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Mastectomy with immediate breast reconstruction after neoadjuvant chemotherapy and radiation therapy. A new option for patients with operable invasive breast cancer. Results of a 20 years single institution study

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Abstract

Purpose: To evaluate the feasability of immediate breast reconstruction (IBR) following mastectomy after neoadjuvant chemotherapy (NACT) and radiation therapy (RT) for operable invasive breast cancer (OIBC), in terms of incidence of local complications, locoregional control and survival.

Patients and methods: From 1990 to 2008, 210 patients were treated by NACT, RT and mastectomy with IBR for OIBC. One hundred and seven patients underwent a latissimus dorsi flap with implant (LDI), 56 patients a transverse rectus abdominis musculocutaneous (TRAM) flap, 25 an autologous latissimus dorsi flap (ALD) and 22, a retropectoral implant (RI) reconstruction.

Results: Forty-six (21.9%) early events were recorded: 20 necrosis, 9 surgical site infections and 6 haematomas, requiring further surgery in 23 patients. More necrosis were observed with TRAM flap reconstructions ($p = 0.000004$), requiring more surgical revision than LD reconstructions. Seromas represented 42% of early complications in LD reconstructions. Fifty-five patients presented with late complications (26.2%) with mainly implant complications (capsular contracture, infection, dislocation, deflation) (23.6%), requiring reintervention in 14 cases. There were more delayed surgical revisions in RI reconstructions ($p = 0.0005$). The 5 years overall and disease-free survival rates were respectively 86.7% and 75.6%. Sixty-four patients presented at least one recurrence (30.5%) with 5 local, 9 locoregional and 54 distant relapses.

Conclusion: This therapeutic sequence does not seem to increase the IBR morbidity nor alter disease-free and overall survival.

Keywords: Breast cancer; Mastectomy; Breast reconstructive surgery; Chemotherapy; Radiotherapy

Introduction

Neoadjuvant chemotherapy (NACT) in operable invasive breast cancer (OIBC) has been shown to increase breast conservation surgery (BCS). However, chemoresistant and multifocal tumours still require a mastectomy. As a consequence, today global management of these patients may include a breast reconstruction.

During the last decade, several studies have shown the advantage of immediate breast reconstruction (IBR) over delayed reconstruction in terms of cosmetic, quality of life and psychological aspects.[1] Oncological safety of IBR has been confirmed when performing mastectomies

Abbreviations: IBR, Immediate breast reconstruction; NACT, Neoadjuvant chemotherapy; RT, Radiotherapy; OIBC, Operable invasive breast cancer; LDI, Latissimus dorsi flap with implant; TRAM flap, Transverse rectus abdominis musculocutaneous flap; ALD flap, Autologous latissimus dorsi flap; RI, Retropectoral implant; BCS, Breast conservative surgery; DCIS, In situ ductal carcinoma; LABC, Locally advanced breast cancer; LR, Local recurrence; RNR, Regional nodal recurrence.

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for in situ ductal carcinoma (DCIS) and early-stage invasive breast cancers.[2,3] However, the management of operable locally advanced breast cancer (LABC) (stage IIb and III) is challenging and includes a multimodal approach with systemic therapy, radiotherapy (RT) and surgery. The ability to safely integrate postmastectomy RT into the reconstructive algorithm has become more complex and controversial. Moreover, postmastectomy RT indications have been expanded following the results of several randomized trials.[4,5]

The ASCO guidelines have concluded that there is insufficient evidence to propose definitive recommendations with respect to the integration of postmastectomy RT and breast reconstruction. Clearly, the need for RT cannot always be definitively established before surgery and postoperative RT seems to increase the rate of surgical complications as well as impact upon cosmetic results. Moreover, RT seems to be more difficult after reconstruction leading to some controversies.[6,7]

For patients with OIBC, eligible for mastectomy, CT and RT, we designed a different approach in order to match the patient's desire for IBR and the oncologic goals of the treatment. Hence, we decided to perform IBRs at the end of the therapeutic sequence after completion of CT and RT. This strategy, developed and used since 1990 in our institution, has allowed us to propose IBR to a larger number of patients, without interfering with CT and RT. The objectives of this retrospective study were to evaluate the incidence of local complications as well as the impact on the locoregional control of the disease, when using this strategy.

Patients and methods

We retrospectively studied the medical records of patients treated for OIBC at the Jean Perrin Cancer Centre from 1990 to 2008. All women with primary OIBC requiring mastectomy, CT and RT and desiring IBR were included in this study. Patients with local recurrence as well as T4 or inflammatory cancer were excluded. A total of 210 patients with clinical stage 0 to III disease were eligible for analysis.

Diagnosis and staging were based upon clinical examination, mammography and ultrasonography of the breast and axillary area. Histopathological characteristics were initially confirmed for all patients using core-needle biopsies and patients with palpable lymph nodes underwent axillary fine-needle aspiration cytology. The oncologic management was defined for each patient by a multidisciplinary committee in accordance with current therapeutic guidelines.

Two different cohorts of patients were identified: The first cohort was comprised of patients eligible for NACT, based upon core biopsy characteristics and clinical presentation (mostly large tumours). A mastectomy was performed because of multicentric disease, central location, large associated DCIS component or poor response to NACT. This cohort also included patients with clinical response to NACT but with failure of the BCS to get free margins for invasive or DCIS components.

The second cohort included women initially treated by BCS but requiring a secondary mastectomy in view of positive margins.

In both cohorts, the mastectomy with IBR was performed after CT and RT.

CT regimens varied over the studied period but all patients received anthracycline-based CT. Taxanes were introduced in our institution from 1997 onward (139 patients). HER2-neu status has been routinely determined since 1999 [119 patients]. Patients with HER2-neu abnormalities received neoadjuvant and/or adjuvant Trastuzumab treatment for 12 months. Therapeutic response to NACT was assessed by clinical examination and mammography with ultrasonography after 3 and 6 cycles of systemic therapy.

RT was indicated in keeping with current guidelines according to tumour size, multicentric disease, lymphovascular invasion and axillary nodes status. All patients received RT from a Cobalt unit or a 6-MeV linear accelerator, starting 4–6 weeks after completion of CT. The breast was treated with two opposing tangential fields. All patients received a total of 50 Gy on the whole breast and chest wall, over a five-week period with a daily target dose of 2 Gy. A boost dose to the tumour was usually delivered with an orthovoltage unit (10 Gy in five fractions).

Surgery was planned 6–8 weeks after completion of RT. The type of reconstruction was chosen according to the patient's body image. Radical non-skin-sparing mastectomy with level I and II axillary dissection and IBR were both performed by experienced oncological breast surgeons or in collaboration with a plastic surgeon.

Reconstruction techniques were:

- transverse rectus abdominis musculo-cutaneous (TRAM) flap
- latissimus dorsi musculo-cutaneous flap with implant (LDI)
- autologous latissimus dorsi musculo-cutaneous (ALD) flap
- retropectoral implant (RI)

TRAM flaps were all unipedicled. For RI reconstruction, skin closure was associated with abdominal advancement flap.

Patients with positive hormone receptors received hormone therapy for 5 years.

Surgeons evaluated postoperative outcomes at 2 weeks and 1 month and as frequently as necessary in case of complications. Complications were classified "early" when occurring within the first 30 days post reconstruction and "delayed" after 1 month. We reviewed anterior thoracic wall skin necrosis, flap necrosis, fat necrosis, wound haematoma, infection, capsular contracture and abdominal wall hernia. Infection was reported only when requiring