

## Review Article

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# Latissimus dorsi flap for breast reconstruction

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## ABSTRACT

The latissimus dorsi flap (LDF) is a reliable and time-tested autologous option for breast reconstruction following mastectomy or breast-conserving surgery. It can be harvested as a myocutaneous or muscle-only flap, with or without fat grafting or implant placement, allowing tailored reconstruction based on patient anatomy, comorbidities, and aesthetic goals. The LDF is especially advantageous in patients who are not suitable candidates for abdominal-based free flaps or who present with compromised local tissues after radiation or failed reconstruction. Recent refinements, such as immediate fat augmentation and muscle-sparing techniques, have expanded its reconstructive versatility and improved donor-site outcomes. The most common complications are donor-site related, with seroma formation being the predominant issue, reported in up to 40% of cases. Other complications include hematoma, wound dehiscence, infection, and partial flap necrosis, though total flap loss is rare. Functional morbidity, particularly mild shoulder weakness or limited range of motion, may occur but generally has minimal impact on daily activities. Techniques preserving the thoracodorsal nerve and minimizing muscle harvest significantly reduce postoperative morbidity. Overall, the LDF provides consistent aesthetic and functional results, making it a valuable and versatile reconstructive option. Its safety, reliability, and adaptability—particularly when integrated with fat grafting—ensure its continued role in contemporary breast reconstruction.

**Keywords:** Latissimus dorsi flap, Breast reconstruction, Donor-site morbidity, Seroma, Shoulder function, Fat grafting, Muscle-sparing technique, Reconstructive surgery

## INTRODUCTION

The latissimus dorsi flap (LDF) is a well-established autologous option for breast reconstruction, utilized in both immediate and delayed settings following mastectomy or breast-conserving surgery. The flap can be harvested as either a myocutaneous or muscle-only flap, with or without adjunctive fat grafting or implant placement, depending on the reconstructive requirements and patient-specific factors.<sup>1-8</sup>

LDF is particularly valuable in patients who are not candidates for abdominal-based free flaps (e.g., due to insufficient abdominal tissue, prior abdominal surgery, or comorbidities precluding microsurgery) and in those with poor local tissue quality, such as post-radiation or failed implant-based reconstruction.<sup>1,3,5,8</sup> The technique is

reliable, with consistently low rates of major complications and flap loss, and is associated with high patient satisfaction and favorable aesthetic outcomes.<sup>2-8</sup>

The flap may be used for: Total breast reconstruction, either as a stand-alone autologous procedure or in combination with an implant or tissue expander to achieve adequate volume.<sup>2,3,5-8</sup> Partial breast reconstruction to address defects following breast-conserving therapy, especially in low-volume, nonptotic breasts.<sup>9</sup> Salvage reconstruction after failed implant or free flap procedures.<sup>3,8</sup>

Technical modifications, such as immediate fat grafting (fat-augmented LDF), have been developed to overcome the inherent volume limitations of the latissimus dorsi muscle and improve contour and softness, further

enhancing aesthetic results and patient satisfaction.<sup>1,7</sup> The choice between muscle-only and myocutaneous flaps may be guided by the need for skin supplementation and donor site considerations, with muscle-only flaps offering shorter operative times and improved donor site satisfaction when skin replacement is not required.<sup>4,7,8</sup>

Common complications include seroma formation at the donor site, wound dehiscence, and, less frequently, partial flap necrosis; however, serious adverse events and total flap loss are rare.<sup>5</sup> Functional outcomes are generally excellent, with minimal long-term impairment of arm or back function.<sup>6</sup>

## COMPLICATIONS

The LDF procedure is associated with several well-characterized complications, which can be categorized as donor-site, flap-related, and functional morbidities.

Donor-site complications are common and include seroma formation, which is consistently reported as the most frequent issue, with rates ranging from approximately 26% to over 40% depending on patient population and flap technique.<sup>9,10</sup> Seromas often require aspiration or drainage, typically at the donor site. Hematoma is less common but still notable, with rates around 2-10% and a higher incidence compared to other flap types in head and neck reconstruction.<sup>11,13</sup> Wound dehiscence and surgical site infection occur in 7-8% of cases, and partial skin or nipple necrosis is seen in about 7% of patients.<sup>11</sup> Poor wound healing is also reported, with an incidence of 8.6% in head and neck reconstruction.<sup>14</sup> Flap loss due to necrosis is rare, occurring in approximately 2% of cases.<sup>15</sup>

Functional donor-site morbidity primarily involves shoulder dysfunction. Quantitative studies demonstrate a significant reduction in shoulder adduction and extension strength (17-21% loss at 12 months), although range of motion and ability to perform activities of daily living are generally preserved.<sup>16</sup> Subjective discomfort at the donor site is reported by up to 41% of patients, with most experiencing minimal impact on daily activities but greater difficulty with sports or artistic activities.<sup>17</sup> The degree of functional impairment is influenced by the extent of muscle harvested and whether the thoracodorsal nerve is preserved; muscle-sparing and nerve-preserving techniques are associated with lower morbidity.<sup>15</sup> Sensory disturbances at the donor site are also common and may increase over time.<sup>16</sup>

Other complications include hematoma/seroma at the donor site, which is more prevalent with LDFs compared to anterolateral thigh flaps.<sup>17</sup> The risk of complications such as seroma and prolonged drainage is higher with larger flap sizes and in breast reconstruction settings.<sup>2</sup> Patient factors such as obesity, smoking, and prior radiation do not appear to significantly increase donor-

site complication rates, although obese patients may have a higher risk of mastectomy skin flap necrosis.<sup>18</sup>

In summary, the most frequent complications of the LDF procedure are donor-site seroma, hematoma, wound dehiscence, infection, partial necrosis, and functional shoulder impairment, with the severity and incidence influenced by surgical technique and patient factors.<sup>18</sup>

## CONCLUSION

The LDF remains a dependable and versatile option for breast reconstruction, offering predictable outcomes, high flap survival, and broad applicability across a range of reconstructive scenarios. Its reliability, even in patients with prior radiation, comorbidities, or failed previous reconstructions, underscores its enduring relevance in modern reconstructive surgery. Technical refinements—such as fat-augmented and muscle-sparing variations—have further improved both aesthetic outcomes and donor-site morbidity, making the procedure more adaptable to individual patient needs.

While donor-site complications, particularly seroma formation, remain the most frequent issue, these are typically minor and manageable with appropriate drainage and postoperative care. Functional morbidity, primarily related to shoulder strength and range of motion, is generally mild and well tolerated, especially when nerve-preserving and limited-harvest techniques are employed. Serious complications such as flap loss or significant disability are uncommon.

In conclusion, the latissimus dorsi flap continues to serve as a cornerstone in autologous breast reconstruction. Its balance of safety, versatility, and aesthetic potential—particularly when combined with modern adjuncts like fat grafting—makes it an invaluable option for both primary and salvage reconstruction, with excellent long-term functional and cosmetic results.

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