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Teaching material for nursing students: Nursing care of mastectomy patients undergoing plastic surgery

– Project to Turku University of Applied Sciences

TURUN AMMATTIKORKEAKOULU
TURKU UNIVERSITY OF APPLIED SCIENCES

BACHELOR'S THESIS | ABSTRACT

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TEACHING MATERIAL FOR NURSING STUDENTS: NURSING CARE OF MASTECTOMY PATIENTS UNDERGOING PLASTIC SURGERY

Abstract: The purpose of this thesis was to make a project for Turku University of Applied Sciences, comparing alternative options for breast reconstruction patients after mastectomy and nursing care. We found out that the most used methods in Finland are Autologous flaps and tissue expander and implant reconstruction. Autologous flaps include Tram-flap, Diep-flap and LD-flap. Tissue expander is a temporary solution before the final reconstruction. For the nursing care part we focused on the preoperative and postoperative nursing care. Educate preoperative care for the patients before and after surgery postoperative monitoring care.

This project started by searching the databases Cinahl, Pubmed, Cocrain and Google with 10 useful articles. This thesis project was made for nursing students. We made a 29 slides long power point presentation with text, pictures and videos. The presentation was planned to be an hour long. Outcome of the presentation came out well. We got good discussion after the presentation with the nursing group students. The material is now for Turku University of Applied Sciences.

KEYWORDS:

Breast reconstruction, mastectomy, TRAM, DIEP, LD, tissue expander, breast cancer, immediate breast reconstruction, post mastectomy breast reconstruction, nursing care for breast reconstruction.

OPINNÄYTETYÖ (AMK) | TIIVISTELMÄ

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OPETUSMATERIAALI SAIRAANHOITAJA OPISKELIJOILLE: MASTEKTOMIA POTILAAN HOITOTYÖ RINNAN UUDELLEEN RAKENNUS VAIHEESSA.

Tiivistelmä: Opinnäytetyön tarkoituksena oli tehdä hanke Turun Ammattikorkeakoululle, opinnäytetyön tarkoituksena on verrata eri vaihtoehtoisia rintarekonstruktioita potilaille koko rinnanpoiston jälkeen sekä siihen liittyvää hoitotyötä. Huomasimme, että eniten käytettyjä menetelmiä Suomessa ovat mikrovaskulaariset läpät ja kudosten laajentaminen (expanderi) ja implantti. Mikrovaskulaariset läpät ovat Tram-läppä, Diep-läppä ja LD-läppä. Tissue Expander on väliaikainen ratkaisu ennen lopullista uudelleenrakentamista tai implanttia. Hoitotyössä olemme keskittyneet preoperatiiviseen hoitotyöhön ja postoperatiiviseen hoitotyöhön. Potilaan preoperatiivinen hoito ennen leikkausta ja leikkauksen jälkeinen postoperatiivinen seuranta.

Tämä projekti aloitettiin etsimällä tietoja tietokannoista Cinahl, PubMed, Cocrain ja Googlesta, löysimme 10 hyödyllistä artikkelia. Opinnäytetyöprojekti tehtiin hoitotyön opiskelijoille. Teimme 29 sivua pitkän PowerPoint esitys, joka sisälsi tekstiä, kuvia ja videoita. Esitys oli suunniteltu olevan tunnin mittainen. Esityksen tulos oli hyvä. Saimme hyvän keskustelun aikaan esityksen jälkeen hoitotyön opiskelijoiden kanssa. Materiaali on nyt Turun Ammattikorkeakoululle käytettävissä.

ASIASANAT:

Rintarekonstruktio, mastektomia, TRAM, DIEP, LD, kudoksen laajennus, rintasyöpä, välitön rintarekonstruktio, postoperatiivinen rintarekonstruktio, hoitotyö.

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LIST OF ABBREVIATIONS (OR) SYMBOLS

Abbreviation	Explanation of abbreviation (Source)
DCIS	Ductal Carcinoma In Situ
TE	Tissue expander
I	Implant
ASA	American Society of Anesthesiologists
BMI	Body mass index
OR	Operation room
TRAM	Transverse rectus abdominis
DIEP	Deep inferior epigastric perforator artery
LD	Latissimus dorsi muscle
TYKS	Turku University Hospital

1 INTRODUCTION

Breast cancer is the most common cancer among women in Finland since 1960's. The incidence is very low among women under 30 years of age but increases after 45 years of age. Breast cancer is also the most common cancer in women worldwide, with nearly 1.7 million new cases diagnosed in 2012 (second most common cancer overall). This represents about 12% of all new cancer cases and 25% of all cancers in women.

Breast cancer is hormone related, and the factors that modify the risk of this cancer when diagnosed premenopausally and when diagnosed (much more commonly) postmenopausally are not the same.

In Finland the most common reconstruction is performed with a stretcher and an implant. After mastectomy a balloon (stretcher) is inserted under the skin and chest muscles. It has a special valve which can be filled from outside. The implant is being filled gradually with a special solution, until the skin has sufficiently stretched for inserting the implant. It takes another 3-6 months until the breast has acquired its final shape, then the nipple can be reconstructed. Sometimes during mastectomy the skin can be preserved. That would eliminate the need for a stretcher, and a permanent implant (=Becker) can be inserted right away.

The procedure is designed for women who underwent breast amputation after breast cancer or other conditions. Newer techniques allow the surgeon to create a breast which is very similar to the natural one. The reconstruction can be done during the amputation procedure, or a few months or even a year afterwards.

The breast can also be reconstructed with body tissue from areas with extra skin and fat, like the tummy, buttocks and back. The tissue being removed is called "a flap". Common sites to acquire the flap are the lower tummy and the latissimus dorsi muscle from the back.

We want to focus on the different options for breast reconstruction after mastectomy and nursing care for women: preparing the patient for the surgery and postoperative care.

2 PURPOSE AND AIM OF THE PROJECT

The purpose of this project is to look at different options of breast reconstruction and nursing care for patients undergoing surgery.

The aim of this project is to produce English teaching material for Turku University of Applies Sciences. The teaching material is for nursing students from Turku University of Applied Sciences. The thesis is a nursing point of view in the care of patients undergoing breast reconstruction after having breast cancer/mastetomy.

3 EMPIRICAL IMPLICATIONS

The Purpose of this project was to make educational material for nursing students. In this project we used databases: Pubmed, Cocrain, Cinahl and Google. Search was limited in English and with full free texts. Latest year used was 2002. References were selected by contents that were relevant to our thesis. We used search words breast cancer, mastectomy, breast reconstruction, nursing care, TRAM,DIEP,LD, tissue expander, immediate breast reconstruction, post mastectomy breast reconstruction, nursing care AND breast reconstruction, pre-operative and post-operative nursing care. Permission for this project was granted by TURKUAMK (appendix 1).

We made a Power point presentation as a teaching material to Turku University of Applied Sciences (appendix). We presented our teaching material for second year nursing students on November 7th for their surgical and perioperative nursing course. The presentation was planned to be one hour lecture, but it took us an one hour and 15 minutes with questions from the group. The project presentation is 29 pages long and we used photos and videos to illustrate the nursing point of view. Power point presentation of the teaching material is attached to this thesis.

4 IMMEDIATE BREAST RECONSTRUCTION VS POST MASTECTOMY BREAST RECONSTRUCTION

Some women decide to have the breast reconstructed, during the same operation that removes the breast. This is called “immediate reconstruction.” Other women may wait months or years to have a breast reconstructed.

There are many ways to reconstruct a breast. Different techniques include inserting an implant, inserting tissue from another part of the body, or using a combination.

One advantage of immediate reconstruction is that patient don’t have to wake up from surgery and experience the emotional impact of having an empty space where the breast used to be. For some women, however, making decisions about immediate reconstruction is too overwhelming with all the other decisions they have to make.

Regardless of whether you are thinking about having immediate or later breast reconstruction, it’s important to plan reconstruction at a time that works well for you. For instance, healing from reconstruction surgery can sometimes cause delays for women who need prompt chemotherapy. Many surgeons also believe that radiation to a reconstructed breast can compromise the appearance and feeling of the reconstruction. Therefore, in most cases, breast reconstruction should wait until both chemotherapy and radiation are completed.

4.1 Mastectomy

Mastectomy is surgery can be partial or complete removal of the breast due to cancerous or precancerous cell growth. There are five different types of mastectomy: simple or total mastectomy, modified radical mastectomy, radical mastectomy, partial mastectomy, and subcutaneous (nipple-sparing) mastectomy.

4.2 Postoperative complications

Postoperative complications in patients undergoing either immediate or delayed breast reconstruction after mastectomy for malignancy were researched. All patients undergoing reconstruction were then stratified into the tissue expander/implant or flap-based reconstruction group. The frequency of postoperative complications was assessed. A multiplicative risk model was used to calculate the probability of postoperative complications after undergoing a mastectomy alone, followed by reconstruction on a different date. These values were compared with the frequency of postoperative complications in the “mastectomy with immediate reconstruction” cohort (Sanati-Mehrizy P et al 2015).

Comparing patients undergoing delayed TE placement, patients undergoing isolated mastectomies were older, had higher body mass indexes (BMIs), had higher ASA scores, and had an increased history of diabetes, hypertension, and dyspnea on exertion. Patients undergoing delayed TE placement were marginally older and had an increased history of hypertension with similar other medical risk factors when compared with those who had immediate TE placement (Sanati-Mehrizy P et al 2015).

Patients undergoing isolated mastectomies were older, had higher ASA scores, and had an increased history of diabetes, hypertension, and dyspnea on exertion when compared with patients undergoing delayed flap reconstruction. Patients undergoing delayed flap reconstruction, when compared with patients undergoing mastectomy with immediate flap reconstruction, were marginally older with higher ASA scores. When compared with the calculated risk of delayed TE/I reconstruction, immediate reconstruction using TE/I was associated with decreased medical complications ($P < .0001$) and decreased surgical complications ($P < .0001$). The incidence of surgical complications was significantly decreased for the immediate reconstruction group when compared with the delayed flap reconstructive approach (Sanati-Mehrizy P et al 2015).

While the risk of medical complication was higher among all patients undergoing delayed rather than immediate TE reconstruction, this risk was particularly notable in patients with diabetes, those older than 65 years, smokers, those with higher ASA scores, and those with hypertension. The calculated risk of medical

complications in flap-based reconstruction was also overall higher in the delayed reconstructive model, yet the extent of this effect was not statistically significant in any of the patient subsets analyzed.

The risk for surgical complications was higher among both delayed TE and delayed flap-based breast reconstruction, when compared with their immediate reconstructive counterparts. The difference in TE-based reconstructions was more notable for patients with a history of smoking. The difference in flap-based reconstruction was more notable in patients with higher ASA scores, hypertension, and BMI of more than 35. Delayed reconstruction appeared to have a protective effect for flap failure. Patients with diabetes and with a BMI of more than 35 had a more notable protective effect than patients who did not have these comorbidities. This may be due, in part, to the low number of flap failures reported in the NSQIP database over this time period. A similar protective effect was not observed in TE/I failure, but TE/I failure rates were much lower than flap failure rates. In flap-based reconstruction, the incidence of return to the OR was higher with delayed reconstruction than with immediate reconstruction. While the risk for return to the OR was increased with delayed TE reconstruction, this finding was not statistically significant.

Postoperative medical and surgical complications in TE/I and flap reconstructions was decreased in cases with immediate reconstruction when compared with delayed reconstruction. Immediate reconstruction was associated with decreased rates of return to the OR. Patients with preoperative medical risk factors, such as increased age, higher ASA scores, hypertension, diabetes, smoking, and higher BMI tended to benefit more from immediate reconstructions. For flap failure, however, delayed reconstruction was associated with a protective effect, which may be due, in part, to the low number of reported flap failures. TE/I reconstructions overall had fewer medical or surgical complications than with flap reconstructions. The surgeon should take the patient's preoperative medical risk profile into account when determining whether immediate or delayed reconstruction would be more beneficial for the patient. (Sanati-Mehrizy P et al 2015.)

5 AUTOLOGOUS BREAST RECONSTRUCTION

Autologous breast reconstruction has its advantages and disadvantages. Advantages include the fact that it is patient`s own tissue, and the risk of infection is much less than in implant reconstruction, it does not deflate and does not need to be replaced in the future.

The disadvantages and risks of autologous tissue reconstruction are that the procedure is longer. Surgery for a unilateral reconstruction is four to six hours, including the mastectomy. A bilateral reconstruction can take seven to ten hours. Since the tissues used to reconstruct the breast need blood flow to survive, there is always the risk that there could be a problem with this blood flow. If this occurs, it requires a return visit to the operating room to evaluate the flap and attempt to salvage it and to provide a successful breast reconstruction. Reconstruction is a process and is rarely completed in one operation. Typically, four months after the initial operation, revisions are performed to improve the contour of the reconstructed breast. If only one breast was treated, the other breast may need a lift, reduction, or augmentation to improve the balance and appearance between both breasts. In addition, nipple areolar reconstruction may be performed if the nipple was removed at the time of mastectomy.

5.1 TRAM-flap

TRAM stands for transverse rectus abdominis, a muscle in lower abdomen between waist and pubic bone. A flap of this skin, fat, and all or part of the underlying rectus abdominus (6-pack) muscle are used to reconstruct the breast in a TRAM flap procedure. TRAM flaps are the most commonly performed type of flap reconstruction, partly because TRAM flap tissue is very similar to breast tissue and makes a good substitute. They also have been around for some time, and many surgeons know how to do them. The downside of TRAM flaps is that they do cut through muscle, while other types of flap reconstruction avoid this and are therefore “gentler” operations.

There are two main types of TRAM flaps;

Free TRAM flap: In a free TRAM flap, fat, skin, blood vessels, and muscle are cut from the wall of the lower belly and moved up to your chest to rebuild breast. Surgeon carefully reattaches the blood vessels of the flap to blood vessels in chest using microsurgery. There is also what's called a "muscle-sparing" free TRAM flap. This means that surgeon tries to use only part of the rectus abdominis muscle for the flap, instead of a large portion of the muscle. Because only a portion of the muscle is used, women may recover more quickly and have a lower risk of losing abdominal muscle strength than if they had the full width of muscle taken.

Pedicled (or attached) TRAM flap: In a pedicled TRAM flap, fat, skin, blood vessels, and muscle from lower belly wall are moved under the skin up to the chest to rebuild the breast. The blood vessels (the artery and vein) of the flap are left attached to their original blood supply in the abdomen. (The artery and the vein are the "pedicle.") Pedicled TRAM flaps almost always use a large portion of the rectus abdominis muscle and are known as "muscle-transfer" flaps. Recovering from a pedicled TRAM flap can take longer than recovering from a muscle-sparing free TRAM flap because more muscle is used. One risk with pedicled TRAM flaps is that the moved tissue may not get enough blood circulation and some of the tissue might die. The blood supply to the pedicled TRAM flap is often less powerful than it is with free flap procedures such as the free TRAM flap or DIEP**.** With the free flaps, there is also a small risk of the moved tissue not getting enough blood supply, but partial loss of the tissue is much less common. If it does happen, surgeons may call this “partial flap failure.” In general, microsurgeons view free flaps as having better results because they can be more easily shaped and they allow the breast fold to be better preserved, and the risk of not enough blood supply is lower.

Once you take tissue from a donor site on the body, such as the belly, it can’t be used again for breast reconstruction. So if patient is thinking about prophylactic removal and reconstruction of the other breast, they might want to make that decision before they decide on reconstruction. If patient has TRAM flap reconstruction on one breast and then later needs reconstruction on other breast, tissue for

the second, later reconstruction will have to come from buttocks, inner thighs, or back.

Because skin, fat, muscle, and blood vessels are moved from the belly to the chest, having a TRAM flap means belly will be flatter and tighter, as if had a tummy tuck. Still, a TRAM flap does leave a long horizontal scar, from hipbone to hipbone. About one-third of the way between the top of a pubic hair and navel. In most cases, the scar is below the bikini line. After the skin and fat are removed from belly, surgeon may place an artificial mesh material to cover the area where the muscle was removed and then close the abdomen. If mesh is used, it stays there permanently. Navel is then brought back out through a separate incision and reshaped.

While it's the most popular flap reconstruction procedure, a TRAM flap isn't for everyone. It's not a good choice for:

- thin women who don't have enough extra belly tissue
- women who already have had multiple abdominal surgeries
- women who plan on getting pregnant
- women who are concerned about losing strength in their lower abdomen

5.1.2 Risks and complications

TRAM flap surgery has some risks. Many of the risks associated with TRAM flap surgery are the same as the risks for mastectomy. However, there are some risks that are unique to TRAM flap reconstruction;

Tissue breakdown: In rare instances, the tissue moved from the belly to the breast area won't get enough circulation and some of the tissue might die. Some symptoms of tissue necrosis include the skin turning dark blue or black, a cold or cool-to-the-touch feeling in the tissue, and even the eventual development of open wounds. Patient also may run a fever or feel sick if these symptoms are not addressed immediately. If a small area of necrosis is found, surgeon can trim away the dead tissue. This is done in the operating room under general anesthesia or

occasionally in a minor procedure setting. If most or all of the flap tissue develops necrosis, doctor may call this a “complete flap failure,” which means the entire flap would need to be removed and replaced. Sometimes the flap can be replaced within a short timeframe, but in most cases the surgical team will remove all the dead tissue and allow the area to heal before identifying a new donor site to create a new flap.

Lumps in the reconstructed breast: If the blood supply to some of the fat used to rebuild the breast is cut off, the fat may be replaced by firm scar tissue that will feel like a lump. This is called fat necrosis. These fat necrosis lumps may or may not go away on their own. If they don't, it's best to have surgeon remove them. After having mastectomy and reconstruction, it can be a little scary to find another lump in the rebuilt breast. Having them removed can give the patient greater peace of mind, as well as ease any discomfort they might have.

Hernia or muscle weakness at the donor site: A hernia happens when part of an internal organ (often a small piece of the intestine) bulges through a weak spot in a muscle. Most hernias happen in the abdomen. They usually happen when someone who has a weak spot in an abdominal muscle strains the muscle, perhaps by lifting something heavy.

Hernias can be painful and can cause a noticeable bulge in abdomen. Hernias usually are treated by surgically inserting mesh to support the muscle wall. The surgery is generally done on an outpatient basis. Hernias can often come back. If patient has a free TRAM flap or a pedicled TRAM flap, the risk of hernia is higher than if patient has a muscle-sparing free TRAM flap. This is because more muscle has been moved to rebuild the breast and the abdominal muscles may be weaker. If these risks are a concerned, more preferable procedure is: the DIEP flap, which is developed to minimize these issues and is less likely to put patient at risk for hernia, since it preserves all of the abdominal muscle (Steligo 2012.) (Picture 1.)

5.2 DIEP flap

A DIEP flap is similar to a muscle-sparing free TRAM flap, except that no muscle is used to rebuild the breast. A muscle-sparing free TRAM flap uses a small amount of muscle. A DIEP flap is considered a muscle-sparing type of flap. DIEP stands for the deep inferior epigastric perforator artery, which runs through the abdomen.

In a DIEP flap, fat, skin, and blood vessels are cut from the wall of the lower belly and moved up to the chest to rebuild the breast. Surgeon carefully reattaches the blood vessels of the flap to blood vessels in the chest using microsurgery. Because no muscle is used, most women recover more quickly and have a lower risk of losing abdominal muscle strength with a DIEP flap compared to any of the TRAM flap procedures. Because the DIEP flap procedure requires special surgical training as well as expertise in microsurgery, not all surgeons can offer DIEP.

Because skin, fat, and blood vessels are moved from the belly to the chest, having a DIEP flap means patients belly will be flatter and tighter. Still, a DIEP flap does leave a long horizontal scar, from hipbone to hipbone about one-third of the way between the top of the pubic hair and the navel. In most cases, the scar is below the bikini line. After the skin and fat are removed from the belly, the abdomen is closed. No mesh material is required to support the abdominal wall, as may be the case with a TRAM flap. Navel is then brought back out through a separate incision and reshaped.(picture1)

While DIEP flap breast reconstruction is popular because it doesn't move or cut muscle, which usually means a shorter recovery time than a TRAM flap, a DIEP flap isn't for everyone. It's not a good choice for:

- Thin women who don't have enough extra belly tissue
- Women who already have had certain abdominal surgeries, including colostomy or abdominoplasty, tummy tuck. This does not include midline incisions extending from the belly button to the pubic region or other routine abdominal operations.

- Women whose abdominal blood vessels are small or not in the best location to do a DIEP flap.

5.2.1 Risks and complications

Like all surgery, DIEP flap surgery has some risks. Many of the risks associated with DIEP flap surgery are the same as the risks for mastectomy. However, there are some risks that are unique to DIEP flap reconstruction;

Tissue breakdown: In rare instances, the tissue moved from the belly to the breast area won't get enough circulation and some of the tissue might die. Some symptoms of tissue necrosis include the skin turning dark blue or black, a cold or cool-to-the-touch feeling in the tissue, and even the eventual development of open wounds. Patient also may run a fever or feel sick if these symptoms are not addressed immediately. If a small area of necrosis is found, surgeon can trim away the dead tissue. This is done in the operating room under general anesthesia or occasionally in a minor procedure setting. If most or all of the flap tissue develops necrosis, doctor may call this a “complete flap failure,” which means the entire flap would need to be removed and replaced. Sometimes the flap can be replaced within a short timeframe, but in most cases the surgical team will remove all the dead tissue and allow the area to heal before identifying a new donor site to create a new flap.

Lumps in the reconstructed breast: If the blood supply to some of the fat used to rebuild the breast is cut off, the fat may be replaced by firm scar tissue that will feel like a lump. This is called fat necrosis. These fat necrosis lumps may or may not go away on their own. If they don't, it's best to have surgeon remove them. After having mastectomy and reconstruction, it can be a little scary to find another lump in the rebuilt breast. Having them removed can give the patient greater peace of mind, as well as ease any discomfort they might have.

Hernia or muscle weakness at the donor site: a hernia happens when part of an internal organ, often a small piece of the intestine bulges through a weak spot in a muscle. Most hernias happen in the abdomen. They usually happen when

someone who has a weak spot in an abdominal muscle strains the muscle, perhaps by lifting something heavy. Hernias can be painful and can cause a noticeable bulge in abdomen. Hernias usually are treated by surgically inserting mesh to support the muscle wall. The surgery is generally done on an outpatient basis. Hernias can often come back. If patient has a DIEP flap, she has a small risk of hernia. Risk of hernia is much lower with a DIEP flap than with any type of TRAM flap. This is because a DIEP flap uses no muscle to rebuild the breast. Still, after any abdominal surgery, there is some risk of hernia (Steligo2012.)

5.3 LD- flap

Latissimus dorsi muscle is located in back, just below shoulder and behind armpit. It's the muscle that helps do twisting movements, such as swinging a racquet or golf club. In a latissimus dorsi flap procedure, an oval flap of skin, fat, muscle, and blood vessels from patients upper back is used to reconstruct the breast. This flap is moved under the skin around to chest to rebuild the breast. The blood vessels (artery and vein) of the flap are left attached to their original blood supply in the back. Because the flap contains a significant amount of muscle, a latissimus dorsi flap is considered a muscle-transfer type of flap.

While the skin on the back usually has a slightly different color and texture than breast skin, latissimus dorsi flap breast reconstruction can look very natural. Because the donor site for the latissimus dorsi flap is closer to the chest than the donor sites for abdominal tissue flaps, and because the blood vessels in the back are usually strong, the latissimus dorsi flap may be a good reconstruction choice for women who are not good candidates for TRAM or DIEP flaps for a number of different reasons, such as:

- There’s not enough donor tissue.
- They’ve had previous flaps that failed and need a secondary alternative.
- They don’t have access to plastic surgeons who can perform the microsurgery that free flaps require.

The latissimus dorsi flap may be a good option for women with small- to medium/small-sized breasts because there's usually not much fat on this part of the back. In most cases, a breast implant has to be placed under the flap to achieve the desired shape, size, and projection. A latissimus dorsi flap procedure leaves a scar on back, but most surgeons try to place the incision so the scar is covered by bra strap. (picture2)

While the latissimus dorsi flap may offer good results with few complications, it does have some drawbacks:

• Patient may have partial loss of strength or function that makes it hard to lift things and twist. This can affect ability to perform certain swimming, golf, or tennis strokes, or turn and manipulate objects. So it’s generally not a good choice for bilateral reconstruction, because the patient could then have muscle issues on both sides.

• The fat around the latissimus muscle is stiffer than fat that comes from the belly area, so some women say that their latissimus dorsi reconstructed breast feels "tighter" than their other breast.

5.3.1Risks and complications

Latissimus dorsi flap surgery has some risks. Many of the risks associated with latissimus dorsi flap surgery are the same as the risks for mastectomy. If patient has an implant inserted along with latissimus dorsi reconstruction, there are also risks unique to implant reconstruction. However, there are some risks that are unique to latissimus dorsi flap reconstruction:

Tissue breakdown: In rare instances, the tissue moved from back to breast area won't get enough circulation and some of the tissue might die. Some symptoms of tissue necrosis include the skin turning dark blue or black, a cold or cool-to-the-touch feeling in the tissue, and even the eventual development of open wounds. Patient also may run a fever or feel sick if these symptoms are not addressed immediately. If a small area of necrosis is found, surgeon can trim away

the dead tissue. This is done in the operating room under general anesthesia or occasionally in a minor procedure setting. If most or all of the flap tissue develops necrosis, a complete flap failure, which means the entire flap would need to be removed and replaced. Sometimes the flap can be replaced within a short timeframe, but in most cases the surgical team will remove all the dead tissue and allow the area to heal before identifying a new donor site to create a new flap.

Lumps in the reconstructed breast: If the blood supply to some of the fat used to rebuild the breast is cut off, the fat may be replaced by firm scar tissue that will feel like a lump, fat necrosis. These fat necrosis lumps may or may not go away on their own. They also might cause some discomfort. If the fat necrosis lumps don't go away on their own, it's best to have surgeon remove them. After having mastectomy and reconstruction, it can be a little scary to find another lump in rebuilt breast. Having them removed can give a greater peace of mind, as well as ease any discomfort patient might have.

Muscle weakness: In some cases, patient may have some weakness in back, shoulder, or arm after latissimus dorsi flap breast reconstruction because some of back muscle has been moved to chest. They may have partial loss of strength or function that makes it hard to lift things and twist. This can affect an ability to perform certain swimming, golf, or tennis stokes, or turn and manipulate objects (Steligo2012.)

6 TISSUE EXPANDER

Breast reconstruction with tissue expanders and implants offers patients satisfying aesthetic results with no donor site morbidity. Preoperative planning is discussed, emphasizing close collaboration with medical and surgical oncology colleagues. Special concerns regarding adjuvant radiation are also addressed. Intraoperative techniques that optimize the final result are presented, along with a reliable and reasoned approach to the management of complications. With these guidelines, aesthetically pleasing results with few complications can be obtained consistently. Implant breast reconstruction has evolved over the past two decades into a highly successful and satisfying method of reconstruction. Conceptually simple, it is now a precise and demanding art that requires the integration of many variables. These include preoperative consideration of patient expectations, communication with oncology colleagues regarding possible adjuvant therapy, and decision making about expander/implant selection. Operatively, close collaboration with the surgical oncologist is essential as is a clear appreciation of the technical aspects of device placement. Careful postoperative management is crucial to appropriately manage complications and minimize the incidence of explantation. (Pusic L et al. 2004.)

6.1 First stage

Implant breast reconstruction is generally best performed as a two-stage procedure. Although satisfactory results can be obtained with single-stage surgery, for most patients a more reliable approach involves removal of the expander and placement of the permanent device as a second operation. The second stage allows for one precise positioning of the inframammary fold; second capsulotomy to release soft tissue and third re-evaluation of breast height and width to achieve maximal symmetry with the contralateral breast. Selection of the optimal tissue expander requires careful assessment of the breast dimensions. In general, an expander should be selected that accurately matches breast width. The height of the device may exceed that of the contralateral breast to permit full expansion of the breast skin flaps. The potential volume of the expander should equal or

slightly exceed the estimated breast volume. In the setting of a delayed reconstruction, a review of the previous mastectomy weight/volume may be helpful as an estimate of the contralateral breast volume.

Right positioning of the expander is critical to the success of the reconstruction. In delayed reconstructions, the lateral one third of the mastectomy incision is reopening to provide access to the subpectoral plane. In immediate reconstruction, the lateral border of the pectoralis is easily elevated. The submuscular dissection is then continued medially to ∼1 cm from the midline. Inferiorly, the dissection proceeds to the junction of the pectoralis fascia with the rectus fascia. As the dissection extends below the inframammary fold, it remains deep to the overlying fascia. Once below the level of the breast resection, the dissection changes to a more superficial plane. This facilitates release of the superficial fascia, which would otherwise hinder the expansion process.

The expander should ideally be placed 1 to 2 cm below the inframammary fold to allow for maximal expansion in the lower pole of the breast. In bilateral reconstructions, great care should be taken to obtain symmetric expander placement. If at all possible, total musculofascial coverage of the device should be achieved. In the event of skin flap necrosis, total muscle coverage will decrease the risk of device exposure. Laterally, a flap of serratus fascia and muscle is raised to the anterior axillary line. It is not necessary to raise the entire thickness of the serratus muscle. The serratus flap is then sutured to the lateral border of the pectoralis major muscle. Drains are then placed and a secure, layered skin closure performed. The mastectomy flaps should be tailored to minimize medial and lateral skin excess and to maximize future breast contour. (Pusic L et al. 2004.)

6.2 Second stage

Removal of the expander and placement of the permanent implant may be performed approximately 1 month after completion of the expansion. If the patient has undergone chemotherapy or radiation, the second-stage surgery should be scheduled no sooner than 1 month after completion of adjuvant treatment to minimize the risk of local wound complications. Prior to surgery, the patient should

be well informed regarding implant risks and have the opportunity to select either a silicone- or saline-filled implant. In general, silicone implants may give a more natural and pleasing texture to the breast. By using a saline implant in unilateral reconstructions, presents more options with regard to shape and volume of the implant. This is particularly helpful for difficult or larger-volume reconstructions.

At the time of surgery, a full circumferential capsulotomy is performed. It is important that the release extend into the subcutaneous tissues to fully release the skin envelope. In combination with the implant, the skin envelope predominately determines the shape of the reconstructed breast. Additional capsulotomies may be needed to achieve full breast projection.

The shape, volume, and projection of the final implant needs to be carefully considered both preoperatively and intraoperatively. In unilateral reconstructions, implant selection is guided by the dimensions of the contralateral breast and in bilateral reconstruction, by the proportions of the chest wall. Breast height and width tends to fall into one of several categories. Example, tall, slender patients may have increased breast height with a narrow width. Conversely, older, overweight patients are more likely to have a short, wide breast. A round implant may be occasionally used, selection of contoured implants helps to incorporate these dimensions. Depending on the type of expander used, implant volume will generally be ~80% of the final expander volume. If possible, it is also helpful to consider the original mastectomy weight. Full-projection implants are most commonly used to try to match the projection of a contralateral breast. The use of implant sizers is essential to intraoperative implant selection and determination of volume. These methods apply for both saline and silicone implants. It is also critical that the patient be brought into the full upright sitting position. The upright position may be considered the “anatomic position” for the breast and should be the point of reference for decisions regarding shape, volume, projection, and position. (Pusic L et al. 2004.)

6.3 Methods

Tissue expansion has become the most important method for post mastectomy breast reconstruction. Well-defined inframammary fold and ptosis are difficult to achieve with this technique. A study was performed to evaluate the inframammary fold and ptosis achieved in breast reconstruction using a textured tissue expander, later replaced by a textured implant. In ten postmastectomy patients, a textured tissue expander was inserted into a submuscular pocket. Every two to three weeks the volume of the expander was increased by about 30%. About three months after the last filling, the expander was removed and replaced with a permanent textured, gel-filled implant. The profile of the reconstructed breast was recorded before and after the tissue expansion, as well as before and after the change of the implant. The results showed that the inframammary fold did not move significantly upwards or downwards during the expansion period when a textured tissue expander was used. Waiting three months after the last inflation of the expander before replacing it with the permanent implant resulted in a more ptotic breast mound.

No real ptosis was achieved, meaning that the angle between the lower part of the breast and the lower chest wall was more than 90 degrees. These findings indicate that a textured expander could help create a pronounced inframammary fold, but without ptosis. A three-month waiting period before inserting the permanent implant may improve the development of an inframammary fold. (Fan J et al. 2002.)

6.4 Risks and complications

After mastectomy, 246 patients underwent smooth, round tissue expander implantation. The expander size was chosen based on body weight, body height, breast contour, width of chest wall and resected breast mass. A variable volume of normal saline (20–100 mL) was injected into the tissue expander as the preexpansion volume; the exact amount of which was determined by skin tension. The pectoralis major muscle and the serratus anterior muscle were dissected and elevated to fully cover the tissue expander. Patients were treated with acellular dermal matrix for lower pole reconstruction. Some patients in this study underwent additional rectus abdominis muscle dissection to supply adequate muscle

tissue for better tissue expander coverage and a better defined inframammary fold.

Complications occurred only when the tissue expander stage was evaluated, including skin necrosis, capsular contracture, wound dehiscence, infection, implant rupture, and hematoma. Those complications may result in unexpected removal of tissue expander. Infection was defined as inflammatory changes that resulted in treatment with antibiotics and/or surgical intervention. Capsular contracture was defined as Baker Scale Grade III and Grade IV, which would result in early expander loss. Most patients experienced some degree of capsular contracture in the late stage. Severe capsular contracture, however, might share the same risk factors as infection and hematoma. Patients experiencing any of the above complications were included in the complication group. (Chang CW et al. 2016.) (Table 2.)

Complication	***Tissue expander; n = 246***
Skin necrosis	*12 (4.9)*
Wound dehiscence	*10 (4.1)*
Capsular contracture	*9 (3.6)*
Infection	*6 (2.4)*
Hematoma	*3 (1.2)*
Implant rupture	*5 (2.0)*
Removal of tissue expander	*13 (5.8)*
Re-implant	*6*

Data are presented as n (%).

6.5 Tissue expander in practice

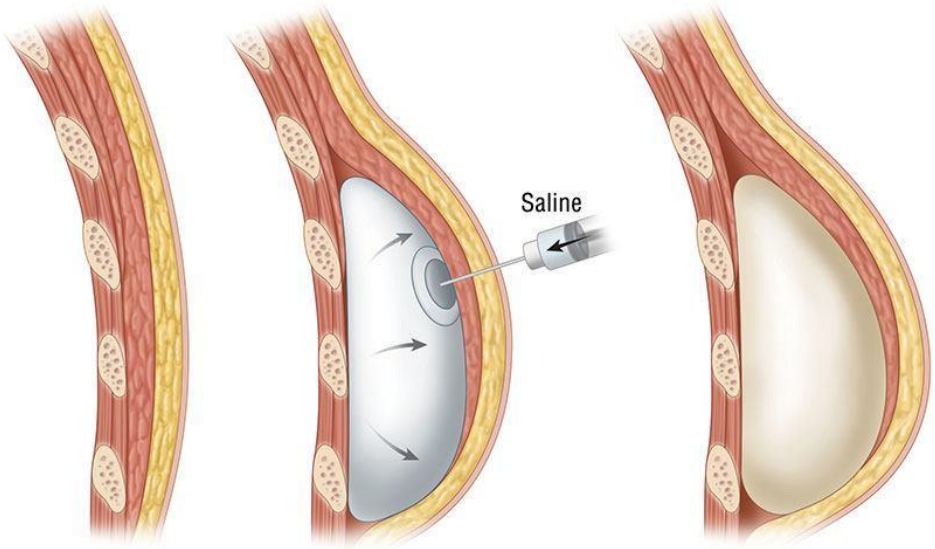
A common breast reconstruction technique is tissue expansion, which involves expansion of the breast skin and muscle using a temporary tissue expander. A

few months later, the expander is removed and the patient receives either microvascular flap reconstruction, or the insertion of a permanent breast implant. This type of breast reconstruction requires two separate operations.

During implant reconstruction, if the implant inserted during the mastectomy (immediate reconstruction) and enough tissue is available to cover the implant, plastic surgeon will place the breast implant under the chest muscle after the breast surgeon has removed the breast tissue.

If a large amount of skin is removed during mastectomy or you're having the staged approach to implant reconstruction (delayed-immediate reconstruction), plastic surgeon places a tissue expander between the skin and chest muscle after the surgeon has removed the breast tissue. A tissue expander is an implant that’s more like a balloon. It stretches the skin to make room for the final implant.

The expander has a port where the surgeon can add increasing amounts of saline over time between 2 to 6 months until the skin gradually is stretched enough for the implant reconstruction. (Picture 3.)



7 NURSING CARE

7.1 Preoperative nursing care

A cancer diagnosis of any type is likely to create a variety of emotions for the patient which include: fear, shock, anger, anxiety, denial, and depression. Many women are surprised by the diagnosis because they feel healthy. Patients with breast cancer, unlike those with many other cancers, rarely have unpleasant signs and symptoms at the time of diagnosis. (Weaver C. 2009.)

In cases of invasive breast cancer and noninvasive cancer with aggressive features, the axillary lymph nodes must be evaluated to see if the cancer has spread locally. The sentinel node or nodes are the first lymph nodes into which the tumor drains, so if the cancer has started to spread, cancer cells will be found in these nodes. If no cancer is found in the sentinel node or nodes, further lymph node surgery isn't needed. If cancer is found in sentinel nodes, the surgeon will do a full axillary node to determine how many other nodes are involved. Because sentinel node biopsy spares many women from more aggressive surgery, it's a major advance in the surgical treatment of breast cancer. Shortened hospital stays, lowering the incidence of lymphedema, pain, paresthesia and restriction in upper extremity range of motion. The preferred method is for reconstruction to be done at the time of mastectomy, but some women wait until after adjuvant treatment or even years later. A decision against reconstructive surgery may be based on various factors, such as: patient preference, age, educational level, treatment plan, prognosis, and overall health or comorbidities. Preoperative and postoperative care is more complex for these women and depends on the type of breast reconstruction. (Weaver C. 2009.)

Assessing and being sensitive to the patient's emotional health is essential to nursing care and effective teaching. Assess the patients learning needs and readiness to learn before you begin teaching. Keep in mind that patients may have different information-seeking behaviors. Some won't ask questions and want the healthcare providers to tell them what they need to know. Others want to know

many details, such as recurrence and survival rates. They may ask questions, which may cause needless anxiety about a situation that may never occur. Explain to the patient that they will be evaluated by their doctor a few weeks before the surgery. Tests include; blood tests, urinalysis, and an ECG. The patient should be asked about medications and supplements she's taking, and if she's allergic to any medications, or if she has any other allergies. Her doctor may direct her to discontinue some medications. (Weaver C. 2009.)

The night before surgery, the patient should follow her healthcare provider's instructions on when to stop eating and drinking. Tell the patient that surgery usually lasts 2 to 4 hours, depending on the type of mastectomy and breast reconstruction. Flap reconstruction surgery can last for much longer time. The patient should stay in the hospital overnight after mastectomy. If she has breast reconstruction at the same time as the mastectomy, hospital stay will be 2 to 4 nights, depending on the type of reconstruction. Tell the patient and her support person about postoperative care in the hospital and at home. This information will need to be reinforced postoperatively before discharge. Provide printed instructions for the patient to refer to later. Teaching topics include expected length of stay, routine postoperative monitoring, caring for a drainage tube, reducing the risk of lymphedema, range of motion exercises, pain management, and support groups. If the patient is having difficulty with decision making or expresses interest in seeing photographs of women who have had mastectomies, with or without reconstruction, it may be appropriate to show the patient these photographs. (Weaver C. 2009.)

The patient will be asked to stop taking aspirin as well as any blood thinners like marevan, medications containing vitamin E and any non-steroidal anti-inflammatory medications containing ibuprofen. Patient may be instructed to take laxatives. Because narcotic pain medication tends to cause constipation, and taking a laxative twice a day for a few days prior to surgery may prove to be beneficial. If the patient is a smoker, the plastic surgeon should have already talked about the risks associated with smoking and reconstruction. Some plastic surgeons will not operate on a smoker, because it will negatively affect the healing process

after surgery which can lead to bad after results. And smoking produces nicotine and carbon monoxide which will cause the blood vessels in your skin to constrict, resulting in poor wound healing. In the setting of a tissue expander, skin on the breast will be compromised and could result in loss of the tissue expander. TRAM flaps in particular are more likely to have complications such as fat necrosis. Smoking increases also the risks when patient is under anesthesia. The patient should be educated to quit smoking as soon as possible after the diagnosis, to allow as much time as possible for body to recover from the effects of smoking prior to surgery. The most important thing you can do to ensure a smooth transition from the hospital to the comfort of your home is to prepare as much as you can in advance. Another way to prepare for surgery is by garment shopping ahead of time. Most patients, especially those undergoing bilateral surgery, will not be able to pull a shirt over their heads. For this reason the patient should be educated to have soft and comfortable clothes. You should also set up your bed and bedside table in advance, so that when you arrive home from the hospital, all you have to do is climb in and relax. The patient may need a lot of pillows on your bed, including extra pillows for behind your back and under your legs. (Feingold 2007.)

7.2 Postoperative nursing care

Postoperative care for a patient who's undergone autologous breast reconstruction includes the usual postoperative monitoring and strict patient care attention to patient`s unique needs. Patient has two surgical sites and possibly tunneled tissue and blood vessels that have been reattached by microsurgery. The anatomy, the type of mastectomy, the amount of tissue spared, damage from radiation, and lymph node dissection all play a role in reconstruction and aesthetic outcome. After the surgery patient goes to PACU/ICU to close monitoring, tissue perfusion to the newly created breast. Any decrease in blood flow could lead to a partial or complete loss of the tissue flap.

In a ward notify the surgeon immediately of signs of decreased perfusion. A compressed blood vessel or clot formation at the site of anastomosis may be the cause. Monitoring requirements differ between pedicle and free flaps and according to surgeon preference, but generally nurses should assess perfusion to the flap at these intervals:

- pedicle flap, every 4 hours
- free flap, every hour for the first 48 hours
- with any change in flap appearance.

Maintain fluid balance and hydration, which are important for adequate tissue perfusion. Administer intravenous fluids as ordered until the patient can drink adequately. Advance patient`s oral intake slowly to prevent nausea and vomiting; severe vomiting could trigger wound dehiscence.

Assess surgical incisions, including wound edge approximation, and the amount and characteristics of drainage from the incisions and drains. Check for induration, tenderness, and erythema. The surgical drains may remain in place up to 2 weeks, until the drainage measures less than 30 ml in 24 hours. Report signs of infection such as temperature above 38° C or increased warmth, tenderness, or purulent drainage at the incision sites. Apply a soft surgical dressing and a breast or abdominal binder or surgical bra for support. Make sure these binders provide support without impairing circulation.

Assess and manage the patient's pain to aid recovery and prevent pulmonary complications. Both abdominal and back pain can interfere with adequate lung expansion. Complications of autologous breast reconstruction are rare, they can have serious consequences if not identified and addressed early. Monitor for these problems and educate patient about the signs and symptoms:

Vessel thrombosis can occur if the vessels are compressed or a clot forms at the site of anastomosis. The patient must return to surgery to have the clot removed and restore blood flow to the tissue flap.

Bleeding or hematoma or seroma formation can occur at the recipient site or donor site when drainage is inadequate. A seroma usually occurs after the drains are removed. Fluid collecting under the skin can become increasingly uncomfortable and may require aspiration.

Fat necrosis occurs when the skin has adequate perfusion but the fat doesn't. The patient may notice a firmer area on the tissue flap weeks or months after the surgery. In time, the tissue will soften to a degree.

Other complications include bulges or hernias at the donor site because of muscle removal or a separation or tear in the abdominal fascia. Hernias require surgical repair if they become incarcerated or strangled.

Discussing self-care after discharge and your patient's expectations for recovery will help decrease anxiety and fears about the diagnosis and surgery results. Individualize your instructions for the type of surgery patients had, any complications, and patient`s emotional needs.

Most women who've had autologous breast reconstruction go home with one or more incisional dressings and drains. Teach your patient the signs and symptoms of infection at the incision sites and show her how to change dressings. Explain that the drains will be in place for 1 to 2 weeks, depending on the amount of drainage. Have her demonstrate tube stripping, emptying the drainage, and recording the color and amount.

Indicate whether she should shower or sponge bathe and show her how to get a proper fit while wearing a surgical bra. If she wears an abdominal binder for support, show her how to apply it and have her give a return demonstration.

Recommend that she wear loose clothing and front-button tops for comfort and convenience. She may use a pillow to support her arm and shoulder while resting or sleeping.

Advise your patient to increase her physical activity as tolerated, but for 3 weeks she shouldn't lift anything heavier than 1- 2 kg or reach above her head. The surgeon will recommend stretching exercises, which she can begin in the hospital

and continue after discharge. Tell her to stretch slowly to the point of discomfort, but not to pain, and have her do the exercises as you observe. Encourage her to hold each position as long as she can. She may begin physical therapy after a few weeks to assist with postural and abdominal strengthening and to stabilize her pelvis.

Massaging the breast tissue and scar after her incision heals will help break down scar tissue, alleviate throbbing and hypersensitivity, and help her tolerate numbness. Suggest massaging the scar tissue in a circular motion using vitamin E oil or aloe vera. Advise her that the size, shape, color, and sensation of the reconstructed breast will differ from that of the other breast.

Patient should anticipate additional surgery to improve the final outcome and aesthetics. Subsequent surgeries include nipple reconstruction, revision of flap bulges or hypertrophied scar tissue, or modifications to the other breast for symmetry. Remind your patient to continue for regular examinations and mammography of the opposite breast.

Regardless of whether your patient undergoes breast reconstruction immediately after mastectomy or later, assessing and addressing patient`s emotional needs will help foster a trusting and caring relationship. Ask the patient how she's coping. Opening the conversation this way invites her to talk about her fears, concerns, appearance, and sexuality.

Encourage the patient to seek counseling and attend support groups to avoid feeling alone. By understanding what breast reconstruction entails and individualizing care for your patient, you help her meet the physical and emotional challenges that go with a breast cancer diagnosis and recovery. (Stermer 2008.)

Nipple and areola reconstructions

When treating breast cancer with a mastectomy, the nipple is typically removed along with the rest of the breast. (Some women might be able to have a nipple-sparing mastectomy, where the nipple is left in place.)

If you’re having breast construction after your mastectomy, you can decide if you want to have the nipple and the dark area around the nipple (*areola*) reconstructed.

Nipple and areola reconstructions are usually the final phase of breast reconstruction. This is a separate surgery done to make the reconstructed breast look more like the original breast. It can be done as an outpatient procedure. It’s usually done after the new breast has had time to heal (about 3 to 4 months after surgery).

Ideally, nipple and areola reconstruction matches the position, size, shape, texture, color, and projection of the new nipple to the natural one (or to the other one, if both nipples are being reconstructed). Tissue used to rebuild the nipple and areola comes from the newly created breast or, less often, from another part of your body. In some cases, doctors build up the areola and nipple area with donor skin that’s had the cells removed. If a woman wants to match the color of the nipple and areola of the other breast, tattooing may be done a few months after the surgery.

Some women opt to have just the tattoo, without nipple and areola reconstruction. A skilled plastic surgeon or other professional may be able to use pigment in shades that make the flat tattoo look 3-dimensional (American cancer society 2016.)

8 DISCUSSION

Breast cancer is the most common cancer among women in Finland since 1960's. The incidence is very low among women under 30 years of age but increases after 45 years of age. Breast cancer is hormone related, and the factors that modify the risk of this cancer when diagnosed premenopausal and when diagnosed (much more commonly) postmenopausal are not the same.

In Finland the most common reconstruction is performed with a stretcher and an implant. After mastectomy a balloon (stretcher) is inserted under the skin and chest muscles. Sometimes during mastectomy the skin can be preserved. That would eliminate the need for a stretcher, and a permanent implant (=Becker) can be inserted right away.

The procedure is designed for women who underwent breast amputation after breast cancer or other conditions. Newer techniques allow the surgeon to create a breast which is very similar to the natural one. The reconstruction can be done during the amputation procedure, or a few months or even a year after-wards. The breast can also be reconstructed with body tissue from areas with extra skin and fat, like the tummy, buttocks and back. The tissue being removed is called "a flap".

The purpose of this project was to look at different options of breast reconstruction and nursing care for patients undergoing surgery. The aim of this project was to produce English teaching material for Turku University of Applies Sciences. For students on a nursing point of view in the care of patients undergoing breast reconstruction after having breast cancer.

After our thesis presentation we had discussion with the group. The group was interested about how many surgeries there are in TYKS (Turku University Hospital). Major surgeries like TRAM-flap surgeries are made once a week. And other surgeries almost every or every other day. TRAM-flap surgeries take more monitoring and there for can be done once a week.

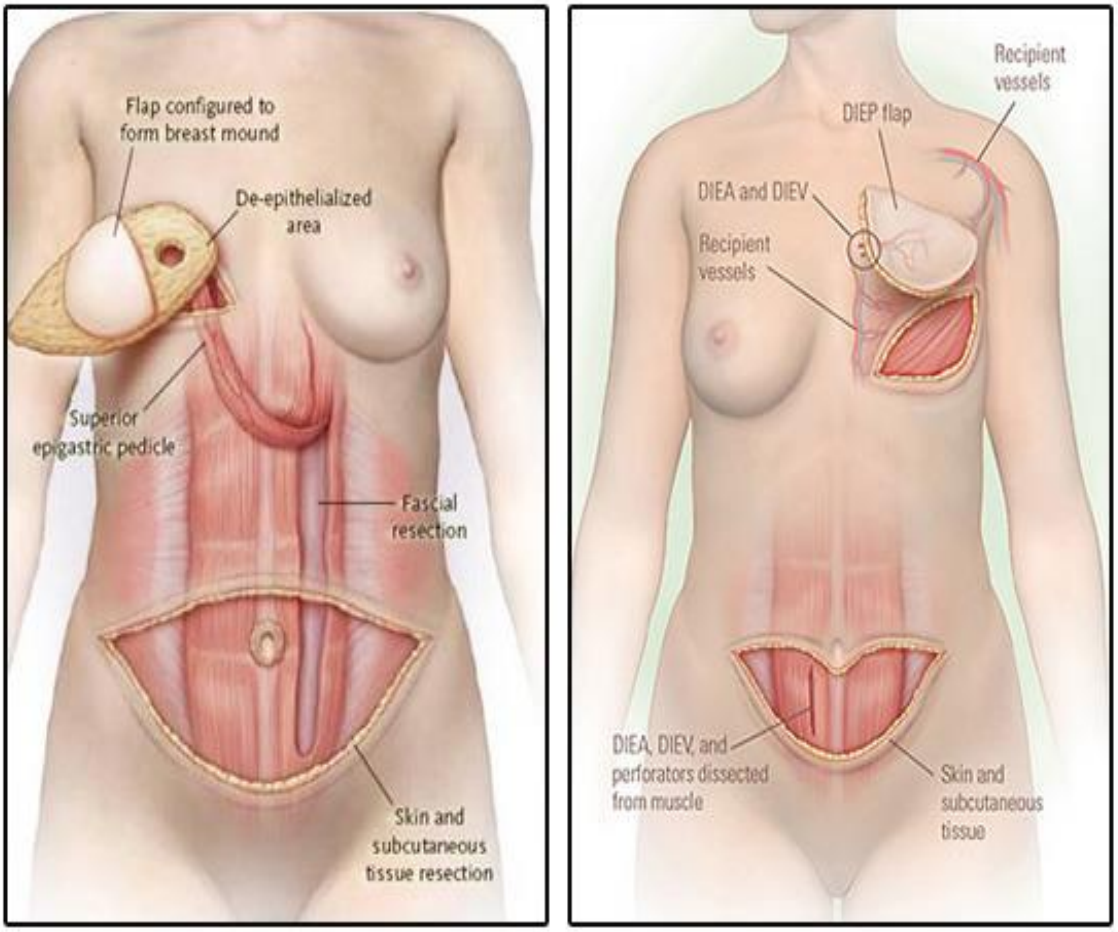
Discussion about who can have these surgeries, like every surgery in Finland can be done to basic healthy person. Always have to keep in mind risks of any kind of surgery.

This information is relevant for all nurses working in operation room, in PACU or in ward. Nurses have different roles of nursing care depending on the working field. Nurses in operation room take care of the perioperative nursing point. Nurses in PACU and ward take care of the postoperative care and teaching of the home care.

Limitations to our work is that every hospital has they own guidelines and every doctor has own preferences. This thesis that we produced is an overall guide for nursing care of a surgical patient with an unique breast reconstruction wound and possibility to two or more surgical sites, autologous flap and microsurgery. We concluded that it would be good to have a consistent approach to the treatment of these patients.

9 PICTURES, FIGURES AND TABLES

Picture 1.



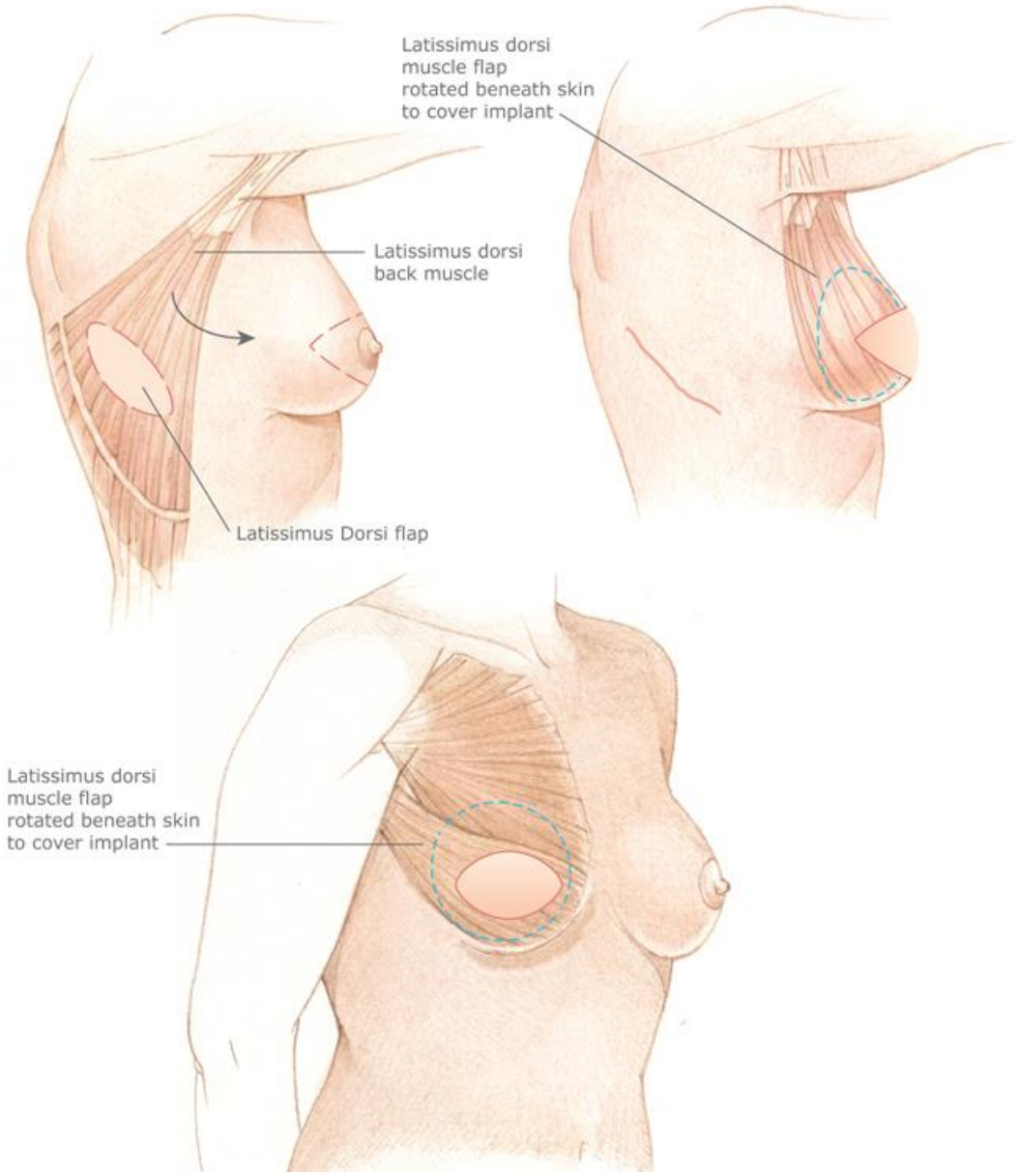
TRAM Flap

Lower abdominal skin, fat and one of the rectus muscle are transferred to the mastectomy site and contoured appropriately to reconstruct the breast.

DIEP Flap

The DIEP flap also uses the skin and fat from the lower portion of the abdomen, but spares the rectus muscle.

Picture 2.



Lattissimus dorsi flap

Picture 3.

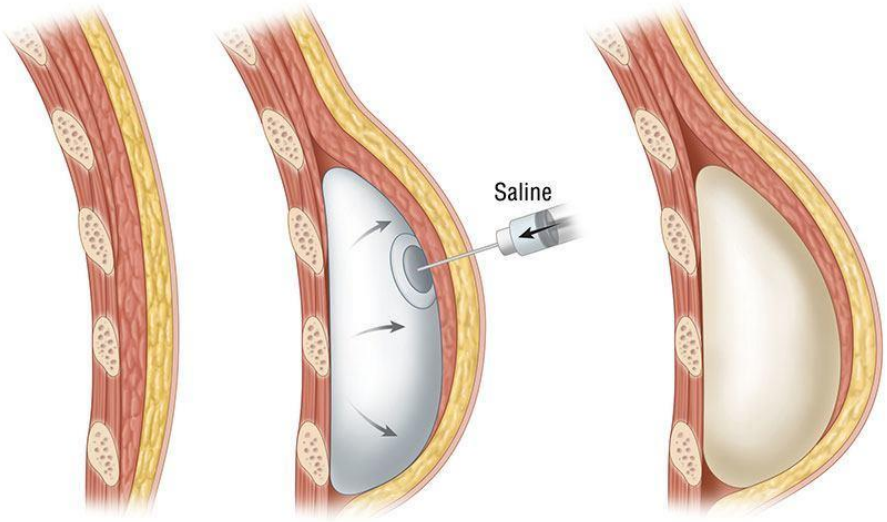
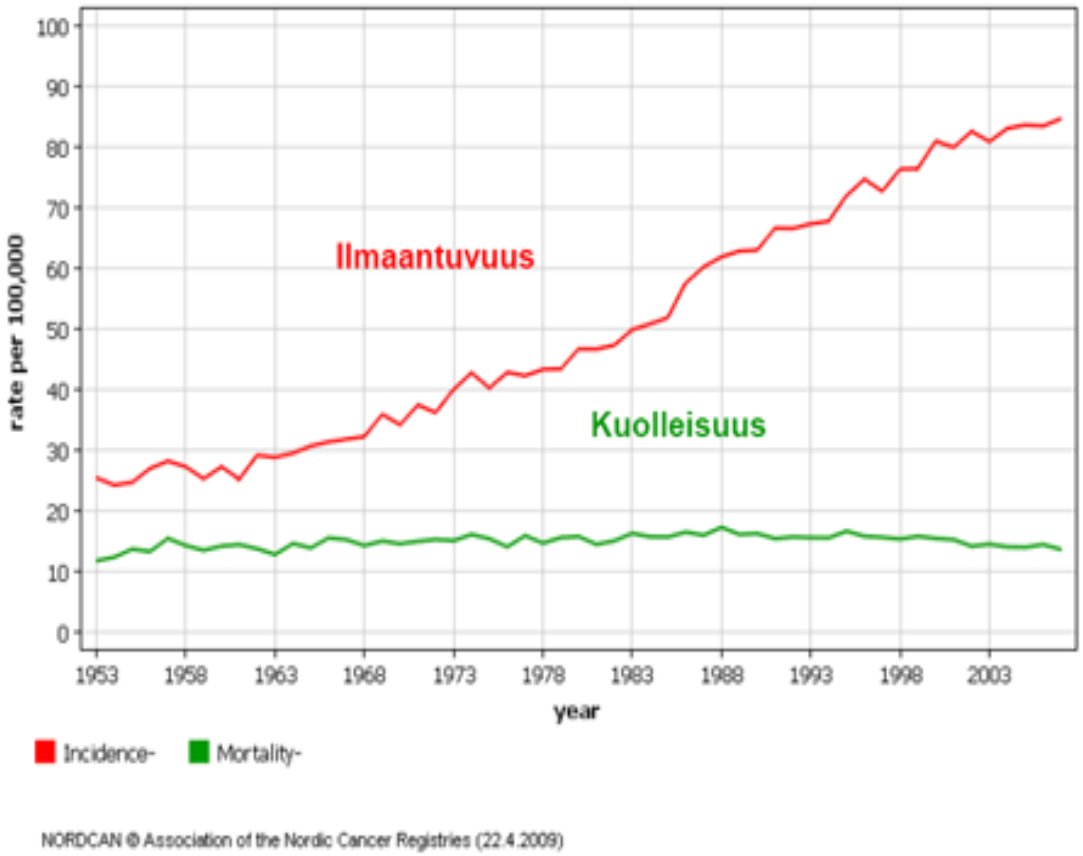


Table1.

Rintasyövän ilmaantuvuus ja kuolleisuus Suomessa 1953-2007



NORDCAN © Association of the Nordic Cancer Registries (22.4.2009)

Table 2.

Complication	***Tissue expander; n = 246***
Skin necrosis	*12 (4.9)*
Wound dehiscence	*10 (4.1)*
Capsular contracture	*9 (3.6)*
Infection	*6 (2.4)*
Hematoma	*3 (1.2)*
Implant rupture	*5 (2.0)*
Removal of tissue expander	*13 (5.8)*
Re-implant	*6*

Data are presented as n (%).

10 REFERENCES

Finland (FI) Breast Reconstruction. 2007. Health Portal. Availablet at: http://immersivemedical.com/breast-reconstruction_finland_2.html [accessed: 25.1.2016]

T.Jahkola,S.Asko-Seljavaara,K.vonSmitten. 2003. Immediate Breast Reconstruction. Scandinavian Journal of Surgery 92: 249–256, [accessed: 25.1.2016]

Hill O; White K. Jan2008. Exploring women's experiences of TRAM flap breast reconstruction after mastectomy for breast cancer. Oncology Nursing Forum. [accessed: 25.1.2016]

Holtzmann J; Timm H. September 2015. The experiences of and the nursing care for breast cancer patients undergoing immediate breast reconstruction. Senior Researcher, University Hospitals Centre for Nursing and Care Research (UCSF). Copenhagen University Hospital, Rigshospitalet, Denmark. [accessed: 25.1.2016]

Fan J, Raposio E, Wang J, Nordsröm R. May 2002. Development of the Inframammary Fold and Ptosis in Breast Reconstruction with Textured Tissue Expanders. Aesthetic Plastic Surgery: Volume 26, Issue 3, pp 219-222. [accessed: 17.4.2016]

Chang CW, Tai HC, Cheng NC, Li WT, Lai HS, Chien HF. 2016. Risk factors for complications following immediate tissue expander based breast reconstruction in Taiwanese population. Published by Elsevier Inc. [accessed: 17.4.2016]

Sanati-Mehrizy P, Massenburg BB, Rozehnal JM, Gupta N, Rosa JH, Ingargiola MJ, Taub PJ. Eplasty. 2015. A Comparison of Postoperative Outcomes in Immediate Versus Delayed Reconstruction After Mastectomy. National Center for Biotechnology Information, U.S. National Library of Medicine: Sep 30;15:e44. eCollection 2015. [accessed: 20.4.2016]

Pusic L, Cordeiro G, 2004. Breast Reconstruction with Tissue Expanders and Implants: A Practical Guide to Immediate and Delayed Reconstruction. Semin Plast Surg: 2004 May; 18(2): 71–77. [accessed: 21.4.2016]

Kadmon, Ilana. 2016 Decision-making styles and levels of involvement concerning breast reconstructive surgery: An Israeli study., January 2016.[Article], [Accessed: 10.2.2016]

Kronowitz SJ,State of the art and science in postmastectomy breast reconstruction. Apr.2015 [Journal Article.] [Accessed: 10.02.2016]

Reish RG; Breast reconstruction outcomes after nipple-sparing mastectomy and radiation therapy, April 2015, [Accessed:10.02.2016]

Hill, Olivia RN; White, Kate RN, PhD,Exploring Women's Experiences of TRAM Flap Breast Reconstruction After Mastectomy for Breast Cancer.2008.[Article], [Accessed: 10.02.2016]

Tsoi B; Safety of tissue expander/implant versus autologous abdominal tissue breast reconstruction in postmastectomy breast cancer patients: a systematic review and meta-analysis., 2014 Feb. [Comparative Study. Journal Article. Meta-Analysis.], [Accessed: 10.02.2016]

Hassey Dow Karen, Contemporary Issues in Breast Cancer: A Nursing Perspective,2nd edition, Jones & Bartlett Learning 2004.

Steligo Kathy, The Breast Reconstruction Guidebook: Issues and Answers from Research to Recovery, JHU Press, 1.11.2012

Hansen Nora M., Management of the Patient at High Risk for Breast Cancer,Springer Science & Business Media, 8.1.2013

Fischer, John P., Nelson, Jonas A., Cleveland, Emily B.A., Sieber, Brady, Rohrbach, Jeff I., Serletti, Joseph M., Kanchwala, Suhail ,Breast Reconstruction Modality Outcome Study: A Comparison of Expander/Implants and Free Flaps in Select Patients, May 2013, Article, Plastic & Reconstructive Surgery,[accessed 10.5.2016]

Xiao-Li Wang, Lin-Bo Liu, Feng-Min Song, Qi-Ying Wang, Meta-analysis of the Safety and Factors Contributing to Complications of MS-TRAM, DIEP, and SIEA Flaps for Breast Reconstruction, 06 June 2014, http://link.springer.com/article/10.1007/s00266-014-0333-3, [accessed:13.5.1]

Cynthia Stermer RN, Helping your patient after breast reconstruction, Nursing2008,August 2008 ,Volume 38 Number 8 pages 28 – 32 [accessed:19.5.2016]

Weaver C. 2009. Caring for a patient after mastectomy. Lippincott Nursing Center: May 2009, Volume 39 Number 5, Pagers 44-48. Available at: http://www.nursingcenter.com/static?pageid=869347 [accessed 20.5.2016]

Feingold R. 2007. Preparing for Surgery. BreastReconstruction.org.[accessed: 2.10.2016]

American cancer society. 2016. Breast Reconstruction After Mastectomy. Available at: http://www.cancer.org/cancer/breastcancer/moreinformation/breastreconstructionaftermastectomy/breast-reconstruction-after-mastectomy-nipple-and-areola-recon [accessed at: 2.10.2016]

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Aihe/ työnimi: Nursing care of mastectomy patients under-going plastic surgery.

Aikataulu: valmis 25.5.2016

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OPINNÄYTETYÖN TOIMEKSIANTOSOPIMUS 2

OPINNÄYTETYÖN SOPIMUSEHDOT*

OHJAUS JA VASTUUT

Vastuu opinnäytetyön tekemisestä ja tuloksista on opiskelijalla. Turun ammattikorkeakoulu vastaa opinnäytetyön ohjauksesta. Toimeksiantaja sitoutuu antamaan opiskelijan käyttöön kaikki opinnäytetyön tekemisessä tarvittavat tiedot ja aineistot sekä ohjaamaan opinnäytetyötä toimeksiantajaorganisaation näkökulmasta.

OIKEUDET

Opinnäytetyön tekijänoikeus kuuluu tekijälle eli opiskelijalle. Tekijänoikeuden lisäksi myös muiden immateriaalioikeuksien osalta noudatetaan kulloinkin voimassa olevaa kyseessä olevaa oikeutta koskevaa lainsäädäntöä.

TYÖSUHDE JA KUSTANNUKSET

Mahdollisesta työsuhteesta, työstä maksettavasta palkkiosta ja työstä mahdollisesti aiheutuvien kustannusten korvaamisesta toimeksiantaja ja opinnäytetyön tekijä sopivat erikseen.

TULOSTEN JULKISTAMINEN JA LUOTTAMUKSELLISUUS

Opinnäytetyöstä laaditaan Turun ammattikorkeakoulun ohjeen mukainen kirjallinen raportti.

Kirjallinen raportti luovutetaan toimeksiantajalle ja asetetaan kirjaston kokoelmiin tai julkaistaan elektronisessa muodossa verkkokirjastossa.

Julkaistava opinnäytetyöraportti on laadittava niin, ettei se sisällä liike- tai ammattisalaisuuksia tai muita julkisuuslaissa (laki viranomaisten toiminnan julkisuudesta) salassa pidettäväksi määrättyjä tietoja, vaan ne jätetään työn tausta-aineistoon. Opinnäytetyön arvioinnissa otetaan huomioon sekä julkaistava että salassa pidettävä osa.

Opinnäytetyön toimeksiantaja ja opiskelija sitoutuvat pitämään salassa kaikki opinnäytetyön tekemisessä ja sitä edeltävissä tai sen jälkeisissä neuvotteluissa esiin tulevat luottamukselliset tiedot ja asiakirjat.

Toimeksiantajan edustajalle varataan mahdollisuus tutustua opinnäytetyöraporttiin viimeistään neljätoista (14) päivää ennen aiottua julkaisemista. Toimeksiantaja antaa työstä ennen edellä mainittua julkaisemisajankohtaa lausunnon, jossa voidaan määritellä opinnäytetyöraporttiin mahdollisesti sisältyvät liike- tai ammattisalaisuudet, joita ei julkaista.

Mitä liike- tai ammattisalaisuuksiin liittyviä asioita ei esitetä opinnäytetyöraportissa?

OLEMME YHTEISESTI SOPINEET OPINNÄYTETYÖN TOTEUTUKSESTA YLLÄ ESITETYLLÄ TAVALLA

4.3.2016 Opiskelija: Jasmin Helle, Sanna Ojaranta
10.3.2016 Toimeksiantaja: Marjale von Schantz

LIITE : OPINNÄYTETYÖSUUNNITELMA ☒

* Turun ammattikorkeakoulun toiminnan yhtiöittämistä vuoden 2014 alusta valmistellaan. Osakeyhtiön toiminnan alettua tämä sopimus siirtyy Turun AMK:n toiminnan vastaanottavalle yhtiölle.

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Teaching material for nursing students: Nursing care of mastectomy patients undergoing plastic surgery

Helle Jasmin Ojaranta Sanna

1

Introduction

- In Finland the most common reconstruction is performed with a stretcher and an implant. After mastectomy a balloon (stretcher) is inserted under the skin and chest muscles. It has a special valve which can be filled from outside. The implant is being filled gradually with a special solution, until the skin has sufficiently stretched for inserting the implant. It takes another 3-6 months until the breast has acquired its final shape, then the nipple can be reconstructed. Sometimes during mastectomy the skin can be preserved. That would eliminate the need for a stretcher, and a permanent implant (=Becker) can be inserted right away.
- Newer techniques allow the surgeon to create a breast which is very similar to the natural one. The reconstruction can be done during the amputation procedure, or a few months or even a year afterwards.
  The breast can also be reconstructed with body tissue from areas with extra skin and fat, like the tummy, buttocks and back. The tissue being removed is called "a flap". Common sites to acquire the flap are the lower tummy and the latissimus dorsi muscle from the back.

2

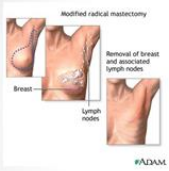
Mastectomy

Mastectomy is the medical term for the surgical removal of one or both breasts, partially or completely.

There are five different types of mastectomy:

- simple or total mastectomy - In this procedure, the entire breast tissue is removed, but axillary contents are undisturbed.
- modified radical mastectomy - The entire breast tissue is removed along with the axillary contents
- radical mastectomy - this procedure involves removing the entire breast, the axillary lymph nodes, and the pectoralis major and minor muscles behind the breast.
- Skin-sparing mastectomy: In this surgery, the breast tissue is removed through a conservative incision made around the areola.
- subcutaneous (nipple-sparing) mastectomy - Breast tissue is removed, but the nipple-areola complex is preserved.

3



4

Immediate OR post-operative breast reconstruction

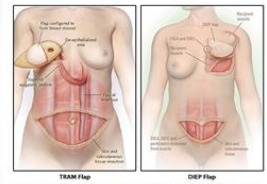
- *Some women decide to have the breast reconstructed, during the same operation that removes the breast. This is called "immediate reconstruction." Other women may wait months or years to have a breast reconstructed (delayed reconstruction).*
  - Postoperative medical and surgical complications in TE/Tissue expander/implant and flap reconstructions was decreased in cases with immediate reconstruction when compared with delayed reconstruction. Immediate reconstruction was associated with decreased rates of return to the OR.
  - Patients with preoperative medical risk factors, such as increased age, higher ASA scores, hypertension, diabetes, smoking, and higher BMI tended to benefit more from immediate reconstructions.
  - Flap failure, however, delayed reconstruction was associated with a protective effect, which may be due, in part, to the low number of reported flap failures.
  - TE/I reconstructions overall had fewer medical or surgical complications than with flap reconstructions.

5

Types of breast reconstruction

- Autologous flaps
  - ➢TRAM-flap
  - ➢DIEP-flap
  - ➢LD-flap
- Breast tissue expander → implant

6



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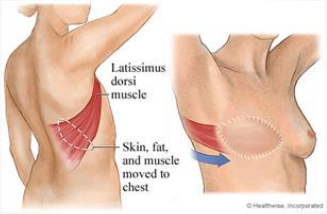

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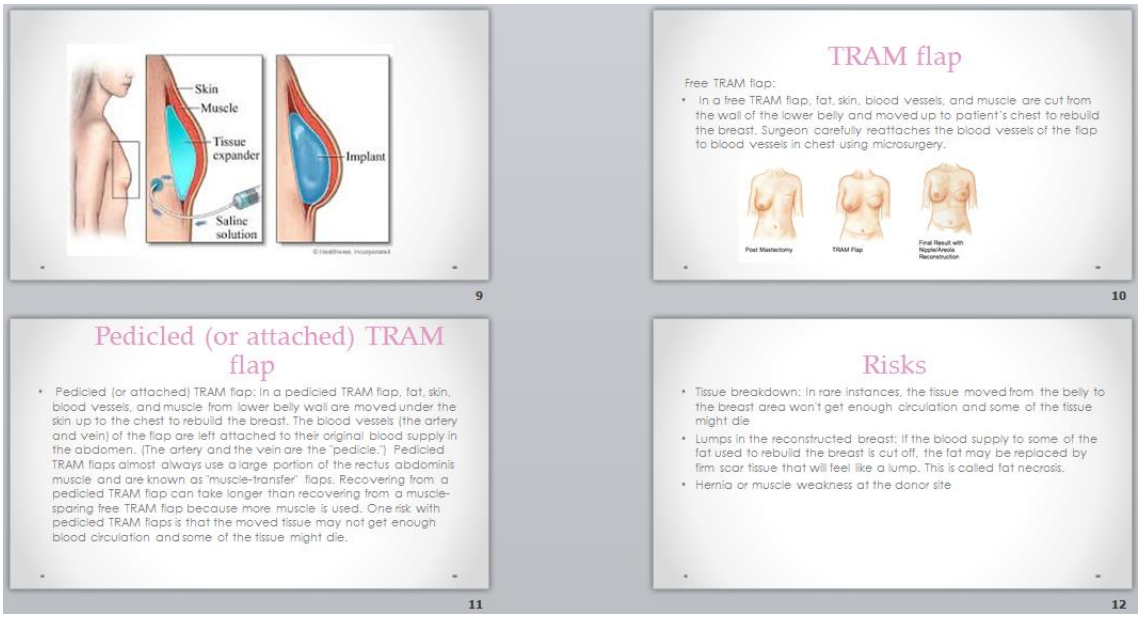
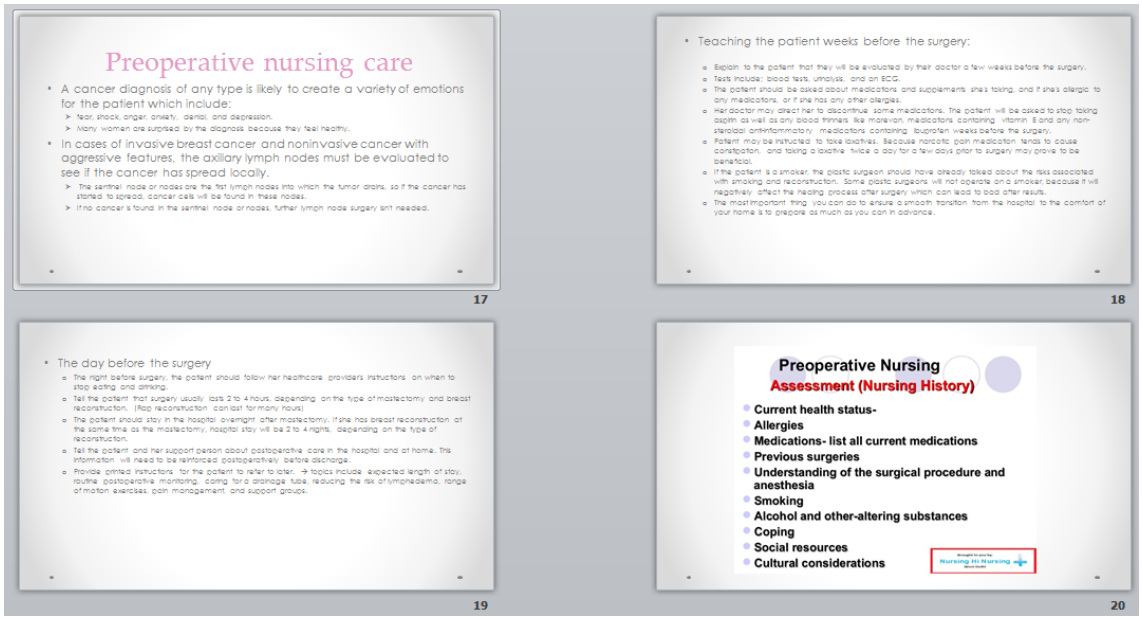

Skin
Muscle
Tissue expander
Saline solution
Implant
9
TRAM flap
Free TRAM flap:
In a free TRAM flap, fat, skin, blood vessels, and muscle are cut from the wall of the lower belly and moved up to patient's chest to rebuild the breast. Surgeon carefully reattaches the blood vessels of the flap to blood vessels in chest using microsurgery.
Post Mastectomy
TRAM Flap
Final Result with Nipple/Areola Reconstruction
10
Pedicled (or attached) TRAM flap
Pedicled (or attached) TRAM flap: In a pedicled TRAM flap, fat, skin, blood vessels, and muscle from lower belly wall are moved under the skin up to the chest to rebuild the breast. The blood vessels (the artery and vein) of the flap are left attached to their original blood supply in the abdomen. (The artery and the vein are the "pedicle.") Pedicled TRAM flaps almost always use a large portion of the rectus abdominis muscle and are known as "muscle-transfer" flaps. Recovering from a pedicled TRAM flap can take longer than recovering from a muscle-sparing free TRAM flap because more muscle is used. One risk with pedicled TRAM flaps is that the moved tissue may not get enough blood circulation and some of the tissue might die.
11
Risks
Tissue breakdown: In rare instances, the tissue moved from the belly to the breast area won't get enough circulation and some of the tissue might die
Lumps in the reconstructed breast: If the blood supply to some of the fat used to rebuild the breast is cut off, the fat may be replaced by firm scar tissue that will feel like a lump. This is called fat necrosis.
Hernia or muscle weakness at the donor site
12
DIEP FLAP
A DIEP flap is similar to a muscle-sparing free TRAM flap, except that no muscle is used to rebuild the breast. (A muscle-sparing free TRAM flap uses a small amount of muscle.) A DIEP flap is considered a muscle-sparing type of flap. DIEP stands for the deep inferior epigastric perforator artery, which runs through the abdomen.
13
LD- FLAP
Latissimus dorsi muscle is located in back, just below behind armpit. It's the muscle that helps do twisting as swinging a racquet or golf club.
In a latissimus dorsi flap procedure, an oval flap of and blood vessels from patients upper back is used breast. This flap is moved under the skin around to breast. The blood vessels (artery and vein) of the flap to their original blood supply in the back.
Because the flap contains a significant amount of muscle, a latissimus dorsi flap is considered a muscle-transfer type of flap.
14
Breast tissue expander
A few months later, the expander is removed and the patient receives either microvascular flap reconstruction, or the insertion of a permanent breast implant.
The expander has a port where the surgeon can add increasing amounts of liquid (a salt water solution) over time between 2 to 6 months until the skin gradually is stretched enough for the final implant reconstruction.
https://www.youtube.com/watch?v=uZkn1IyzO3E
15
Complication
Tissue expanders n = 246
Skin necrosis
12 (4.9)
Wound dehiscence
10 (4.1)
Capsular contracture
9 (3.6)
Infection
6 (2.4)
Hematoma
3 (1.2)
Implant rupture
5 (2.0)
Removal of tissue expander
13 (5.5)
Re-implant
6
Data are presented as n (%).
16



Preoperative nursing care

- A cancer diagnosis of any type is likely to create a variety of emotions for the patient which include:
  - fear, shock, anger, anxiety, denial, and depression.
  - Many women are surprised by the diagnosis because they feel healthy.
- In cases of invasive breast cancer and noninvasive cancer with aggressive features, the axillary lymph nodes must be evaluated to see if the cancer has spread locally.
  - The sentinel node or nodes are the first lymph nodes into which the tumor drains, so if the cancer has started to spread, cancer cells will be found in these nodes.
  - If no cancer is found in the sentinel node or nodes, further lymph node surgery isn't needed.

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- Teaching the patient weeks before the surgery:
  - Explain to the patient that they will be evaluated by their doctor a few weeks before the surgery.
  - Tests include: blood tests, urinalysis, and an ECG.
  - The patient should be asked about medications and supplements she's taking, and if she's allergic to any medications, or if she has any other allergies.
  - Her doctor may direct her to discontinue some medications. The patient will be asked to stop taking aspirin as well as any blood thinners like marevan, medications containing vitamin E and any non-steroidal antiinflammatory medications containing ibuprofen weeks before the surgery.
  - Patient may be instructed to take laxatives. Because narcotic pain medication tends to cause constipation, and taking a laxative twice a day for a few days prior to surgery may prove to be beneficial.
  - If the patient is a smoker, the plastic surgeon should have already talked about the risks associated with smoking and reconstruction. Some plastic surgeons will not operate on a smoker, because it will negatively affect the healing process after surgery which can lead to bad after results.
  - The most important thing you can do to ensure a smooth transition from the hospital to the comfort of your home is to prepare as much as you can in advance.

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- The day before the surgery
  - The night before surgery, the patient should follow her healthcare providers instructions on when to stop eating and drinking.
  - Tell the patient that surgery usually lasts 2 to 4 hours, depending on the type of mastectomy and breast reconstruction. (Flap reconstruction can last for many hours)
  - The patient should stay in the hospital overnight after mastectomy. If she has breast reconstruction at the same time as the mastectomy, hospital stay will be 2 to 4 nights, depending on the type of reconstruction.
  - Tell the patient and her support person about postoperative care in the hospital and at home. This information will need to be reinforced postoperatively before discharge.
  - Provide printed instructions for the patient to refer to later. → topics include: expected length of stay, routine postoperative monitoring, caring for a drainage tube, reducing the risk of lymphedema, range of motion exercises, pain management, and support groups.

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Preoperative Nursing
Assessment (Nursing History)

- **Current health status-**
- **Allergies**
- **Medications- list all current medications**
- **Previous surgeries**
- **Understanding of the surgical procedure and anesthesia**
- **Smoking**
- **Alcohol and other-altering substances**
- **Coping**
- **Social resources**
- **Cultural considerations**

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Postoperative care

Postoperative care for a patient who's undergone autologous breast recon-struction includes:

- the usual postoperative monitoring and strict patient care attention to patient's unique needs.
- Patient has two surgical sites and possibly tunneled tissue and blood vessels that have been reattached by microsurgery.

21

- The anatomy
- the type of mastectomy
- the amount of tissue spared
- damage from radiation
- lymph node dissection

All play a role in reconstruction and aesthetic outcome.

After the surgery patient goes to PACU/ICU to close monitoring, tissue perfusion to the newly created breast. Any decrease in blood flow could lead to a partial or complete loss of the tissue flap.

22

In a ward notify the surgeon immediately of signs of decreased perfusion. A compressed blood vessel or clot formation at the site of anastomosis may be the cause. Monitoring requirements differ between pedicle and free flaps and according to surgeon preference, but generally nurses should assess perfusion to the flap at these intervals:

- pedicle flap, every 4 hours
- free flap, every hour for the first 48 hours
- with any change in flap appearance.
- Maintain fluid balance and hydration, which are important for adequate tissue perfusion. Administer intravenous fluids as ordered until the patient can drink adequately. Advance patient's oral intake slowly to prevent nausea and vomiting; severe vomiting could trigger wound dehiscence.

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Assess

- surgical incisions, including wound edge approximation, and the amount and characteristics of drainage from the incisions and drains. Check for induration, tenderness, and erythema. The surgical drains may remain in place up to 2 weeks, until the drainage measures less than 30 ml in 24 hours.
- signs of infection such as temperature above 38° C or increased warmth, tenderness, or purulent drainage at the incision sites. Apply a soft surgical dressing and a breast or abdominal binder or surgical bra for support. Make sure these binders provide support without impairing circulation.
- patient's pain to aid recovery and prevent pulmonary complications.

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- Bleeding or hematoma or seroma formation can occur at the recipient site or donor site when drainage is inadequate. A seroma usually occurs after the drains are removed. Fluid collecting under the skin can become increasingly uncomfortable and may require aspiration.
- Fat necrosis occurs when the skin has adequate perfusion but the fat doesn't.

Other complications include:

- bulges or hernias at the donor site because of muscle removal or a separation or tear in the abdominal fascia.

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Discussing self-care after discharge

Discussing self-care after discharge and your patient's expectations for recovery will help decrease anxiety and fears about the diagnosis and surgery results. Individualize your instructions for the type of surgery patients had, any complications, and patient´s emotional needs.

Most women who've had autologous breast reconstruction go home with one or more incisional dressings and drains. Teach your patient:

- the signs and symptoms of infection at the incision sites
- show her how to change dressings.
- Explain that the drains will be in place for 1 to 2 weeks, depending on the amount of drainage.
- Have her demonstrate tube stripping, emptying the drainage, and recording the color and amount.

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- Indicate whether she should shower or sponge bathe
- show her how to get a proper fit while wearing a surgical bra. If she wears an abdominal binder for support, show her how to apply it and have her give a return demonstration.
- Recommend that she wear loose clothing and front-button tops for comfort and convenience.
- She may use a pillow to support her arm and shoulder while resting or sleeping.
- Advise your patient to increase her physical activity as tolerated, but for 3 weeks she shouldn't lift anything heavier than 1- 2 kg or reach above her head. The surgeon will recommend stretching exercises, which she can begin in the hospital and continue after discharge.

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references

- Finland (FI) Breast Reconstruction.. 2007 © All rights reserved. Immersivemedical.com Health Portal.
- Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.1, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014.
- T.Jahkola,S.Asko-Seljavaara,K.vonSmitten.. 2003. Scandinavian Journal of Surgery 92: 249–256. Immediate Breast Reconstruction.
- Hill, O; White, K . Jan2008. Oncology Nursing Forum. Exploring women's experiences of TRAM flap breast reconstruction after mastectomy for breast cancer.
- Holtzmann, J; Timm, H. September 2015. Senior Researcher, University Hospitals Centre for Nursing and Care Research (UCSF), Copenhagen University Hospital, Rigshospitalet, Denmark. The experiences of and the nursing care for breast cancer patients undergoing immediate breast reconstruction.
- Hirsch EM, Seth AK, Dumanian GA, Kim JY, Mustoe TA, Galiano RD, Fine NA. Mar 2014. Outcomes of Immediate Tissue Expander Breast Reconstruction Followed by Reconstruction of Choice in the Setting of Postmastectomy Radiation Therapy.
- Pan J, Ragosta B, Wang J, Nordström R. May 2002. Development of the Inframammary Fold and Ptosis in Breast Reconstruction with Textured Tissue Expanders. Volume 26, Issue 3, pp 219-222.
- Chang CW, Tai HC, Cheng NC, Li WT, Lai HS, Chien HF. 2016 Published by Elsevier Inc. Risk factors for complications following immediate tissue expander based breast reconstruction in Taiwanese population.
- Sanati-Mehrizy P, Massenburg BB, Rozehnal JM, Gupta N, Rosa JH, Ingargiola MJ, Taub PJ.Epiasty. 2015. A Comparison of Postoperative Outcomes in Immediate Versus Delayed Reconstruction After Mastectomy. National Center for Biotechnology Information, U.S. National Library of Medicine. Sep 30;15:e44. eCollection 2015. PubMed.
- Kadmon, Ilana Decision-making styles and levels of involvement concerning breast reconstructive surgery: An Israeli study., January 2016.[Article]. Accessed: 10.2.2016
- Campesino, Maureen, Surgical treatment differences among Latina and African American breast cancer survivors., July 2012.[Article] [Online Exclusive Article]. Accessed: 10.02.2016
- Kronowitz SJ.State of the art and science in postmastectomy breast reconstruction.. Apr.2015 [Journal Article.] Accessed: 10.02.2016
- Rolph RG; Breast reconstruction outcomes after nipple-sparing mastectomy and radiation therapy. April 2015. Accessed:10.02.2016

28

- Lynch, Elizabeth,Making an emotive decision, August 31, 2011.[Article], Accessed: 10.02.2016
- Hill, Olivia RN; White, Kate RN, PhD,Exploring Women's Experiences of TRAM Flap Breast Reconstruction After Mastectomy for Breast Cancer.2008.[Article], Accessed: 10.02.2016
- Tsoi B; Safety of tissue expander/implant versus autologous abdominal tissue breast reconstruction in postmastectomy breast cancer patients: a systematic review and meta-analysis., 2014 Feb. [Comparative Study. Journal Article. Meta-Analysis.], Accessed: 10.02.2016
- Hassey Dow Karen, Contemporary Issues in Breast Cancer: A Nursing Perspective,2nd edition, Jones & Bartlett Learning 2004.
- Steligo Kathy, The Breast Reconstruction Guidebook: Issues and Answers fom Research to Recovery, JHU Press, 1.11.2012
- Hansen Nora M., Management of the Patient at High Risk for Breast Cancer,Springer Science & Business Media, 8.1.2013
- Fischer, John P., Nelson, Jonas A., Cleveland, Emily B.A., Sieber, Brody, Rohrbach, Jeff I., Serletti, Joseph M., Kanchwala, Suhail ,Breast Reconstruction Modality Outcome Study: A Comparison of Expander/Implants and Free Flaps in Select Patients, May 2013, Article, Plastic & Reconstructive Surgery,[accessed 10.5.2016]
- Xiao-Li Wang, Lin-Bo Liu, Feng-Min Song, Qi-Ying Wang, Meta-analysis of the Safety and Factors Contributing to Complications of MS-TRAM, DIEP, and SIEA Flaps for Breast Reconstruction, 06 June 2014, http://link.springer.com/article/10.1007/s00266-014-0333-3, [accessed:13.5.16

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