

Forehead Flaps and Serratus Anterior Muscle in Arm Reconstruction

Kaoutar Grimaud*

Department of Surgery, Charité University Hospital, Berlin, Germany

Corresponding author: Kaoutar Grimaud, Department of Surgery, Charité University Hospital, Berlin, Germany, E-mail: grimaud_k@gmail.com

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Description

Arm reconstruction, especially after traumatic injury, surgical resection or congenital defects, is one of the most challenging and multidisciplinary areas in plastic and reconstructive surgery. Restoring both the functional and aesthetic appearance of the arm requires careful consideration of available tissue for reconstructive options. Among the most important surgical techniques for arm reconstruction are the use of forehead flaps and the serratus anterior muscle, both of which have unique advantages depending on the extent of tissue loss, the location of the defect and the functional needs of the patient.

In arm reconstruction, the serratus anterior muscle is often used for covering large, complex defects, such as those resulting from traumatic injuries, burns or tumor resections. The myocutaneous flap can be transposed or rotated into the defect area, providing both functional and aesthetic restoration. When combined with a skin paddle, the flap can provide sufficient soft tissue coverage, restoring the natural appearance of the arm.

Forehead flaps in arm reconstruction

The use of forehead flaps, typically associated with facial reconstruction, has become a viable option in cases of extensive tissue loss, particularly when other reconstructive options are unavailable or unsuitable. The forehead flap is a versatile, pedicled flap that is well-suited for covering defects on the arm, especially when soft tissue coverage is required over large areas. The forehead, being rich in skin and subcutaneous fat, offers a reliable source of tissue that can be utilized effectively for arm reconstruction. The forehead flap has several advantages, making it an ideal choice for arm reconstruction. One of the key benefits is the robust blood supply from the supratrochlear artery, which nourishes the forehead flap. This reliable vascularity ensures good healing potential and decreases the risk of flap necrosis. The forehead skin also shares similar properties to the skin on the arm, including texture and elasticity, which contributes to an aesthetically pleasing result.

Another advantage of the forehead flap is its flexibility in size and shape. Surgeons can customize the flap to fit a variety of defects, even large and irregularly shaped ones. Its versatile design allows for the reconstruction of both the skin and soft tissues, ensuring that the arm is restored to a functional and natural appearance. In cases where a larger flap is needed, the forehead flap can be extended to include portions of the scalp, providing additional tissue for larger defects. Additionally, the forehead flap

can be easily rotated or advanced into position, making it adaptable for a variety of defect locations. The surgical technique for harvesting the forehead flap typically begins with careful planning and marking of the flap, ensuring that it can cover the defect while maintaining sufficient blood supply. The flap is elevated with a pedicle, preserving the supratrochlear artery and rotated or transposed into the defect area. For arm reconstruction, the forehead flap can be used to cover soft tissue loss resulting from traumatic injury, tumor resection or congenital deformities. Once the flap has been transposed to the defect site, the donor site on the forehead is closed and the flap is monitored for signs of adequate perfusion. After a period of time, usually around 2 to 3 weeks, the flap can be separated from its pedicle and sutured into place to complete the reconstruction.

Serratus anterior muscle in arm reconstruction

The serratus anterior muscle, a need part of the musculoskeletal system in the chest, is increasingly being utilized in arm reconstruction due to its ability to provide both vascularized muscle and overlying skin for soft tissue coverage. The serratus anterior muscle is typically harvested as a myocutaneous flap, providing both functional muscle for repair and skin for coverage. The primary advantage of using the serratus anterior muscle in arm reconstruction is its rich blood supply, which comes from the long thoracic artery. This vascularization ensures the survival of the muscle and skin when harvested as a myocutaneous flap. The muscle itself is broad, thin and easily accessible, making it an excellent option for coverage of large defects on the arm.

The muscle's position and versatility allow it to be used in a variety of locations. For instance, it is often used for reconstructing the forearm or upper arm after extensive tissue loss. The serratus anterior muscle can be harvested in combination with a skin paddle, allowing for coverage of both soft tissue defects and muscle deficits. In cases of nerve injury or muscle weakness, the muscle can also be used to restore function to the arm, particularly in restoring shoulder stability or improving mobility. Another advantage of the serratus anterior muscle flap is its relatively low donor site morbidity. The muscle is not critical to the overall function of the shoulder girdle, meaning that its loss does not result in significant impairment of arm or shoulder function. Furthermore, the donor site can be closed without the need for complex reconstructive techniques, minimizing the impact on the patient's recovery.