BACKGROUND

Breast reconstruction has become a standard of care for almost all women requiring mastectomy for breast cancer, a procedure which actually represent a 30% of surgical indication, an approximately unchanged rate. Skin sparing (SSM) and nipple-areola complex sparing mastectomies (NSM) are becoming widespread ablative techniques, being oncologically safe and cosmetically superior to not-sparing procedures.

An “immediate prosthetic” reconstruction after mastectomy ensures benefits under a psychological profile and doesn’t affect the oncological safety. Compared to the double stage reconstruction it allows a prompt cosmetic result, improves patients’ compliance, declines a second surgical step and reduces costs and complications. Compared to the autologous reconstruction, it is rather less demanding, doesn’t require a team skilled for microsurgical techniques or a special operative equipment and could be done by surgical oncologist, trained in oncoplastic breast surgery. It also allows a shorter time of surgery and postoperative hospital stay and doesn’t restrict an eventual following autologous reconstruction.

In this framework, an immediate reconstruction of large breast volumes after SSM and NSM is an emerging issue. Particularly, in these cases the immediate prosthetic reconstruction could be difficult, since the skin exceeds the volume achievable in the retropectoral pocket.

Indeed, until now reconstruction was provided by a double stage tissue expander/implant technique or by a single step autologous tissue one.

The introduction of titanized mesh may overcome the mentioned limits of reconstructive options, allowing an immediate prosthetic reconstruction even in the larger breast volume, after a conservative mastectomy.

In our pilot study we used the “Tiloop bra”, a tissue supporting polypropylene mesh with covalent bonded titanized surface, knitted out of monofilament fibers, with laser-cut and rounded edges. It is an extra-light material and shows a tissue–like flexibility and high biocompatibility, with a minimal inflammatory reaction to the alloplast.
MATERIALS E METHODS

We considered to employ first TILOOP®Bra devices in patients not foreseen to undergo post-mastectomy radiotherapy (PMRT). However, we investigated if PMRT was feasible after the mesh implant, since indication could unexpectedly emerge from pathologic exam.

Pre-surgical study

We realized a phantom, implanting a retromuscular prosthesis in a porcine hemithorax, supplying the cover defect in the inferior pole of the prosthesis with a Tiloop-bra. Everything was finally covered by a porcine skin layer.

A dosimetric analysis and a TC scan-based treatment simulation were performed by radiotherapists: the mesh implant did not affect the plane of treatment work out and showed only some minimal attenuation and scattering processes; therefore the magnitude of dose perturbations from mesh was not relevant for clinical findings.

We finally performed an MRI study on the phantom, assessing the absence of surrounding artifact, any small movement or increase of temperature of the implant, confirming the safety of breast MRI after mesh implantation.
MATERIALS E METHODS

Pilot series

From November 2010 to March 2011, we selected five patients eligible for Tiloop implantation.

Four patients were submitted to conservative mastectomies: one to NAC-sparing mastectomy and three to skin-sparing mastectomy. In all patients, an immediate prosthetic reconstruction was performed prolonging the pectoral coverage by Tiloop implantation. A contralateral breast augmentation and/or pexy was also performed to reach a bilateral symmetry in each patient.

Moreover, in a single patient, we resected the site of recurrence (LRR), occurred after a previous NSM and prosthetic reconstruction. The tumor infiltrated also the pectoralis major muscle: we resected a wide muscular area, removed and replaced the implant after capsulotomy and repaired the muscular defect by a Tiloop-bra (small size).
RESULTS

Patient, tumour and treatment characteristics are summarized in the table 1. The size of anatomical prosthesis implanted after mastectomy ranged from 410 to 520 cc. A medium or large size of Tiloop-bra was employed for immediate breast reconstructions, while a small size was used to repair the muscle defect after the local recurrence exeresis. Immediate good symmetry was achieved in each case.

Wound healing came about in fifteen days. Pain after implant referred by patients was minimal, ranging from no pain to moderate pain according to the Verbal Pain Scale (VPC) despite the large volume of implants. No early complication occurred after surgery. After pathologic exam one patient underwent post-mastectomy radiotherapy (PMRT), which was performed without complications, and actually she is at the third month of follow-up. A second patient (case n.5) will be submitted to radiotherapy after chemotherapy completion. In only one case ultrasound study, performed after one and three month from surgery, showed hypoechoic spots shaped as “string of beads”. The CT images revealed only a thin hyperintense image and MRI didn’t detect any specific signs. The median follow up was 23 weeks.
# RESULTS

**TABLE 1. Patient’s characteristics**

<table>
<thead>
<tr>
<th></th>
<th>CASE 1</th>
<th>CASE 2</th>
<th>CASE 3</th>
<th>CASE 4</th>
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<td>DCIS + PD</td>
<td>IDC + DCIS</td>
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</table>

IDC – invasive ductal carcinoma; DCIS – ductal carcinoma in situ; PD – Paget disease
TILOOP® Bra extra light titanized polypropylene mesh is an helpful surgical device which clearly improves reconstructive possibilities in the specific cases of medium and large breast after skin and NAC sparing mastectomies. It allows a single step prosthetic reconstruction without affecting the timing of post-operative treatments and the radiologic study (US, CT scan, MRI). In our pilot experience it improves post-operative pain and allows cosmetic satisfaction and a psychological good attitude. Obviously, we need to test larger series and to obtain more data about follow-up, late complications as capsular contracture in the not-irradiated cases (expected to be lower) and mainly after radiotherapy, and recurrence rate (expected to be comparable).

CONCLUSIONS

TILOOP®Bra extra light titanized polypropylene mesh is an helpful surgical device which clearly improves reconstructive possibilities in the specific cases of medium and large breast after skin and NAC sparing mastectomies. It allows a single step prosthetic reconstruction without affecting the timing of post-operative treatments and the radiologic study (US, CT scan, MRI). In our pilot experience it improves post-operative pain and allows cosmetic satisfaction and a psychological good attitude. Obviously, we need to test larger series and to obtain more data about follow-up, late complications as capsular contracture in the not-irradiated cases (expected to be lower) and mainly after radiotherapy, and recurrence rate (expected to be comparable).

REFERENCE