

행복직근 유리근피부피판 유방재건에서의 심부정맥혈전증 및 폐색전증

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Breast Reconstruction with Free Transverse Rectus Abdominis Myocutaneous Flap Complicated by Deep Vein Thrombosis-associated Pulmonary Thrombo-embolism

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Over the last few decades, autologous tissue has gained an increasing popularity as a mean of immediate breast reconstruction after oncological mastectomy. Especially in the case of delayed reconstruction or radiotherapy done or planned, autologous reconstruction is often preferred over implants. Transverse rectus abdominis myocutaneous flap is, by far, the most universally adopted selection of choice. During the last 5 years, breast reconstruction using a free transverse rectus abdominis myocutaneous flap summed up to a total of 706 cases in our institution. In this paper, we present 2 cases, in which, deep vein thrombosis and pulmonary thrombo-embolism were complicated post-operatively in patients who underwent breast reconstruction with a free transverse rectus abdominis myocutaneous flap.

Key Words: Venous thrombosis, Pulmonary embolism, TRAM

Deep vein thrombosis (DVT) with associated pulmonary thrombo-embolism, once presented, is deemed one of the most fatal post-operative complications. This is well-documented in the literature written especially by general or orthopedic surgeons¹. However, in the field of plastic surgery, such a phenomenon is not so common. Exact pathophysiology of the DVT in transverse rectus abdominis myocutaneous (TRAM) patients is still under

controversy, and there is much to debate regarding the use of pre-operative anti-coagulative prophylaxis. Nevertheless, as presented in these case reports, pulmonary thrombo-embolism can rise to the surface any time in TRAM patients. Despite the rarity, pulmonary thrombo-embolism may manifest as a deadly complication, and in this way, precaution is always encouraged.

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CASE REPORTS

1. Case 1

A 48-year-old female with 4.5 cm-sized left breast infiltrating ductal carcinoma was scheduled for left total mastectomy with level II axillary lymph node dissection on August 10, 2012. After 2 years of cancer-free periods, delayed breast reconstruction was planned.

The patient denied of any family history of cancer. No previous medical history other than underlying adenomyosis was found in her medical records. She weighed 59.95 kg with a height of 161.0 cm (body mass index [BMI] of 23.13 kg/m²), and her preoperative American Society of Anesthesiologists (ASA) grading was class I.

Prior to mastectomy, she went through a total of 8 cycles of neoadjuvant chemotherapy using regimens including Adriamycin, Cytosin, and Docetaxel. Adjuvant hormone therapy using Tamoxifen and radiotherapy on the left chest wall and axilla were followed.

On October 16, 2014, after excision of scar tissue and release of contracture on her left breast previous surgical site, free TRAM flap was elevated for delayed breast reconstruction. The surgery proceeded uneventfully. The 555 g of flap was harvested in muscle-sparing type I pattern. Of the harvested flap, 505 g was inset into the left

breast in a horizontal direction with end-to-end micro-anastomosis between left deep inferior epigastric artery and vein and left internal mammary artery and vein.

During the post-operative care at general ward, no significant events were noteworthy other than surgical site discomforts. On the seventh day post-operatively, the patient was discharged from the hospital with all surgical drains removed.

On October 28, 2014, the patient visited emergency room for pain, swelling, and claudication on her left calf, which started 2 days ago. Imaging work-ups including Doppler sonography (Fig. 1) and computed tomography (CT) scans on lower extremity revealed extensive acute DVT in the left common iliac vein to crural veins. Her initial vital signs were stable with no notable signs of dyspnea. However, CT scans on the chest uncovered a small burden of pulmonary thrombo-embolism in the patient's right lower lobe segmental artery (Fig. 2).

Immediately, she was transferred to the Department of General Surgery for anti-embolitic management. Considering less than two weeks elapsed since major surgery, inferior vena cava (IVC) filter was deemed more advantageous than primary anti-coagulative or thrombolytic therapies. On the day after admission, the patient underwent a sonography-guided IVC filter insertion. On No-

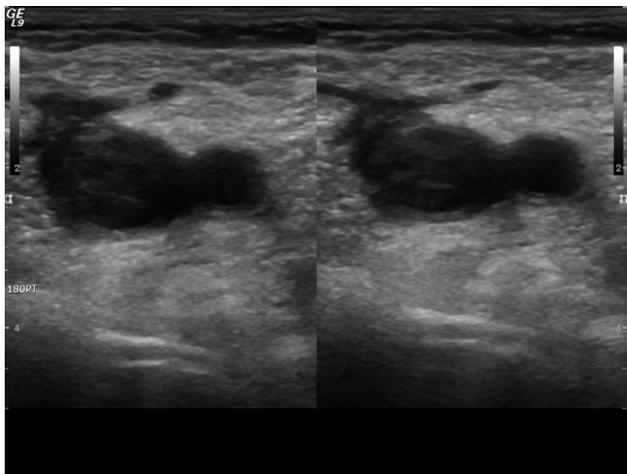


Fig. 1. Lower extremity Doppler sonography with acute deep vein thrombosis in the left common iliac and femoral vein to crural veins.



Fig. 2. Chest computed tomography angiography with pulmonary artery embolism on right lower lobe.

vember 5, the patient was sent home with prescription of oral warfarin. Throughout the entire course of events, flap stayed stable. A 2-year follow-up did not show any recurrence of neither DVT nor pulmonary thrombo-embolism, and also, an excellent reconstructive result, as well.

2. Case 2

A 51-year-old woman presented with a bloody discharge from her right nipple. The preliminary evaluations done at outside hospitals suspected atypical ductal hyperplasia and fibro-cystic change, and for this, she underwent a couple of breast-conserving surgeries on year 2006 and 2010, respectively. However, during her post-operative routine follow-ups, she was diagnosed with an approximately 4 cm-sized right breast ductal carcinoma in-situ. Without any pre-operative neoadjuvant therapy, she was planned for another breast-conserving surgery on December 11, 2014. Post-operative permanent biopsy disclosed remaining tumors on superior, inferior, lateral and medial resection margins. On January 16, 2015, additional surgical procedure was scheduled for total mastectomy and immediate breast reconstruction.

The patient denied of any family history of cancer. However, previous operation histories included laparoscopic myomectomy for uterine myomectomy on year 2006 and gamma-knife surgery for brain avascular malformation in 2013. She weighed 64.70 kg with a height of 159.1 cm (BMI of 25.56 kg/m²), and her preoperative ASA grading was class I.

At surgery, the total mastectomy was performed by general breast surgeons. Breast skin paddle with dimension of 10×4 cm was excised in an elliptical fashion, and the total mass of breast tissue excised weighed 255 g. Then, free TRAM flap was elevated in a muscle-sparing type II pattern with the initial flap weighing 845 g. With a careful consideration of the total breast mass excised during the series of previous surgeries, a 660 g flap was inset into the patient's right breast in a vertical direction. End-to-end microanastomosis were done between right deep inferior epigastric vessels and right internal mammary vessels. Overall, the surgery was done uneventfully.

No notable complications were reported during post-operative periods. On the eighth day after surgery, the patient was sent home with all surgical drains removed prior to her discharge.

On January 30, 2015, the patient presented to emergency room with a left lower leg edema that is alleged to have started immediately after her last surgery and aggravated 2 days ago. On physical examinations, the edema was pitting in nature. Screening Doppler sonography detected acute DVT from left common iliac vein to popliteal vein, and its distal branches (Fig. 3). Further imaging work-ups using chest CT scans revealed pulmonary artery embolisms in the both lower lobes (Fig. 4). Upon her arrival, the patient did not show any symptoms of dyspnea neither at resting nor on exertion states. Her initial vital signs were stable.

Once admitted to the emergency ward, the patient started anti-coagulative therapy using subcutaneous injection of Dalteparin 12,500 IU. IVC filter was taken into considerations; however, the intervention was not put into action due to symptom's onset longer than 2 weeks ago. On February 3, the 4th day after her admission, the patient was discharged from the hospital with supervision to continue anti-coagulation for the next 6 months. Flap remained stable during the course of the events. A 2-year follow-up showed satisfactory reconstructive result, and

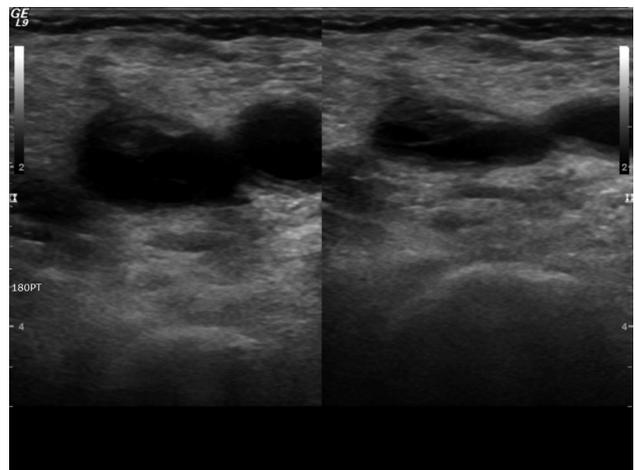


Fig. 3. Lower extremity Doppler sonography with acute deep vein thrombosis from left common iliac and femoral vein to popliteal vein, and its distal branches.

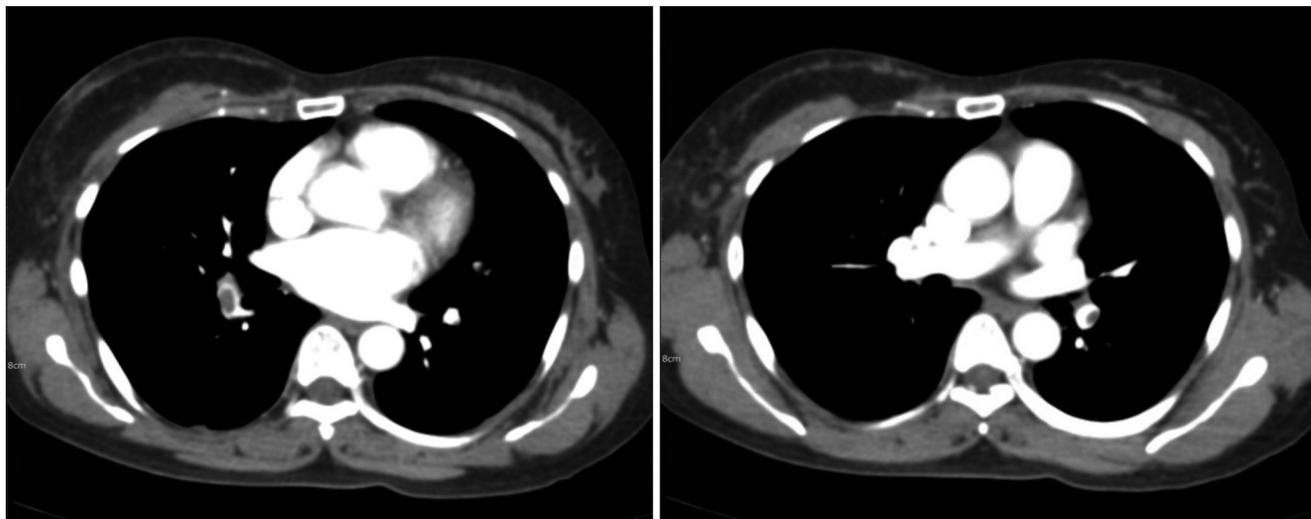


Fig. 4. Chest computed tomography angiography with pulmonary artery embolism on both lobes.

the patient was not subject to any relapse of DVT or pulmonary thrombo-embolism.

DISCUSSION

Of the 706 female patients who underwent breast reconstruction using a free TRAM flap in our institution over the last 5 years, DVT and pulmonary thrombo-embolism were complicated in a total of two cases.

DVT and consequent pulmonary thrombo-embolism may account for as high as 5% of total post-operative mortality². Yet, as in our institution, the reported incidence rate is relatively low. The incidence of clinically significant event is even lower. Nevertheless, clinical vigilance is recommended due to its potential high fatal nature. In addition, when the appropriate treatment is delayed, the patient may also have to face consequent morbidity or even mortality. Furthermore, we should never overlook the subclinical thrombo-embolism, which bears a possibility of lethal manifestation^{3,4}. In this sense, it is not appropriate to approach this phenomenon solely based on its incidence rate.

Obesity is one of the known risk factors of DVT and pulmonary thrombo-embolism in post-operative circumstances⁵⁻⁷. Though, both patients in this case report did not qualify for this criterion. Previous studies have revealed that the procedure of elevating abdominal flap

is likely to intervene with superficial venous flow from lower extremities and pelvic zone⁸. So far, the interference with venous return is perceived as the most persuasive theory that backs up the increased risk of DVT in breast cancer patients with free TRAM flap.

Nowadays, growing concerns are raised for the need for a safe and effective measure to prevent DVT in post-operative TRAM patients. In fact, prophylactic use of low-molecular-weight heparin is now routinely practiced in certain institutions. According to the authors, the prophylactic dosage does not significantly increase the risk of post-operative bleeding⁹. Though, considering relatively low incidence rate of the clinically significant event and with the paucity of evidences to establish prophylactic anti-coagulation prior to TRAM surgery, it still depends on the operators, themselves, whether to adopt such a prophylactic measure in their own patients.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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지난 몇 십 년간, 유방 전절제술 후 유방 재건에 있어 자가조직을 이용한 방법은 지속적인 인기를 얻고 있다. 특히 지연 재건이나 술 전 또는 후 방사선 치료가 계획되어 있는 경우, 보형물보다 자가조직을 이용한 재건이 더 선호되고 있는 실정이다. 그 중에서도 횡복직근 유리근-피부피판은 단연 가장 널리 이용되는 공여부이다. 지난 5년간 본 원에서는 총 706건의 횡복직근 유리근-피부피판을 이용한 유방재건이 시행되었으며, 그 중 심부정맥혈전증 및 이와 관련된 폐색전증이 합병된 총 두 건의 증례를 보고하고자 한다.

색인단어: 정맥혈전증, 폐색전증, 유리피판

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