

Rehabilitation of Contracted Axilla is Hard for Reconstructive Surgeons

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Description

This difficulty arises from severe joint stiffness, splinting difficulty, and multiple recurrence rates with insufficient care. The anterior and posterior folds of the axilla stretched during full shoulder joint abduction, which requires good cutaneous gliding capacity at the shoulder joint area. The lateral aspect trunk skin also moves upwards. Management of these contractures at the axilla must regain these possibilities of gliding.

The surgical procedure chosen for axillary defect reconstruction can be made according to surrounding skin conditions and the defect size. The flaps have a superior choice over the skin graft due to their superior functional and aesthetic results. Many flaps have been described for axillary reconstruction, including local, regional, and free flaps, either in the form of a musculocutaneous flap, Limberg flap, or fasciocutaneous V-Y flap. The defects resulting from excision of grade 3 axillary hidradenitis suppurativa reported superior results when reconstructed by perforator flaps, such as the thoracodorsal artery perforator (TDAP) flap. The design of the propeller flap looks like a fan with an unequal length of its 2 blades, its pivot point formed by the perforator, the long arm when the blades are switched comfortably fills in the defect. It is a local island fasciocutaneous flap based on a single dissected perforator.

Inclusion Criteria

Patients with major axillary defects after wide local excision (1cm below the hairline) either due to chronic inflammation (hidradenitis suppurativa), trauma, or excision of burn scar causing contracture were included in this study. A case series study was performed on all consecutive patients suffering from axillary defects at the Plastic and Reconstructive Surgery Department at Beni-Suef University Hospital. All patients who underwent reconstruction of the axilla between February 2018 and August 2021 were identified from the hospital database.

Three distinct rows of perforator groups were well detected in the lateral thoracic region, at intervals parallel to the anterior border of the latissimus dorsi muscle. The first row is a longitudinal series of direct cutaneous perforators arising from the lateral thoracic vessels and is located on the serratus anterior muscle along the lateral border of the pectoralis major

muscles. The second row, about 2cm anterior to the latissimus dorsi muscle border, comprises septocutaneous (or direct cutaneous) perforators from the cutaneous branches of thoracodorsal vascular systems. The third row is composed of musculocutaneous perforators through the latissimus dorsi muscle, and its anterior group is located within 2cm of the anterior border of the latissimus dorsi muscle. This flap differs totally from the parascapular flap. The island fasciocutaneous flap can be raised on any perforator at the lateral thoracic region from the 3 rows mentioned above, so it has no constant anatomy. However, the parascapular flap is pedicled, has constant anatomy based on the circumflex scapular artery. Our flap can be raised on any perforator from these rows close to the defect.

Operative Details

All patients received general anesthesia, positioned laterally on either right or left lateral position, operated with the arm fully abducted 180° between the upper limb and trunk. Intravenous antibiotic was received immediately pre-operatively. The size of the flap was adjusted according to the size of the defect ranged from 8x10cm in the smallest flap up to 13x 18cm in the largest flap and the position of the discovered perforator. The flap designed in an elliptical fashion sharing one edge with the defect and the perforator should be located at the upper 1/3 of the flap. After incising the flap edges, subfascial dissection of the flap using loupe magnification (2.5 X) was used to identify the best perforators around the defect. The best one was chosen based on pulsatility, caliber, orientation, number, and caliber of accompanying veins and course. The large perforator seen intraoperatively during dissection is the one that heard with the best pulse before surgery in 18 cases by doppler except for 3 cases that we used duplex US to detect the perforators.

Reconstruction of axilla by perforator-based propeller flaps had become challenging. The axilla is surrounded by multiple perforators that can undergo a wide rotation and mobilization due to its reliable vascular pedicle and without sacrificing major trunk vessels. Flap harvesting is rapid, and there is no need for microsurgery to prevent complications. It is essential to select patients accurately, planning pre-operatively with good meticulous dissection. Propeller flaps proved to be effective regarding the viability of the flap, a suitable cover of various

defects, and decreasing the donor site defect with overall satisfactory aesthetic, functional outcomes, and patient satisfaction.

The patient was placed in a normal room temperature (37c) with good hydration, including IV fluids (20-30ml/kg/day, Ringer Lactate) and good oral intake. The arm was abducted 70 degrees. Early post-operative monitoring of the flap was performed. IV antibiotics (Amoxycillin Clavulanic acid 1gm/12h) were continued for at least 5 days post-operatively. Anti-thromboembolic prophylaxis (enoxaparin 40mg. SC once/day) was given during the period of recumbency. Any sources of flap compression were avoided. Drains at the donor site were to be removed usually on the 5th day. Sutures were removed on the 15th day, then anti-scar creams were applied for 3 months. Normal daily activities were started after 3 weeks. Physiotherapy was started after 3 weeks.

Considering donor site closure, all donor sites in our study closed primarily, even with the largest defect, which was 18*13cm. These results agreed with the study done by Mahfouz, disagreed with Roswell et al., that used pedicled pectoralis major flaps and other myocutaneous flaps in reconstructing the axilla that left large donor site defects that required skin grafting that resulted in a bad aesthetic appearance. Balázs and his colleagues, in their study of axillary reconstruction by TDAPF, included 15 patients who reported a flap complication rate of 23.3% and venous congestion occurred in 25% with total flap loss in one patient (6.9%). However, in our study, eight patients had flap complications, one patient had complete flap loss (4.5%), four had partial or distal flap loss (18 %), two had venous congestion (9.1%).