

### Background of the Technique

In 1979, Lamberty [1] described the supraclavicular flap on the basis of illustrations taken from Toldt's anatomical atlas, which was published in 1903 [2]. The author showed a vessel which emerged between the sternomastoid and trapezius in the lower part of the posterior triangle and passed over the acromion. After that, Pallua et al. [3] reported in 1997 that they had used this flap successfully in eight cases of neck contracture reconstruction. Since then, the supraclavicular flap has been employed widely. Of the various flap techniques that are available, the supraclavicular flap is excellent in terms of its match with the color and texture of the recipient area and the simplicity of the operative procedure [4–12]. The author has also successfully applied this flap in the clinic in numerous cases.

The flaps that we employed clinically included not only conventional supraclavicular flaps but also tunnel island flaps, bilateral supraclavicular flaps, and supercharged flaps (Fig. 38.1).

### Anatomical Characteristics and Indication

1. Ninety percent of the supraclavicular artery can be found from the middle third of the clavicle (Type I) [13]. Ten percent of that can be found from the lateral third of the clavicle (Type II) [13].
2. The supraclavicular artery is usually derived from the transverse cervical artery [13]. Ninety five percent of the transverse cervical artery arises from the thyrocervical trunk and 5% from the subclavian artery [13].

3. On the body surface, the transverse cervical artery can be identified under the skin as being on average 3.77 cm (3–4.5 cm) from the sternoclavicle joint [13]. The external diameter of the transverse cervical artery is on average 2.9 mm, while the external diameter of the supraclavicular artery is on average 1.17 mm [13].
4. Supraclavicular is indicated for postburn scar contracture in neck, where a large and thin flap is required and also needs to be pliable and match the color for the reconstruction of contour-sensitive areas. Perforator supercharging can be employed if a much larger flap is needed (Fig. 38.1).

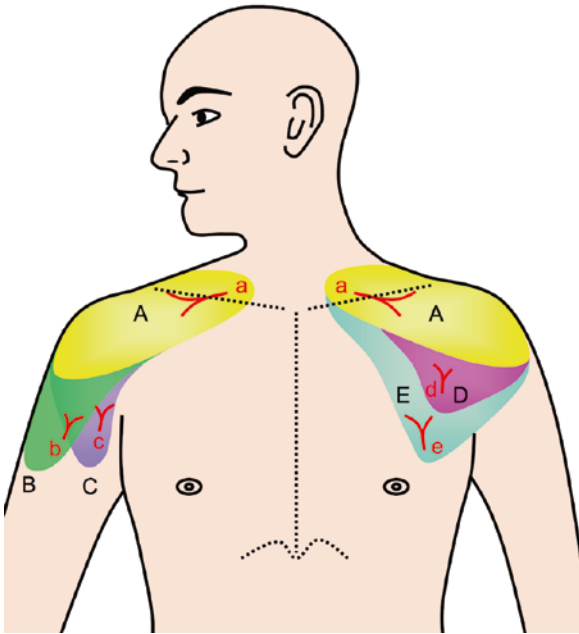
### Specific Skill of the Method

1. Flap size is determined according to the size of the recipient site and the flap is designed on the patient's shoulder (Fig. 38.2). We generally prefer fusiform designs as they allow the donor site to be closed primarily. The flap can be employed as a conventional rotation flap, tunneled flap, or supercharged flap, and the flap pedicle selected can be vascular or skin pedicle.
2. Landmarks of the flap should include anterior, posterior, and distal edges that reach the inferior border of the clavicle, the upper area of the trapezius muscle, and the upper arm, respectively. Doppler flowmetry, angiography, and MDCT are usually useful for identifying the supraclavicular artery preoperatively.
3. In the operation, recipient site scars are debrided to the depth of the deep fascia to release the contractures completely. The harvested flap includes skin, subcutaneous tissue, and the fascia of the deltoid muscle. In the medial part of the flap, the supraclavicular artery, which arises from the transverse cervical artery, can be identified. In some cases, we refine the transverse cervical artery and its bifurcation from the thyrocervical trunk to enable harvesting of an island flap with a longer pedicle.
4. The donor site can be closed primarily when the flap width is smaller than 10 cm. When the flap width exceeds 10 cm, split thickness skin grafts or bilobed flaps harvested from the dorsal region are needed.

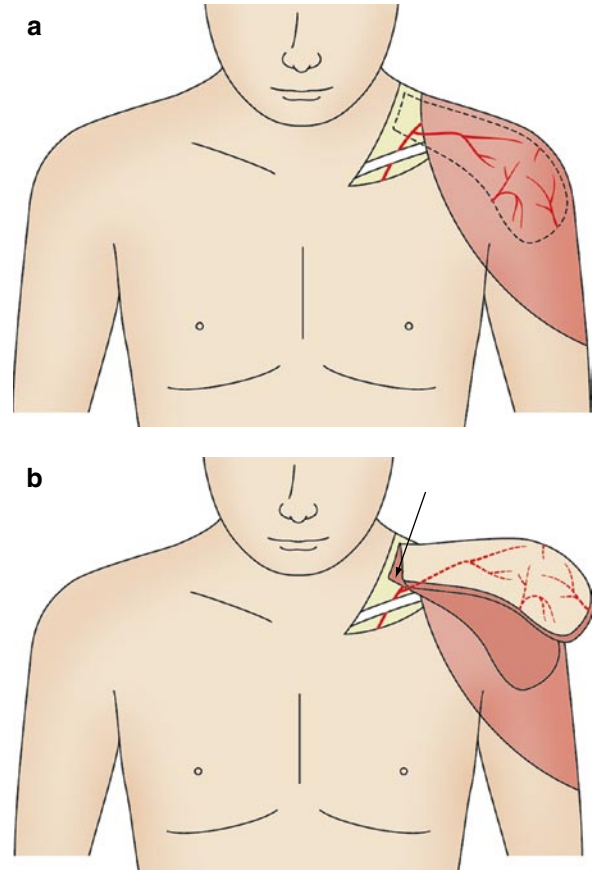
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**Fig. 38.1** Depiction of the supraclavicular flap and its supercharged versions. A: supraclavicular flap. A + B: supraclavicular flap supercharged with the posterior circumflex humeral vessel. A + C: supraclavicular flap supercharged with the anterior circumflex humeral vessel. A + D: supraclavicular flap supercharged with the thoracoacromial artery perforator (TAAP). A + E: supraclavicular flap supercharged with the lateral thoracic artery perforator (LTAP). *a*: supraclavicular artery. *b*: posterior circumflex humeral artery. *c*: anterior circumflex humeral artery. *d*: TAAP. *e*: LTAP. By using the supraclavicular flap displayed by A, it is possible to harvest flaps that are up to 11 cm wide and 21 cm long and whose anterior edges, posterior edges, and distal edges reach the inferior border of the clavicle, the upper area of the trapezius muscle, and the upper arm, respectively. Moreover, if the vessels indicated by *b–e* are used for supercharging, much larger flaps can be harvested



**Fig. 38.2** The schema of the supraclavicular flap. (a) The supraclavicular artery and the flap. (b) Flap elevation as an island flap. The *arrow* shows the point that refined the transverse cervical artery and its bifurcation of supraclavicular artery to harvest an island flap with longer pedicle

## Clinical Cases

### **+** Case 1 (Fig. 38.3)

A 42-year-old man suffered from severe scald burns on the neck and shoulder, but did not receive any treatment and subsequently developed contractures. The right shoulder had sufficient good healthy skin for neck reconstruction with a unilateral supraclavicular island flap that measured 25 × 15 cm. The flap was elevated as an island flap and was transferred to cover the defect after removing the scars. The flap survived completely. The neck movement of the patient recovered to the extent that he did not have any problems in daily life, although slight hypertrophic scars did develop on the flap margin. The donor site was closed by using a split thickness skin graft.



**Fig. 38.3** (a, b) Preoperative view. (c) Flap design (a 25 × 15-cm supraclavicular flap). (d) Flap elevation. (e) View immediately after the operation. (f, g) View 1 year after the operation

## **+** Case 2 (Fig. 38.4)

A 48-year-old female suffered from a flame burn and developed hypertrophic scars and scar contractures on the chin and neck a year after the wounds had healed. Since the patient has a history of diabetes, angiography was performed preoperatively to identify the supraclavicular artery. To reconstruct her neck, a unilateral supraclavicular island flap (25 × 14 cm) was planned. After removing the scars, the flap was elevated as an island flap. To increase the rotation arc of the vascular pedicle, the transverse cervical artery was ligated above its bifurcation with the supraclavicular artery, and a pivot point on the thyrocervical trunk was created. The flap was rotated 180° to cover the defect. The flap survived completely. The donor site was closed by using a split thickness skin graft. The texture and color matches of the flap were good and the patient was satisfied with the cosmetic and functional outcomes.



**Fig. 38.4** (a) Preoperative view. (b) Flap design (25 × 14 cm supraclavicular flap). (c) View immediately after the operation. (d, e) View 1 year after the operation