

Breast Reconstruction and its Impact on Movement Considerations for Physiotherapy Management

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ABSTRACT

Breast reconstruction after mastectomy is an important part of comprehensive breast cancer care, improving psychosocial well-being and quality of life. However, it may cause movement limitations and functional impairment, especially in the upper limb and, in autologous procedures, at the donor site. Common issues include reduced shoulder mobility, muscle weakness, pain, and altered movement patterns. Implant-based reconstruction is often linked to pectoral tightness, while autologous techniques may cause additional donor site deficits. Individualized physiotherapy plays a key role in improving recovery and function.

METHODS

A narrative literature review was conducted to examine the effects of breast reconstruction on movement and functional outcomes, and the implications for physiotherapy. Articles published between 2000 and 2025 were included. Peer-reviewed studies formed the primary evidence base, providing detailed analyses of surgical techniques, biomechanical consequences, and expected rehabilitation outcomes. Systematic reviews and meta-analyses were used to identify prevailing trends in clinical practice and summarize existing evidence.

CONCLUSION

Breast reconstruction after mastectomy is frequently associated with movement and functional impairments. The extent of dysfunction depends on the reconstruction technique, emphasizing the need for targeted rehabilitation. Evidence supports structured, progressive physiotherapy to improve mobility, strength, and function. Physiotherapists must understand the biomechanical effects of different methods to provide safe, individualized care.

RESULTS

Upper quarter dysfunction is common following all types of breast reconstruction, manifesting as shoulder pain, reduced range of motion, muscle weakness, scapular dyskinesia, and compensatory movement patterns. Chest muscle tightness may persist for up to six months, lymphedema for up to one year, and rotator cuff impairments are frequently reported in the postoperative period.

Implant-based reconstruction is associated with pectoralis major tightness, reduced torque muscle strength, and altered shoulder muscle activation patterns (4). Submuscular implant placement frequently leads to postoperative pain and muscle spasms, promoting protective movement behaviours that further compound shoulder dysfunction and increase the risk of scar tissue formation (3).

Abdominal-based reconstruction introduces donor site morbidity that affects trunk function. TRAM flap procedures significantly reduce abdominal and back extensor strength and are associated with higher postoperative pain and greater functional impairment compared to other techniques (11). The DIEP flap preserves the rectus abdominis muscle and is associated with lower donor-site morbidity; however, some degree of abdominal weakness may still persist (6). Both techniques may compromise posture and core stability.

Following implant-based reconstruction, rehabilitation focuses on pectoralis major relaxation and re-training, gradual correction of compensatory movement patterns, and progressive strengthening of the rotator cuff and scapular stabilizers (10). After LAT flap reconstruction rehabilitation emphasizes strengthening of scapular stabilizers, correction of scapular dyskinesia, activation of latissimus dorsi synergists, and targeted postural exercises to reduce the risk of thoracolumbar scoliosis. For abdominal-based reconstructions, rehabilitation must additionally address trunk and core muscle deficits; preoperative physiotherapy focusing on rectus abdominis strength may also contribute to improved postoperative recovery following DIEP flap procedures (2). Adjuvant therapies such as massage therapy and pulsed electromagnetic field therapy may reduce postoperative pain, inflammation, and anxiety and therefore facilitate earlier participation in active rehabilitation (5).

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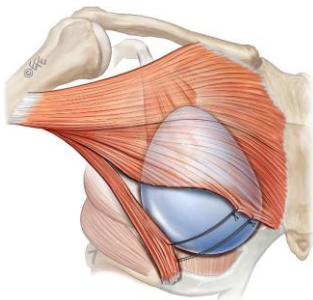


Figure 1. Implant-based reconstruction.

Latissimus dorsi (LAT) flap reconstruction results in significant and potentially long-lasting deficits in shoulder adduction, internal rotation, and extension strength which may persist for up to 3.5 years postoperatively (12). Up to 73% of patients report difficulty with arm-related activities of daily living. Shoulder instability is also commonly reported (7). Residual impairments more prominently affect high-demand and athletic activities than routine functional tasks (1). Functional morbidity tends to adequately improve over time with appropriate rehabilitation.

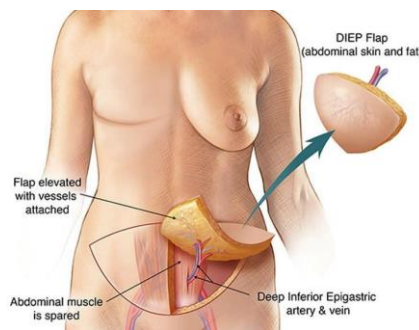


Figure 3. Abdominal-based reconstruction (DIEP flap).

Physiotherapy plays a critical role in recovery across all reconstruction types. In the immediate postoperative period, gentle shoulder extension and adduction exercises are encouraged within pain tolerance, with elevation typically limited to 90° during the first two weeks (8). Between weeks two and four, full range of motion is gradually restored as wound healing progresses. Progressive strengthening is introduced at approximately one month, with return to sport and higher-load activities encouraged after three months. A Cochrane systematic review confirmed that structured postoperative exercise programs are significantly more effective than standard care alone in improving shoulder mobility in both the short and long term (9).

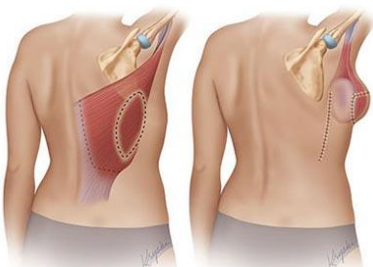


Figure 2. Latissimus dorsi (LAT) flap.