Editorial

Metabolic syndrome and outcome after breast reconstruction

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Abstract: Metabolic syndrome with its core components including obesity, insulin resistance, dyslipidemia and hypertension; is has been proven as a multiplex risk factor for cardiovascular disease. It is also recently shown by meta-analysis for its association with increased risk of common cancers including breast cancer. Multiple studies have shown metabolic syndrome prone to have poor perioperative outcome and complications for multiple type of surgery including vascular and flap surgery due to compromising microvascular circulation in this group of patient. However, lack of data on consequences of metabolic syndrome on breast cancer surgery as well as in breast reconstructive surgery indicate the need of further study in this area for the improvement of outcome of breast cancer and reconstructive surgery.

Keywords: Metabolic syndrome; breast cancer; obesity; breast reconstruction

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Breast cancer is now the most common cancer among women with an estimated 1.38 million new cancer cases diagnosed in 2008 (23% of all cancers) (1), and only in the United States 211,731 women were diagnosed with breast cancer in 2009. Incidence rates vary between different regions, but there are higher in developed regions. Although, breast cancer stills the most frequent cause of cancer death in women in both developing and developed regions, mortality from breast cancer has been declining in developed countries over the last two decades due to the advancement in treatment and diagnostic procedures. However, today more favorable result of breast cancer maybe not only to cure and save lives, but also to save or rebuild their breasts to maintain the body image and self-esteem. As a result, breast conservation surgery can be another choice to response with patient physical and emotional need to recreate the shape of the breast following a breast cancer surgery.

Considering breast reconstructive surgery, several types of procedures are available using implant, tissue flap, or a combination of both. According to operation using flap techniques, healthy blood vessels are needed for the tissue's blood supply, so flap procedures are not usually offered to women risk with vascular problems.

On the other hand, from researches many risk factors for breast cancer have been well documented and several studies have shown the association of the metabolic syndrome and its individual components with breast cancer (2-5). More recent studies have shown it to be an independent risk factor for breast cancer. It has also been associated with poorer prognosis, increased incidence, a more aggressive tumor phenotype (6-9). The contribution of various modifiable risk factors, excluding reproductive factors, to the overall breast cancer burden has been calculated by Danaei *et al*. (10). They conclude that 21% of all breast cancer deaths worldwide are attributable to alcohol use, overweight and obesity, and physical inactivity. This proportion was higher in high-income countries (27%), and the most important contributor was overweight and obesity.

Metabolic syndrome is identified as a multiplex risk factor for cardiovascular disease and metabolic syndrome is also known for its association with increased risk of common cancers; for some cancers, the risk differs between sexes, ethnics group, and definitions of metabolic syndrome. Overall From the meta-analysis and the systematic review presence of metabolic syndrome was associated with breast

postmenopausal, endometrial, pancreatic, rectal, and colorectal cancers in women, and it was associated with liver, colorectal, and bladder cancer in men (11). The evidence indicates the increasing prevalence of metabolic syndrome. The clustering of risk factors that constitute the metabolic syndrome is found to be common in most countries of the world. In the Americas, in Europe, and in India, at least one-fourth of the adults carry the syndrome (12). Considering criteria diagnosis, a number of expert groups have developed clinical criteria for the metabolic syndrome. The most widely accepted of these have been produced by the WHO, the European Group for the Study of Insulin Resistance (EGIR), and NCEP ATP III (13). But all groups agree on the core components of the metabolic syndrome including obesity, insulin resistance, dyslipidaemia and hypertension. However, they apply the criteria differently to identify such a cluster. The risk for ASCVD accompanying the metabolic syndrome is approximately doubled compared with an absence of the syndrome (14). It also associated with a very risk for type 2 diabetes or with diabetes itself, the likelihood of developing diabetes is increased approximately 5-fold. In addition, the metabolic syndrome is often associated with other medical conditions, notably, fatty liver, cholesterol gallstones, obstructive sleep apnea, gout, depression, musculoskeletal disease, and polycystic ovarian syndrome. For the reason, metabolic syndrome undoubtedly affects a surgical result.

There are many researchers studied about effects of metabolic syndrome on surgery outcomes.

Metabolic syndrome has previously been found as a risk factor for poor outcomes for vascular surgery. For instance, metabolic syndrome associated with an increase in mortality and morbidity both early and late after coronary artery bypass grafting (15). Patients with metabolic syndrome have lower survival and cumulative patency rates of hemodialysis access patency (16), metabolic syndrome patients required more complex interventions, more systemic complications and major adverse limb events, and associated with poorer symptomatic and functional outcomes compared with control in superficial femoral artery interventions (17). From many researches, metabolic syndrome also affects the outcome of organ transplantation surgery. It is a risk factor for allograft failure after kidney transplant (18-21), and presence of metabolic syndrome developed a higher risk of cardiac allograft vasculopathy (CAV) in the heart transplant patients. Patients with more criteria of metabolic syndrome had a higher development of CAV (21). There is also a strong correlation between truncal obesity, which is a component of MS and skin graft failure (22). The MS is associated with faster bioprosthetic valve degeneration in patient underwent aortic valve replacement (23).

Moreover in other types of surgery metabolic syndrome also associated with the adverse outcomes. For examples, metabolic syndrome is an independent risk factor for the development of major complications, nonroutine discharge, and increased hospital cost among total joint arthroplasty recipients (24). Colorectal patients with metabolic syndrome had a higher rate of postoperative complication and a longer length of hospital stay than patients without metabolic syndrome (25). Metabolic syndrome is associated with increase perioperative mortality in hepatectomy (26).

In addition, there is a relationship between metabolic syndrome and post-operative surgical wound infection in coronary artery bypass graft patients (27-29).

As a result from the available evidence base medicine and literatures, the author set a hypothesis that metabolic syndrome may effect result of breast cancer surgery and breast reconstructive surgery. However, there is no available research study about this association. As a result, Further researches are needed to answer this question, and for the improvement of outcome in breast cancer and reconstructive surgery.

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