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CASE REPORT
Breast

Microvascular Thrombosis in Celiac Disease: Is Free Flap an Option? Case Presentation and Literature Review

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Summary: Celiac disease is an autoimmune disease that occurs due to gluten intolerance. The prevalence of breast cancer among celiac disease patients is the same as in the general population. It is of note that breast cancer is the most common type of cancer in women. Following mastectomy, these patients visit plastic surgeons for breast reconstruction. Based on various factors, autologous reconstruction using abdominal-based flaps is the best option. Patients with celiac disease have a high incidence of thromboembolic disorders, which may prevent plastic surgeons from doing breast reconstruction with free flaps. We present a case of a patient with celiac disease who underwent a free flap for breast reconstruction with an uneventful course after using our routine postoperative protocol. This case report highlights that patients with celiac disease cannot be denied the option of breast reconstruction with free flaps. *(Plast Reconstr Surg Glob Open 2024; 12:e5890; doi: 10.1097/GOX.0000000000005890; Published online 10 June 2024.)*

Celiac disease or coeliac disease (CD) is an autoimmune, chronic, inflammatory, and systemic condition that can be triggered by exposure to the dietary protein gluten.[1] Typical clinical presentations involve intestinal symptoms, but extraintestinal manifestations are quite common.[2] Among extraintestinal pathologies, the involvement of the hematological system is a significant concern to a microvascular surgeon because of hypercoagulability.

A recent systematic review of all published cases has indicated a link between CD and a hypercoagulable state. Furthermore, the review demonstrated a correlation between CD and venous thrombotic events (TEs), such as deep vein thrombosis (DVT) and pulmonary embolism (PE).[3] To our knowledge, none of the reported cases, case series, or review articles discussed the role of hypercoagulable states in CD patients in the context of microsurgery. This aspect is crucial in making a shared patient–physician decision for breast reconstruction surgery. In this article, we present a case where a patient with CD underwent breast reconstruction surgery by a deep inferior epigastric artery perforator (DIEAP) flap, and explored the literature regarding the risk of thromboembolism and CD and how it may affect patients undergoing microsurgery, and whether the DIEAP flap should be considered as a viable option in these patients.

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CASE PRESENTATION

A 41-year-old woman presented to our clinic seeking breast reconstruction surgery. She was known to have CD and hypothyroidism, for which she was adhering to a gluten-free diet and taking treatment for hypothyroidism. She was diagnosed with left breast invasive ductal carcinoma. She received neoadjuvant chemotherapy followed by a left-modified radical mastectomy 3 years ago. Following that, she underwent radiation therapy and has been on hormonal therapy for nearly 9 months. Her prior surgical history includes a lower segment cesarean section 17 years before. Upon examination, the patient had a left mastectomy scar and a right breast cup size C with grade II ptosis. An abdominal examination revealed a low transverse scar with enough skin and adipose tissue, making her a candidate for abdominal-based reconstruction.

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The patient underwent a left breast reconstruction by DIEAP flap procedure. The procedure was uneventful, although the course of the perforator was within fibrous scar tissue secondary to an old transverse cesarean section, making the dissection challenging. For postoperative care, we followed our protocol, which included applying pneumatic compression, mobilization, hydration, and administration of aspirin for 4 weeks along with low-molecular-weight heparin (40 mg subcutaneously daily for 2 weeks). As an extra precaution in this case, every day during her hospital stay, the patient was assessed twice a day for signs and symptoms of DVT (ie, check for leg pain, swelling, or calf tenderness) and PE (ie, assess for any new onset chest pain, dyspnea, tachycardia, or tachypnea), along with close monitoring of her coagulation profile results every couple of days. The patient experienced a full recovery with a healthy flap and healed donor site with no thromboembolic event or anastomoses thrombosis. The patient was satisfied with her reconstruction when seen at 3 months postreconstruction (Figs. 1–3).

DISCUSSION

As a consequence of CD, a group of manifestations arises that can be either intestinal or extraintestinal. These often coexist, with one being the cause of the other.[1] Notably, one of the extraintestinal manifestations is hypercoagulability, which is of interest to a microvascular surgeon. Proposed explanations have been described for increased thrombosis risk because of CD. One of them is due to the given nature of the autoimmune reaction of CD and chronic inflammatory status that can lead to endothelial damage, therefore increasing the likelihood of atherosclerosis and plaque formation.[4] Another suggested pathophysiology is that malabsorption in CD patients can lead to deficiencies in multiple vitamins. For instance, vitamin K deficiency is particularly crucial as it contributes to protein C and protein S deficiency, resulting in hypercoagulation and thrombus formations.[5,6] All these potential secondary complications of intestinal symptoms can be prevented or managed to some extent by adhering to a gluten-free diet, with the risk heightened in cases of nonadherence.[3,7] A systematic review by Pantic et al, which included a total of 55 cases of patients with CD who developed TEs, reported that CD is considered the only possible risk causing the hypercoagulable state and provoked TEs in 58% of total

Fig. 1. A 3-month postoperative patient photograph, frontal view.

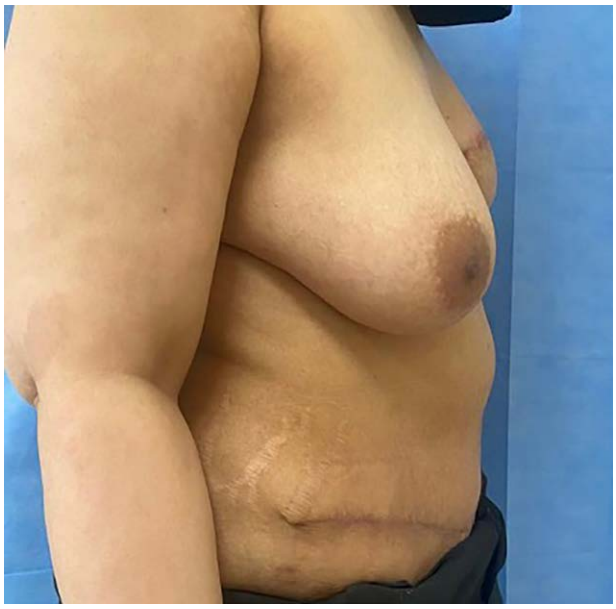

Fig. 2. A 3-month postoperative patient photograph, side view.

Fig. 3. A 3-month postoperative patient photograph, side view.

cases. Of these 55 cases, 80% developed venous thrombosis, 17% developed arterial thrombosis, and the remainder developed both venous and arterial thrombosis. Among those cases, DVT of the lower extremity was the second most common site of thrombosis, followed by PE.

An important consideration in this patient's history is her use of hormonal therapy. The decision to either withhold or continue hormonal therapy was made after consideration of her breast cancer history, with the goal of not interfering with her oncology treatment plan. In a study by Tran et al, they discussed whether continuing hormonal therapy is associated with higher thrombosis risk and flap failure. They found that there was no clinically significant risk associated with keeping patients on hormonal therapy.[8] Furthermore, it is relevant to note that other risk factors were mentioned, such as receiving chemotherapy, radiotherapy, and having delayed breast surgery, which can compromise the recipient tissue bed and vascularity. The presence of these risk factors collectively contributes to the overall risk of thrombosis.

As part of the preoperative assessment, a coagulation profile was done, which was within normal limits. Additionally, the patient had no previous history of TEs and was well-adherent to the gluten-free diet, adding to our postoperative protocol with extra precautions as mentioned previously. All of this played a crucial role in balancing risks and benefits in this case. Although alternative options for breast reconstruction were discussed with the patient, her history of multiple pregnancies and abdomen condition made her make an informed decision to undergo microsurgical breast reconstruction utilizing a DIEAP flap.

In the hands of the senior author, who had over 10 years of experience performing more than 500 microvascular breast reconstruction procedures, including some quite challenging cases,[9,10] this case marked the first encounter of a patient with celiac disease to undergo a free flap reconstruction. As a result, the patient expressed satisfaction with the outcome, and the procedure went smoothly without any untoward complications.

CONCLUSIONS

In conclusion, despite the suggested theories in the literature regarding the risk of thrombosis in cases of CD, none have provided detailed insights into how it can impact the outcomes of microsurgical breast reconstruction. This case report is the first to address this aspect, and as a result, it demonstrates that the DIEAP flap is a viable option in such cases.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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