Intraoperative			
Heamorrhage	0	2	2(2.1)
Early			
Pain	3	44	47(50.0)
Seroma	1	13	14(14.9)
Delayed healing	0	13	13(13.8)
Hematoma	1	8	9(9.6)
Infection	0	2	2(2.1)
Falldown of drain	0	2	2(2.1)
Embolism	0	2	2(2.1)
Late			
Recurrence	2	57	59(62.8)
Arm pain	0	23	23(24.5)
Lymphedema	1	19	19(20.1)
Shoulder mouvements limitations	0	8	8(8.5)