Case Report

The combination of breast necrosis and chylothorax following the OPCAB

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Abstract
Due to long term patency, the internal mammary artery is considered as a conduit of choice for revascularization of the left anterior descending coronary artery. The internal mammary artery and its accessory branches in addition to perfusing the chest wall structures also contributes to supplying, part of the female breast arteries. In addition, due to the accompaniment of thoracic duct branches with the left internal mammary artery, harvesting may be associated with injury to these branches and contribute to chylothorax. We report a rare case of chylothorax and the breast necrosis following the coronary artery bypass grafting. The chylothorax was started in the second postoperative day and ceased gradually in the 12th day of operation. The breast necrosis appeared in the 3th weeks of operation with pain, and tenderness and black skin color change. The patient underwent total mastectomy in the 4th weeks of operation.

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Introduction
The blood supply of the breast arises primarily from both left and right thoracic internal mammary arteries (LIMA,RIMA) intercostal artery and the subclavian artery. These arteries runs below the pectoralis muscles and overlying breast and the chest wall muscles. The internal thoracic arteries not only provide nutrients and oxygen, to the breast tissue but also accompany its specific lymph vessels that provide lymph drainage of thoracic organs between them is lung tissue. The damage to branches of thoracic lymph ducts during harvesting may be associated with chylothorax. In women undergoing coronary artery bypass grafting (CABG) with LIMA use, breast necrosis is more likely to occur in women who have huge breast tissue, atherosclerotic risk factors such as chronic hypertension, diabetes, and hyperlipidemia. In opposed to main LIMA artery that is not involved in the atherosclerotic process, LIMA branches may be involved by atherosclerosis and could be contributing to breast ischemic changes. Perforating branches of LIMA that deeply located in the pectoralis muscles may be also involved in atherosclerosis process could be considered as a risk factor in the necrosis of huge breast, breast of patient with diabetes and microvascular disease or history of smoking or opium using. Necrosis of the breast is an exceedingly rare phenomenon, accounting for less than 0.001% of all post CABG complications, however the incidence of chylothorax is much higher. Breast necrosis is often limited to a small area in the central zone, but in our patient, due to severe damage to harvesting site, this zone was wider and was associated with chylothorax.

Case Report
A 68-year-old female admitted to our center with severe chest pain that exaggerated with exertion. Left main coronary artery disease was confirmed by angiography. During the physical exam no evidence of lump or others skin lesion were found. There was also no history of trauma, surgery or irradiation to the breast. The patient had a history of a diabetes, hypertension and smoking. A chest x-ray was within normal limits. The CABG was performed by OPCAB method and use of conduit grafts such as saphenous graft and LIMA. LIMA harvesting and preparation was performed by training resident, using a similar surgical technique in our center. Following median sternotomy, the left half of sternum was elevated using IMA Retractor. The pleura was opened longitudinally according to subject’s discretion. The IMA routinely harvested as a pedicled graft, a large pedicle containing the IMA, accompanying with double veins, endothoracic fascia, fat, and lymphatics tract and lymphatics node and some times, thin layer of intercostals muscle that was mobilized using low voltage bipolar electrocautery. Using the tip of the electrocautery as a dissector, the branches of the IMA were exposed, clipped proximally and distally, and transected using thin scissors. Revascularization of the left anterior...
Breast Necrosis after CABG

The incidence of post-CABG breast necrosis is very low in the medical literature that none of them occurred in combination with chylothorax. The rarity of this complication in OPCAB could be explained by lower chance of injury to the thoracic duct during surgery. In opposed to off-pump surgery some additional procedures may be performed in on-pump CABG such as „snaring of SVC, handling of ascending aorta, aortic cross clamping that may further increase the risk of chylothorax. Other possible etiologies have been proposed, such as increased superior vena cava pressure due to use of tapes or to venous thrombosis during cardiopulmonary bypass. In addition, injury to a large branch of thoracic duct may be occurred during dissection of thymus or LIMA harvesting close to subclaveian artery.

Discussion

Due to abundant collateral arteries arises from six important branches of subclaveian and axillary artery, the complications of LIMA harvesting are rare after CABG, but huge breast size in any rare case may be perfused selectively from lima artery and its inappropriate harvesting with large pedicle may predispose the breast to necrosis. In other hand risk factors such as hypertension, diabetes and smoking and renal failure may aggravate the atherosclerotic change in the deeply located perfusing arteries. The post CABG chylothorax has many etiologies, such as LIMA, RIMA harvesting, thymus handing, ascending aortic clamping, snaring of the SVC or IVC, pulmonary hypertension. The incidence of post-CABG breast necrosis is very low in the medical literature that none of them occurred in combination with chylothorax. If we consider the huge number of CABG that performed annually in word, the reported cases of chylothorax is an exceedingly rare complication. The rarity of this complication in OPCAB could be explained by lower chance of injury to the thoracic duct during surgery. In opposed to off-pump surgery some additional procedures may be performed in on-pump CABG such as „snaring of SVC, handling of ascending aorta, aortic cross clamping that may further increase the risk of chylothorax. Other possible etiologies have been proposed, such as increased superior vena cava pressure due to use of tapes or to venous thrombosis during cardiopulmonary bypass. In addition, injury to a large branch of thoracic duct may be occurred during dissection of thymus or LIMA harvesting close to subclaveian artery.

Conclusion

Our patient was a smoker, opium addicted, hypertensive and diabetic case that also had a large breast, the combination of these risk factor associated with unknown anomaly of breast supplying arteries may provided an appropriate basis that aggravate with invasive LIMA harvesting in occurrence of breast necrosis. We believe that in patient with aforementioned risk factors the best strategy to prevent or reduce the risk of this complication is LIMA harvest with...
skeletonized.

**Ethical approval**
The study was approved by the Local Ethics Committee.

**Competing interests**
Authors declare no conflict of interests in this study.

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