Late Bleed after Deep Inferior Epigastric Perforator Flap Breast Reconstruction

Rachel E. Pferdehirt, MD*  
Maurice Y. Nahabedian, MD*†

**Summary:** Late bleed following deep inferior epigastric perforator (DIEP) flap breast reconstruction is an uncommon event. In this case report, the authors describe a case of late bleed 7 months following the index operation. This occurred in the setting of strenuous exercise. No specific etiology was determined and the condition resolved without treatment.  
(Plast Reconstr Surg Glob Open 2020;8:e3035; doi: 10.1097/GOX.0000000000003035; Published online 19 August 2020.)

Bleeding complications following autologous breast reconstruction are uncommon, with an incidence ranging from 3% to 6%. Most of these bleeding events occur during the early postoperative period. Late bleeding can also occur, although is exceedingly rare. Several reports have previously described late bleed, but these bleeds are typically found to occur at the donor site and are usually without a clear underlying etiology. The purpose of this case study is to describe a patient who demonstrated late bleeding at the recipient site following deep inferior epigastric perforator (DIEP) flap breast reconstruction.

**CASE REPORT**

A 57-year-old woman with right breast cancer was initially evaluated for mastectomy and reconstruction. She denied any history of bleeding, coagulopathy, or medication use that could increase the risk of bleeding. Following sentinel lymph node biopsy and unilateral nipple-sparing mastectomy, immediate reconstruction with a DIEP flap was performed. The operation was uneventful. The flap was anchored to the lateral and medial chest wall using absorbable monofilament sutures. However, 1 hour postoperatively, a hematoma was noted in the right breast, requiring operative exploration and hemostasis. The source of bleeding was noted to be from the right axilla. The remainder of her postoperative course was otherwise uncomplicated, and she demonstrated normal healing.

Approximately 7 months following the reconstruction, the patient presented to office with new-onset ecchymosis and swelling of the right reconstructed breast. She stated that this ensued following strenuous physical exercise. She denied any history of trauma or intake of dietary supplements that may increase the risk of bleeding. Physical examination demonstrated mild ecchymosis and petechiae surrounding the breast mound extending toward the sternum (Fig. 1). No fluid wave or superficial fluid collection was appreciated. A Doppler examination confirmed a strong arterial and venous signal within the flap. Computed tomographic (CT) angiogram was performed 2 days later, which demonstrated a patent arterial and venous anastomoses without any fluid collection or structural abnormalities of the flap. Ultrasound examination was performed 2 weeks later, and it demonstrated a 5.4 × 1.9 × 4.2 cm³ well-circumscribed inferolateral hypoechoic fluid collection located at the deep lateral aspect of the flap near the 8 o’clock position. No surgical intervention was performed, and the ecchymosis gradually resolved over a 7-week period. A follow-up ultrasound 7 months later demonstrated a resolving fluid collection measuring 3.2 × 1.1 × 1.5 cm³. Her hematocrit remained stable between 34 and 37, and her platelet count was 268. The source of the bleeding was never determined; however, the etiology was presumed to be strenuous exercise. Further workup to rule out liver disease, vitamin K deficiency, and other sources of bleeding were not performed.

**DISCUSSION**

Bleeding following autologous breast reconstruction can occur in the immediate or delayed phases. Known etiologies during the early postoperative period include anastomotic leak, an unclipped arterial or venous branch, or venous hypertension of the flap. The etiology of late bleed is less clear, but previous reports implicate excessive physical exertion or Valsalva-like maneuvers as the cause. Previously, a patient, who underwent removal of a left chest wall venous access mediport in conjunction with
a right oncoplastic reconstruction for cancer and a left reduction mammoplasty for symmetry, on postoperative day 8, after lifting a heavy bag of groceries, heard a “pop” in her left chest and noted immediate swelling of the right breast. Upon immediate evaluation, the left breast was found to be swollen and ecchymotic, prompting operative exploration, with findings consistent with late bleeding from the venous mediport site.

Late hematoma arising at the latissimus dorsi donor sites has also been described. Lineaweaver et al described swelling and bleeding at 21 months, following strenuous upper extremity exertion. Brooker et al described a series of 4 patients who developed late hematomas, all greater than 1 year following latissimus dorsi musculocutaneous flap breast reconstruction. Lee et al described 3 patients with organized late hematomas at the latissimus dorsi donor site, with no obvious etiology. In contrast to the report by Lineaweaver et al, the latter 2 studies were not able to identify an inciting event or clear etiology.

To best address the complication of delayed bleeding, it is important to understand the underlying physiology. Current imaging modalities may be useful in determining potential etiology. CT angiogram and duplex ultrasound are both useful modalities to confirm anastomotic patency; duplex ultrasound is particularly useful to evaluate for venous congestion, a rare but devastating cause of DIEP flap failure (1%–4%). Furthermore, magnetic resonance imaging can provide helpful information regarding fluid composition and site of bleed, easily differentiating between flap and native tissue planes. In the described case, delayed bleed presented not as hematoma but as ecchymosis and petechiae that were initially presumed secondary to intra-flap hemorrhage. It is unlikely that the late bleed was related to the initial postoperative bleed because the initial bleed was from the axilla, whereas there was no axillary ecchymosis and petechiae that were initially presumed secondary to intra-flap hemorrhage. It is unlikely that the late bleed was related to the initial postoperative bleed because the initial bleed was from the axilla, whereas there was no axillary ecchymosis with the late bleed. It is also unlikely that the flap sheared off the chest wall because the breast footprint remained stable. Although no fluid collection was noted following the initial CT angiogram, ultrasound examinations 2 weeks and 7 months later did demonstrate a deep and resolving fluid collection.

Previous reports of delayed bleed after prosthetic implant describe spontaneous presentation, with no history of trauma in up to 75% of cases. These cases are typically thought to be secondary to chronic inflammation or shear forces between the capsule and the native tissues. In the described case, however, it is likely that other factors contributed to the clinical findings. The possibility of microtraumas, resulting in microfracture of the soft tissues, may result in focal bleed from the suspected relatively weaker vasculature. The theory being that these microtraumas may be the result of blunt trauma or squeezing as it produces excessive friction on the tissues. It is possible that a similar mechanism of microvascular trauma within the flap itself may be the etiology of these findings, based on the assumption that a flap would be expected to have relatively weak neovasculature as compared with the established vasculature of the surrounding tissues. In addition, given the known tenuous state of the venous outflow in new DIEP flaps, it may be that any additional compromise would not be well tolerated by the flap. Increased venous congestion, whether due to trauma or compromised venous outflow, may increase hydrostatic pressures experienced by the capillary systems, resulting in extravasation or focal capillary rupture. This microvascular trauma would be expected to present as either ecchymosis or petechiae, primarily confined to the DIEP flap tissue, as was observed in the described case.

Maurice Y. Nahabedian, MD
Virginia Commonwealth University—Inova Branch
National Center for Plastic Surgery
7601 Lewinsville Dr., #400
McLean, VA 22102
E-mail: DrNahabedian@aol.com

ACKNOWLEDGMENT
This case report is exempt from IRB review according to the standards delineated in the Helsinki Declaration.

REFERENCES
1. Thorarinsonn A, Fröjd V, Kölbl Y, et al. A retrospective review of the incidence of various complications in different delayed breast reconstruction methods. Plast Reconstr Surg. 2016;137:25–34.
2. Fleury C, Krishnan NM, Han KD, et al. Late hematoma following central venous port removal. Plast Reconstr Surg. 2017;139:814–815.
3. Lineaweaver WC, Buncke GM, Buncke HJ. Hematoma in a latissimus dorsi donor site 21 months after surgery. Ann Plast Surg. 1988;21:143–144.
4. Brooker JE, Wong KY, Malata CM. Spontaneous late haematomas at latissimus dorsi flap donor sites: an unusual complication of breast reconstruction. Plast Reconstr Aesthet Surg. 2015;68:e40–e42.
5. Lee JS, Jeon HJ, Lee J, et al. Treatment of late solidified hematoma in back donor site after breast reconstruction with latissimus dorsi flap: report of three cases. BMC Surg. 2019;19:51.
6. Hedegard W, Niell B, Specht M, et al. Breast reconstruction with a deep inferior epigastric perforator flap: imaging appearances of the normal flap and common complications. AJR Am J Roentgenol. 2013;200:W75–W84.
7. Cheng NX, Chen B, Li Q, et al. Late haematoma and seroma in patients with silicone mammary prosthesis: our reports and literature review. J Plast Reconstr Aesthet Surg. 2011;64:e185–e186.
8. van Rijssen AL, Wilmink H, van Wingerden JJ, et al. Amorous squeezing of the augmented breast may result in late capsular hematoma formation: a report of two cases (and a review of English-language literature on late hematoma formation in the augmented breast). Ann Plast Surg. 2008;60:375–378.