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РЕКОНСТРУКЦИЯ МОЛОЧНОЙ ЖЕЛЕЗЫ ПО ПОВОДУ РАКА С ИСПОЛЬЗОВАНИЕМ ЭНДОПРОТЕЗА, БИОЛОГИЧЕСКОГО ИЛИ СИНТЕТИЧЕСКОГО СЕТЧАТОГО ИМПЛАНТАТА

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IMPLANT-BASED BREAST CANCER RECONSTRUCTION WITH BIOLOGICAL MATRIC OR SYNTHETIC MESH

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Введение. За последние годы достигнуты значительные успехи в комплексном и комбинированном лечении рака молочной железы (РМЖ). Реконструктивно-пластические операции занимают главное место в реабилитации больных РМЖ и в настоящее время рассматриваются как этиотропное лечение психических расстройств, связанных с утратой женственности и целостности собственного органа. При одномоментной реконструкции молочной железы по поводу рака актуальным становится применение дополнительных материалов – синтетических и биологических имплантатов, способных заменить мышечные аутотрансплантаты и тем самым сократить травматичность, кровопотерю, время операции, избежать дефектов донорских зон. В статье представлен обзор литературы и результаты собственных исследований.

Материал и методы. В период с 2013 по 2016 г. в МНИОИ им. П.А. Герцена выполнены 104 одномоментные реконструкции молочной железы по поводу рака с использованием сетчатых имплантатов в 80 случаях, ацеллюлярного дермального матрикса – в 24 случаях после радикальных кожесохранной или подкожной мастэктомии. Средний возраст пациенток составил 47,2 года. 0 стадия РМЖ диагностирована в 2% случаев, I – 30%, IIA – 33%, IIB – 16%, IIIA – 15%, IIIB – 2%, IIIC – 2%.Титанированные сетчатые имплантаты использованы у 12 пациенток, полиэстеровые3D сетчатые имплантаты – в 68 случаях. Размер силиконовых имплантатов варьировал от 120 до 585 см^{3}и зависел от анатомических особенностей строения грудной стенки и молочной железы пациентки.

Результаты. Косметические результаты были оценены как отличные в 67,3% случаев, хорошие – в 19,2%, удовлетворительные – 7,7%, неудовлетворительные – 5,8%. Частота удаления силиконового имплантата составила 5,8% при использовании титанированного сетчатого имплантата и 0% – при применении полиэстерового 3D сетчатого имплантата. Серома диагностирована в 1,9% при использовании ацеллюлярного дермального матрикса и в 2,9% – при применении титанированного сетчатого имплантата. Некроз сосково-ареолярного комплекса отмечен в 1,9% при установке титанированного сетчатого имплантата. Инфицирование ложа имплантата определялось в 2,9% случаев. Капсулярная контрактура развилась в 5,8% случаев после применения лучевой терапии на реконструированную молочную железу.

Вывод. Биологические и синтетические материалы являются существенным дополнением к вариантам реконструкции молочной железы, во многих случаях – адекватной заменой аутологичных мышечных лоскутов при правильном отборе больных.

Ключевые слова: *рак молочной железы, кожесохранная радикальная мастэктомия с одномоментной реконструкцией имплантатом, подкожная радикальная мастэктомия с одномоментной реконструкцией имплантатом, ацеллюлярный дермальный матрикс, сетчатый имплантат.*

Introduction. In the recent years, considerable progress is achieved in the combination treatment of breast cancer (BC). Reconstructive-plastic surgery occupies the main place in rehabilitation of BC patients and is considered now as etiotropic treatment of mental disorders associated with the loss of feminity and continuity of organ. At the immediate breast cancer reconstruction, it becomes urgent to use additional materials: synthetic and biological implants capable of replacing muscular autotransplantats. The use of these materials allows minimization

of injury, blood loss, and surgery time, as well as assumes no defects of donor zones. The paper presents the review of publications and results obtained by the authors.

Material and methods. Since 2013 till 2016, specialists of the P. Herzen Moscow Oncology Research Institute made 104 one-time breast cancer reconstructions with the use of mesh implants in 80 cases, acellular dermal matrix in 24 cases after radical skin-sparing or subcutaneous mastectomy. Average age of patients was 47.2 years. Stage 0 breast cancer was diagnosed in 2% of cases, I – 30%, IIA – 33%, IIB – 16%, IIIA – 15%, IIIB – 2%, IIIC – 2%. Titanium mesh implants were used in 12 patients, and polyester 3D mesh implants were applied in 68 cases. The size of silicone implants varied from 120 to 585 cm^3 depended on anatomic features of chest wall and breast constitution.

Results. Cosmetic results were considered as excellent in 67.3% of cases, good in 19.2% of cases, satisfactory in 7.7% of cases, and poor in 5.8% of cases. The frequency of removal of silicone implant was 5.8% when titanium mesh implant was used and 0% for the polyester 3D mesh implant. Seroma was diagnosed in 1.9% of cases with the use of acellular dermal matrix and in 2.9% with the use of titanium mesh implant. Nipple-areola necrosis was observed in 1.9% of cases with the use of titanium mesh implant. Infection of implant site was observed in 2.9% of cases. Capsular contracture developed in 5.8% of cases after application of radiotherapy to the reconstructed breast.

Conclusions. Biological and synthetic materials form a significant alternative to existing ways of breast reconstruction and, in many cases, adequate replacement of autologous muscular flaps at the proper selection of patients.

Keywords: *breast cancer, skin-sparing radical mastectomy with immediate implant reconstruction, subcutaneous radical mastectomy with immediate implant reconstruction, acellular dermal matrix, mesh implant.*

УДК 618.19-006.6-089:618.19-77-089.844:615.462:678
doi 10.17223/1814147/60/03

INTRODUCTION

Breast cancer accounts for 21,2% of malignant tumors of the female population in the Russian Federation [1].

Considerable success in complex treatment of breast cancer has been achieved in recent years. The quality of life in patients decreases dramatically as a result of the radical treatment. Reconstructive plastic surgery plays a significant role in the rehabilitation of patients with breast cancer and is currently considered as causative treatment of mental disorders associated with the loss of femininity and integrity of one's own body [2–5].

About 50% of patients after mastectomy desire to restore their breast [6]. Recently there has been an increase in the number of patients wishing immediate reconstruction as it might help to avoid psychological collapse and depression connected with the loss of femininity [7, 8]. A radical subcutaneous and skin-sparing mastectomy is an alternative to radical mastectomy, which allows for primary rehabilitation if the selection of patients is correct.

A compulsory condition for a good result is to achieve symmetry on the contralateral breast, which means that surgery on it is necessary [9–11].

Methods of breast reconstruction can be classified into three groups: reconstruction with synthetic material (expanders and implants), those with patients' own tissues and a combination of them [11–14]. The first group includes two-step operations with primary expander dermotension and subsequent endoprosthesis replacement [15–17]. The second group of operations includes autografts such as thoracodorsal flap (TDF), TRAM-flap, DIEP-flap, gluteal flap, lateral flap of thigh and Rubens flap. The third group is considered to be a combination of these methods when, in addition to patients' own tissues, an implant is used as well as techniques with the formation of a submuscular pocket when using mesh or biological implants [18–20].

If immediate reconstruction is made, important anatomical structures are maintained: such as submammary fold, the amount of skin remains the maximum required for the reconstructive phase, which improves the overall aesthetic result of the operation [21].

Radical subcutaneous and skin-sparing mastectomy is an alternative to radical mastectomy, which allows for primary rehabilitation in the correct selection of patients. In 1917, W. Bartlett performed the first subcutaneous mastectomy with simultaneous replacement of the removed breast tissue by adipose tissue [22]. B.S. Freeman., V.R. Pennisi, J.E. Woods and others developed this surgery method for breast reconstruction by using silicone implants in combination with local tissues. Different muscle autografts are used in the process of reconstruction with silicone prosthesis (TDF, TRAM). However, this method is often associated with increased risk of infection: it requires separation of the vascular pedicle and can cause a number of complications such as long-lasting lymphorrhea in the donor area while separating the latissimus dorsi muscle flap, the scar in the donor area (often with the deformation of the contour of the back or the anterior abdominal wall), followed by reduction in the volume of the TDF due to denervation and reduction in TDF volume with preserved motor nerve, risk of marginal necrosis, liposclerosis, adiponecrosis when using TRAM-flap, risk of thrombosis of microvascular anastomoses in case of microsurgical TRAM technic.

Therefore, the use of artificial materials is relevant because they can replace muscle autografts and by that can reduce trauma, blood loss, operation time and prevent the defect of donor areas.

In 1950, Cumberland and Scales formulated the criteria for the ideal implant for the first time. Later, their ideas were developed and modified according to the requirements of modern surgery. Thus, the ideal implant should possess the following characteristics: chemical inertness, resistance to infection (monofilament materials), histological inertness, minimal irritant effect on the surrounding tissue, the constancy of physical-chemical and mechanical properties, elasticity and flexibility to maintain the integrity in the modeling and mechanical strength. It should also allow collagen to grow and unite with patients' own tissues; it should have sufficient pore size for ingrowth of connective tissue (>75 micron), should stimulate fibroblast growth, should be suitable for mass production and sterilization; its price should be affordable. The implant material must not be softened by the liquid extracted from the wound, it must not be a cause of inflammation or rejection, it must not shrink in the healing process, it must not cause allergy or sensitivity, be carcinogenic and initiate local complications [23–25].

The first propylene mesh – Marlex-50 – was introduced by Frencis C. Usher in 1958–59. Polypropylene mesh implants appeared in 1962, received the common name of "mesh" and started to be widely used because of high elasticity and optimal pore size. Thanks to the work of Lichtenstein (1989), polypropylene mesh, implants have become the standard material currently used in surgery [25, 27].

There are a large number of different types of mesh implants on the market [26].

In 2002, C. Amanti (Italy) was the first to report results of using polypropylene mesh implants for one-stage breast reconstruction after mastectomy during which Madden's technique was applied. This surgical technique was developed in 1994 and consisted in the formation of submuscular pocket which was formed with a mesh implant placed along the pectoralis major muscle edge.

In 2005, results were presented from 67 one-step and 6 delayed reconstructions with non-absorbable mesh implants to support the abdominal skin flap with extensive skin excision. 14 cases (19.2%) required a second surgical intervention under general anesthesia due to the movement of the prosthesis, displacement of the nipple-areola complex and elimination of capsular contracture.

M. Rietjens (2007) used non-absorbable mesh implants for tightening and maintaining the abdominal skin flap in extensive excision of the skin of the breast – "supporting technique". During the operation, a broad flap of tissue from anterior abdominal wall on anterior surface of rectus abdominis was mobilized. In the same way, skin and subcutaneous adipose tissue at the bottom edge of mastectomy wounds were mobilized. The mobilized flap of an anterior abdominal wall was pulled up and stitched to a triangular non-absorbable mesh implant fixed at the level of forming inframammary fold. The implant was pulled up and placed behind the pectoralis major muscle, its upper edge fixed to the rib cartilage by two prolen`s seams. The prosthesis was installed at the front of the grid and behind the pectoralis major muscle. Basing their opinion on the results of the studies, the authors pointed out that the advantage of this operation is the ability to perform immediate reconstruction with extensive excision of the skin without prior skin stretching by expander and using a musculocutaneous flap.

H.D. Loustau put across an idea to perform breast reconstruction after radical subcutaneous mastectomy with a silicone implant with the formation of intra-muscular pockets using a mesh implant. The subpectoral pocket included the pectoralis major muscle (medial border), the serratus anterior (lateral margin) and the rectus abdominis muscles (lower edge). The author called this technique the "guaranteed subpectorally pocket" [28, 29]. In his study, the author analyzed 34 breast reconstructions after subcutaneous mastectomy due to cancer treatment with the implantation of absorbable polyglycol mesh implant and silicone implant (the size is from 270 to 375 cm^3). The average period of monitoring was 2.8 years. The formation of capsular contractures, infections, failures of the walls of the pocket for the implant were not observed.

R. Wettstein used the method of forming the pocket worked out by H.D. Loustau. After a series of operations, it was recommended for further use [30].

Aesthetic results after breast reconstruction may be unstable in nature. Ptosis of the prosthesis may occur due to the individual characteristics of the connective tissue and its tendency to hyperextension [31]. V.G. Mishalov indicated that a significant percentage of recurrence of gravitational ptosis after mammoplasty reflects the quality of fastening tissue, and remains an unsolved problem. The main idea proposed by Mr. V. Mishalov and co-authors in their method was to stimulate the formation of the connective tissue forming a "lock" to fix soft tissue to a stable structure using [32].

Currently reticulated polymeric titanium and polyester implants are widely used for reconstructive surgery, including breast reconstruction. Titanium mesh implants are made of a unique patented composite material with covalently bound coating

titanium. Macroporous prosthetic mesh consists of polypropylene monofilaments with a covalently bound coating of titanium (30 nanometers, while retaining the flexibility of the polymer), tensile strength and elongation correspond to the dynamics of body tissues and it is used to support and enhance connective tissue structures and ligaments.

The main methodical purpose of using mesh implants in breast reconstruction is to increase subpectoral space for the installation of silicone prosthesis, reduction of the pressure on the skin, to ensure good coverage of the prosthesis. Due to the formation of a new tissue layer, whose cells grow out through the pores of the mesh implant are surrounded by patients' own tissue. The frequency of postoperative complications when performing one-step breast reconstruction after subcutaneous mastectomy with mesh implant and silicone implant is not higher than the one observed during other types of reconstruction [33–35], which allows to implement this method.

Plastic and reconstructive surgery has been continuously developing, improving the existing methods due to the advanced scientific research. A promising area in the reconstructive breast surgery is the use of biological implant acellular dermal matrix (ADM). ADM was originally designed to correct the shape of the breast after augmentation to eliminate all roughness and contour abnormalities. Its use in implantation became popular after Brueing et al. published several cases of its application to cover the lower lateral pole of the breast [36]. Several cases of the application in two-step reconstruction with tissue expander were published later.

The use of ADM became common in 2005. Using biomaterial made it possible to create a pocket for prosthesis/tissue expander without using anterior serratus muscle or rectus abdominis [37].

The advantages of ADM are as follows: it decreases the postoperative pain syndrome intensity, prevents damage of the donor area and improves aesthetic results [36–41]. However, there are indications in medical articles about an increase in the number of postoperative infectious complications, seromas, and explantations [37, 39, 43–45].

Nowadays, the majority of dermal matrices used for breast reconstruction include the human matrix, porcine matrix or matrix from cattle. Human matrix is made by Alloderm (LifeCell, Branchburg, NJ), Flex HD (Ethicon, Sommerville, NJ), Neoform (Mentor, Santa Barbara, CA), and DermaMatrix (Synthes, West Chester, PA);the porcine matrix – by Strattice (LifeCell, Branchburg, NJ) and Permacol (Covidien, Boulder, CO). The matrix of cattle is only presented on the market in the form of Surgimend (TEI Biosciences, Boston, MA). ADM can be used in immediate and delayed breast reconstruction. Immediate reconstruction has certain advantages: preservation of skin case and favorable conditions for the formation of a pocket for a prosthesis [46].

The method of using ADM was firstdescribed for one-step reconstruction with a permanent implant to reduce or eliminate installation of a tissue expander. In the original report of Breuing as well as in five subsequent randomized studies the effectiveness and success of immediate reconstruction when using ADM were proven [38, 41, 42, 47–49]. In these retrospective studies, the overall incidence of complications was between 6.9% and 25%. Breuing reported 6.9% (2/30) of complications after primary reconstructions, Zienowicz's et al. reported 25% (6/24) of complications due to the necrosis of skin grafts, the treatment of which was carried out using local methods. The greatest review of one-step reconstruction with implants and ADM was presented by Colwell et al.: the complication rate was 14.8% (49/331), including 9.1 percent (30/331) cases of the necrosis of skin grafts. Skin graft necrosis that required the removal of the prosthesis occurred in 1.5%. These results demonstrated the successful application of ADM in one-stage breast reconstruction.

A proper selection of patients is required to achieve the best possible results. Excellent condition of skin grafts is required. Moreover, patients should be informed that for the best possible result the breast size has to be similar to natural or smaller 48].

One of the advantages of ADM is the reduction of pain syndrome due to the reduction of pectoralis major muscle tension [36, 50].

The use of ADM was first described for capsular contracture treatment. Currently, there are no data proving the prevention the development of capsular contracture when using ADM [36, 41, 51–53]. Some authors point out that ADM provides the best aesthetic results, but there are only 2 studies that support this assertion. Spear et al. got identical results according to the reconstruction with implants and ADM (a mean of 3,68 out of a possible 5) and the contralateral unreconstructed breast(a mean of 3.98 out of a possible 5) ($p = 0.3$) [54, 55]. Vardanian et al. also showed that the overall aesthetic result, evaluated by independent observers on a scale of 1–4 was, statistically, significantly larger in the group with ADM's – 3.26, compared with the group without ADM – 2.87. According to the author, the submammary fold was in the best position in the group with ADM – 3.35, compared with the group without ADM – 2.94 [50].

Complications in the application of ADM are similar to those of breast reconstruction with implants, and should be divided into early ones – hematoma, seroma, infection, necrosis of skin grafts, rejection of the prosthesis, and late complications such as asymmetry, wrinkling of the implant, wrong

position, capsular contracture, and late infectious complications. Hematoma occurs in less than 5% of cases, and treatment of that is standardized for all reconstructions. ADM implies the increased risk of developing seroma, and there are two studies which have shown a statistically increased frequency of that [36, 40]. Chun points out the development of seroma – 14.1% in the group with ADM compared with 2.7% in the group without ADM [36]. Similarly, Parks reported a 29.9% seromas in ADM group and 15.7% in the group without ADM [40]. However, there are many studies that show no statistically significant difference in the development of seromas caused by ADM [37, 41, 45, 52, 54, 56]. Thus, according to Liu et al., seroma frequency was 7.1% in the ADM group versus 3.9% in the group without ADM, while according to Lanier et al., it was 13.4% versus 6.7%, respectively, the data did not reach the statistical significance. Taking into account these conclusions, it should be pointed out that in order to minimize the risk of seroma development the installation of vacuum drainage without its premature removal should be used.

Infectious complications when using ADM are observed in a high percentage of patients – 35.4 percent, which may be explained by the presence of the second foreign material, in addition to the endoprosthesis. There are many reports that demonstrate increase in the number of infectious complications in patients with ADM [36, 37, 44, 45, 57–59]. Timely antibiotic therapy is important.

Contraindications for ADM use are similar to those with endoprosthesis mammoplasty. Selection factors include an assessment of the need for unilateral or bilateral reconstruction, body type, body mass index, width of the chest, comorbidities, and psychological portrait of the patient. Ideal candidates for reconstruction with implants and ADM are skinny patients who are undergoing bilateral reconstruction after adequate mastectomy skin flaps and skinny patients with breast without ptosis undergoing unilateral reconstruction. With increasing size and ptosis of the breast, it is more difficult to achieve symmetry, therefore contralateral mastopexy or reduction mammoplasty become necessary

Nowadays, there are no absolute contraindications for ADM using, however, obesity, smoking and breast size more than 600 grams mean increased risk of postoperative complications. The combination of ablasticity and surgery reconstructive techniques is necessary to achieve the best results. All cuts must be pre-marked, submammary fold must be marked and, if possible, preserved during the mastectomy, skin flaps should be thick enough to preserve adequate circulation and to prevent possible loss of the skin graft [37, 44, 45].

In our opinion, the selection criterion for strengthening the lower slope of the breast in subcutaneous or skin-saving mastectomy with silicone implant in the cancer treatment with one-step reconstruction is the value of pinch-test. When the value of the pinch-test is more than 0,5 cm, a synthetic implant and ADM can be used. When the value of the pinch-test is less than 0,5 cm, the preference should be given to ADM.

MATERIAL AND METHODS

During 2013–2016, in the Department of Oncology and reconstructive surgery of breast and skin of the P.A. Herzen Moscow Cancer Research Institute, 104 implant-based immediate reconstructive operations with mesh and ADM were performed in breast cancer patients after subcutaneous or skin-sparing, nipple-sparing mastectomies. The average age of patients is 47, 2 years old. Stage 0 was diagnosed in 2% of patients, I – 30%, IIA – 33%, IIB – 16%, IIIA – 15%, IIIB – 2%, IIIC – 2%. To strengthen the lower slope of the breast, operated on for cancer, titanium meshes were used in 12 cases and polyester 3D meshes in 68 cases, acellular dermal matrix Permacol – in 24 cases.Silicone implant volume ranged from 120 to 585 cm^3 and depended on the individual anatomy of the patient. Mutations of the BRCA1 gene were found in 5 patients, and therefore prophylactic contralateral subcutaneous mastectomy was made with the strengthening of the lower slope of the reconstructed mesh implant. To achieve symmetry, augmentation of the contralateral breast was performed in 8 cases.

The technique of using a biological implant in breast reconstruction

After mastectomy, and careful hemostasis, pockets of skin were formed (Fig. 1, 2). Inferolateral part of the pectoralis major muscle was separated from the anterior chest wall. By using electro-dissection the subpectoral pocket was formed, up to the marked levels on the perimeter of the modeled breast. After successfully creating the subpectoral pocket we performed preparation of ADM sheet, according to the manufacturer's recommendations. On the next stage ADM was hemmed to the chest wall with reconstruction of the lateral and lower submammary fold (Fig. 3). Most surgeons prefer using absorbable seam materials, in particular, 2-0 polydioxanone (PDS) or Vicryl 2-0. After reliable attachment of the ADM to inframammary fold, the width of the pocket was measured in order to select a prosthesis. After careful hemostasis in the pocket and a prosthesis placement, the edge of ADM was hemmed to the

bottom and the side edges of the pectoralis major muscle. For a reliable cover, silicone prosthesis was isolated on the serratus anterior and ADM was fixed to the last one in the lateral section. In all cases, a closed space was formed with a tight fit of the prosthesis, but without pressure on the skin flaps (Fig. 4, 5). The wound was seamed in layers, with two vacuum drains left (Fig. 6).

The reconstruction step when using silicone implant and ADM

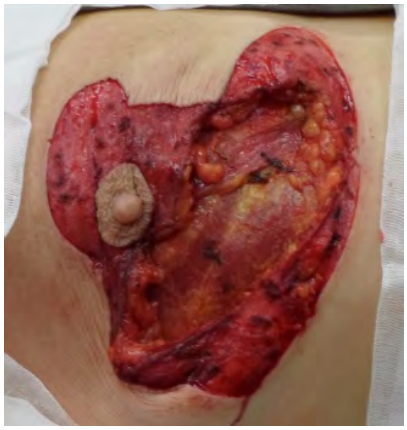


Fig. 1. The wound view after subcutaneous mastectomy and axillary subscapular lymph node dissection

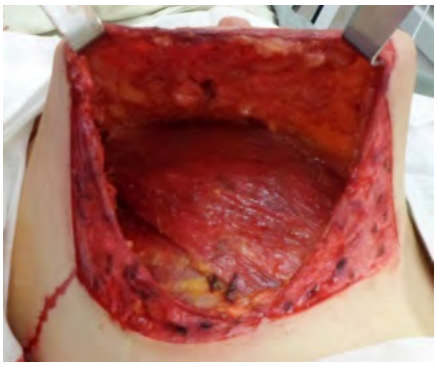


Fig. 2. The wound view of the cavity after completing a subcutaneous mastectomy

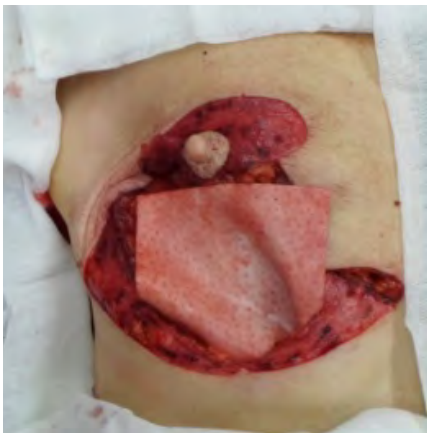


Fig. 3. ADM is fixed to the inframammary fold

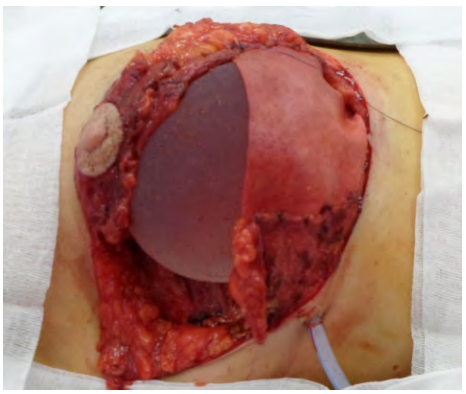


Fig. 4. The step of pocket forming using the major pectoral muscle, and acellular dermal matrix, serratus anterior, fascia of musclus rectus abdominis

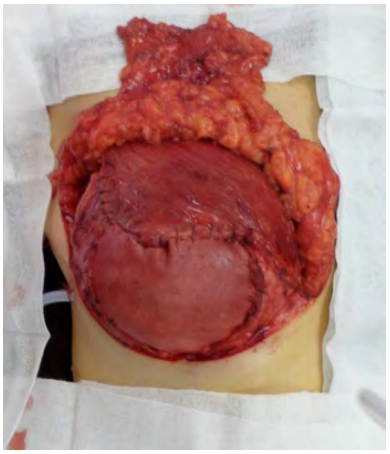


Fig. 5. The final view of the pocket formed with endoprosthesis

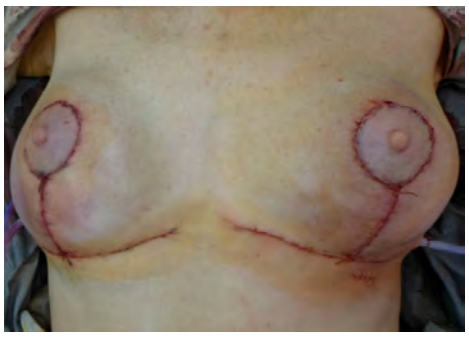


Fig. 6. The view of postoperative wounds

The technique of radical subcutaneous mastectomy with simultaneous reconstruction with the mesh implant and silicone implant

According to the preoperative marking by periareolar line in the case of a subcutaneous mastectomy or by two radial cuts at skin-saving mastectomy, we dissected the skin and subcutaneous tissues were cut. Skin flaps were separated widely. Mammary gland with a tumor was mobilized and removed subcutaneously. Axillary-subscapular tissue

was removed. In case of a lymph node, axillary-subclavian-subscapular lymphadenectomy was performed. The pectoralis major muscle was separated from the pectoralis minor to 3 and 9 o'clock positions. Mesh implant was fixed to the great pectoral muscle edge by non-absorbable suture atraumatic thread. The silicone implant was placed under pectoralis major muscle and covered by mesh implant. A duplicator of the mesh implant was formed. At the lateral side, mesh was fixed to anterior serratus muscle to prevent its displacement. Vacuum drainage was placed in the space of the prosthesis and axillar region. After an aseptic dressing, patients were asked to wear elastic compression underwear.

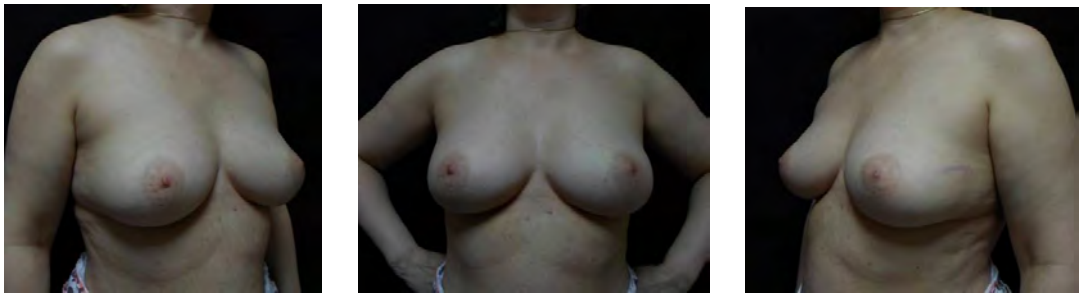
RESULTS

In the group of patients with ADM, the development of skin grafts necrosis at lower quadrants was found in 1 patient at the early postoperative period. Because of that, three necrotomies with the imposition of secondary sutures were carried out with a temporary positive result. Progressive marginal necrosis required secondary sutures, autodermoplasty and subsequent replacement of the cutaneous-subcutaneous flap from the anterior chest wall, which led to good result. It should be pointed out that the development of seromas and infectious complications in this patient were not observed, and 2 courses of antibiotic prophylaxis were conducted. The only change in the aesthetic result is only due to the appearance of additional seams after autodermoplasty in the area of the lower quadrants; significant changes in the shape of a breast were not marked. The presence of ADM, which covered the endoprosthesis, allowed to avoid the re-implantation of the last one.

The development of a long-standing small seroma in the central parts of the postoperative scar occurred in 1 patient during early postoperative period. A puncture was performed and topical treatment provided with seroma regression noted a month after surgery. In 1 case, during adjuvant chemotherapy, within 4 months after the operation, the development of skin reactions, such as redness in the area reconstructed with the endoprosthesis and ADM breast, required hormonal and anti-inflammatory topical treatment, a common antihistamine therapy with a positive result. In 2 (18%) cases, ADM and implant were removed in connection with suppuration of postoperative wound.

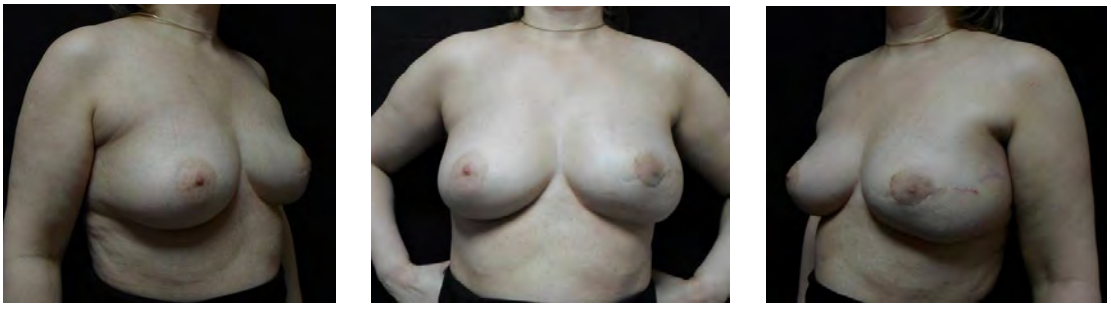
Cosmetic result was rated as excellent in 67.3% cases, good in 19.2%, satisfactory in 7.7%, as unsatisfactoryin 5.8%. The frequency of implant loss was 5.8% when titanium breast mesh was used and 0% with polyester mesh. Seroma was diagnosed in 1.9% when using pork ADM and 2.9% when using titanium mesh. Necrosis of a nipple was in 1.9% when using titanium mesh. Infection of the implant was recorded in 2.9% cases. A capsular contracture developed in 5.8% cases after radiotherapy.

Views of a patients before and after surgery with ADM is given in Fig. 7, 8.



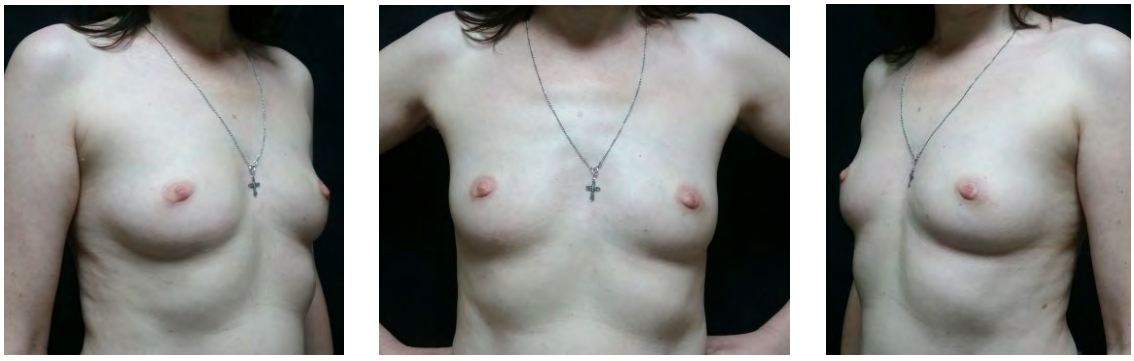
a *b* *c*

Fig. 7. The view of a patient in the three projections prior to surgery. Clinical diagnosis: left side breast cancer ypT2N0M0G2L0V0PR. stage IIA, Her2/neu-positive subtype, the state after a 8 courses of neoadjuvant drug therapy



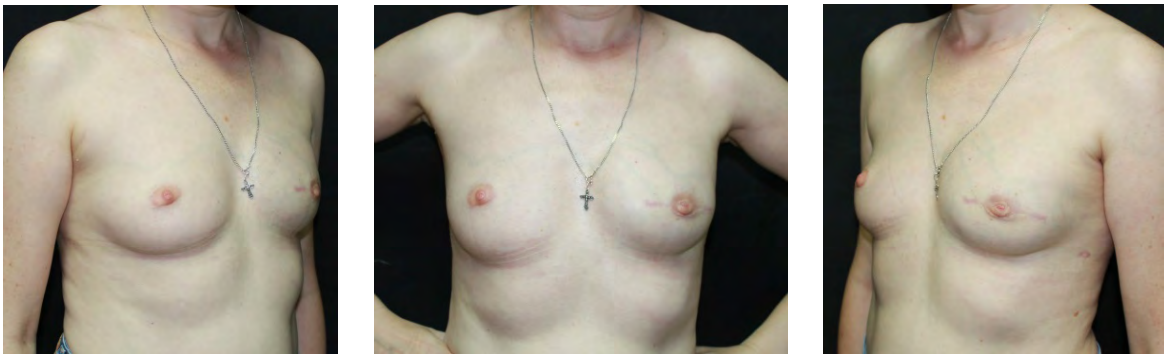
a *b* *c*

Fig. 8. View of the patient in the three projections a month after radical subcutaneous mastectomy on the left breast with one-stage reconstruction with silicone implant and ADM



a *b* *c*

Fig. 9. The view of a patient in the three projections prior to surgery. Clinical diagnosis: left side breast cancer ypT1N0M0G2L0V0,stage I, luminal type, Her2/neu-negative subtype



a *b* *c*

Fig. 10. View of the patient in the three projections a 6 month after radical subcutaneous mastectomy on the left breast with immediate reconstruction of the silicone implant and mesh implant

View of the patient before and after surgery with mesh implant is given in Fig. 9, 10.

CONCLUSIONS

Biological and synthetic materials are significantly important options for breast reconstruction. Their advantages are as follows: they reduce surgical trauma during one-step reconstruction by making the use of autologous muscle grafts unnecessary, they reduce operation time and pain, they make it possible to expand the prosthesis pocket.

The value of pinch-test is the selection criterion to strengthen the lower slope of breast during skin-sparing subcutaneous mastectomy in cancer treatment with one-step reconstruction with silicone implant. When the value of the pinch-test is over 0,5 cm a synthetic implant can be used as well as ADM. When the value of the pinch-test is lower than 0,5 cm the preference should be given to ADM.

According to certain articles, there is increased risk of infection in the reconstruction area whenusing ADM, surgeons should be aware of and take timely preventive measures.

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Поступила в редакцию 09.03.2017
Утверждена к печати 15.05.2017

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