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# Flap update 2025: Part 2 lifting flaps

By Vixey Silva, DO, Mohammad Fardos, DO, and Kent Krach, MD, FAAD

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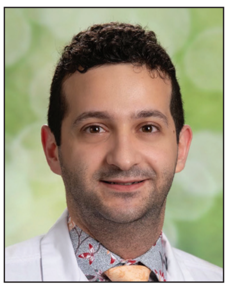

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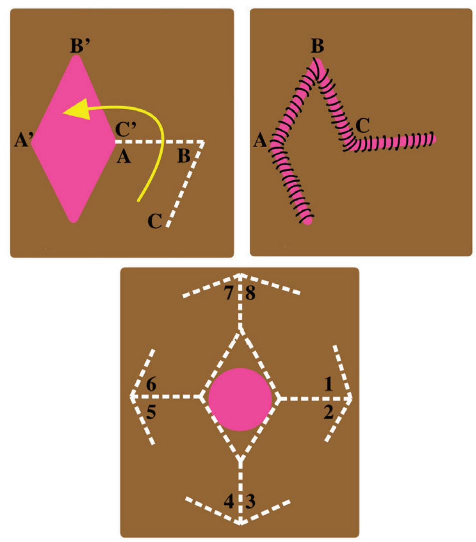
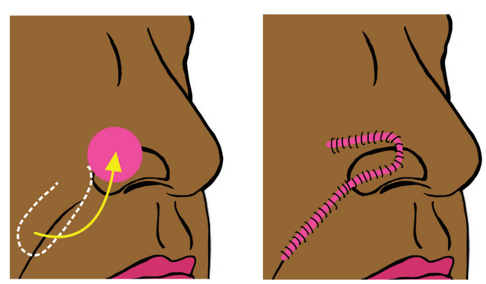
**Note:** The grouping of transposition and interpolation flaps in this section (part 2) reflects their shared primary movement of lifting tissue over intervening skin to reach the defect.

### Transposition flap

Key Features

- **Primary movement:** Lifting and transposing tissue from a non-adjacent site over intervening skin to close a primary defect. Combines pivotal and rotational motion to redirect closure vectors.
- **Tension vector:** Primary tension is redirected to the donor site.
- **Considerations:** (1) Useful in areas with minimal local laxity; borrows tissue from a nearby, laxer site. (2) Requires wide undermining. (3) Flaps rely on the subcutaneous and dermal vascular plexus for survival. (4) Can lead to pincushioning (trapdoor effect) or scar lines not aligned within relaxed skin tension lines.

| Type | Description | Image |
|---|---|---|
| Rhombic flap (Limberg flap) | **Design**: Based on a rhomboid defect with 60° and 120° angles. The flap can be oriented from any corner (eight configurations). Final closure often resembles a question mark.<br><br>**Locations**: Medial and lateral canthi, proximal nose, nasal sidewall, lateral forehead, temple, cheek, perioral region, chin, and dorsal hand.<br><br>**Considerations**: (1) The secondary defect should be closed first to anchor and guide flap inset. (2) Flap rotation should remain under 90° to reduce the risk of vascular compromise at the flap tip. (3) Requires wide undermining.<br><br>**Disadvantages**: Trapdoor defect.<br><br>**Modifications**: (1) The **Dufourmentel** flap narrows the tip angle of the secondary defect and reduces the arc of rotation for improved tension distribution. (2) The **Webster** flap further decreases the tip angle to 30°. Both designs help share tension between the primary and secondary defects and reduce distal tip ischemia. |   |
| Banner transposition | **Design**: A finger-shaped flap is drawn with a width equal to the primary defect and a length equal to the distance from the pivot point to the distal edge of the defect. The flap is then transposed and rotated into the defect.<br><br>**Locations**: Nasal ala, glabella, superior helix, concha, tragus, or crus of the ear.<br><br>**Considerations**: (1) Avoid narrow, elongated flaps exceeding a 3:1 length-to-width ratio to reduce tip ischemia. (2) In nasolabial transpositions, anchor the flap to the nasal sidewall periosteum and place a deep tack suture beneath the pivot point to maintain nasal ala concavity and structural support.<br><br>**Disadvantages**: Donor cheek site may exhibit trapdoor deformity. Can cause blunting of the alar groove. |  |

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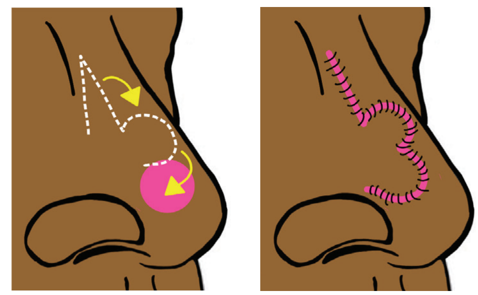
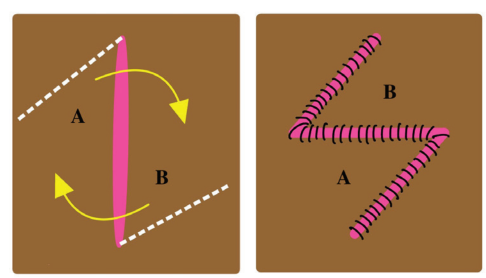
| Type | Description | Image |
|---|---|---|
| Bilobed (Zitelli modification) | **Design:** Two lobes are planned from the defect apex. The first lobe matches the defect width and rotates 45-50° from the defect axis; the second rotates a further 45-50° from the pivot point (total arc ~90°). Both are transposed to fill the defect, with closure resembling the "top of a heart." Additional lobes (e.g., trilobed) can extend the arc of the rotation beyond 90°.<br><br>**Locations:** Distal nose, cheek, helix, posterior ear.<br><br>**Considerations:** (1) Closure sequence: tertiary (second lobe donor site) → secondary → primary defect. (2) When used on the nose, undermine in a submuscular plane down to the periosteum.<br><br>**Disadvantages**: Prone to pincushioning secondary to lymphedema, flap oversizing, peripheral contraction, excess subcutaneous fat, or failure to maintain contact between the flap base and the recipient bed. |  |
| Z-plasty | **Design**: A transposition flap formed by creating a Z-shaped incision. The central limb of the "Z" lies along the scar. Two triangular flaps are created at equal angles on either end of the scar and then transposed, reorienting and lengthening the scar.<br><br>**Locations**: Medial canthus, helix; useful for functional and cosmetic revision of contracted or poorly aligned scars. Especially effective for releasing scar contractures near free margins.<br><br>**Considerations**: (1) Creates a zigzag pattern that helps camouflage linear scars. (2) Most commonly used technique to correct canthal tenting. (3) Scar lengthening depends on angle between limbs:<br>• 30° → 25% increase in length, ~40° tissue reorientation<br>• 45° → 50% increase in length, ~65° reorientation<br>• 60° → 75% increase in length, ~90° reorientation |  |

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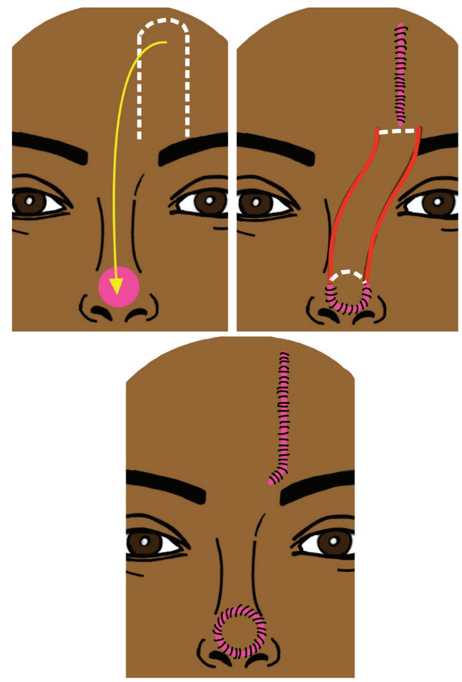
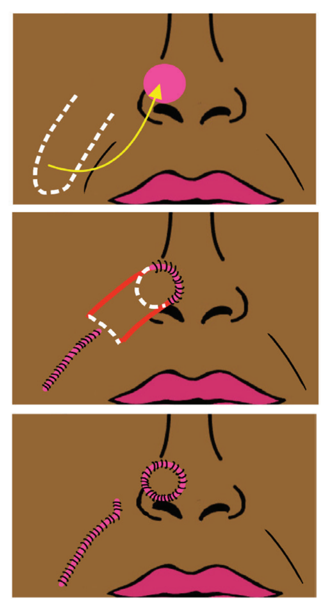
**Interpolation flap**

**Key features**

- **Primary movement:** Two-stage reconstructive technique that lifts and transfers non-adjacent tissue over intervening intact skin using pivotal and rotational motion.
- **Tension vector**: Primary tension is redirected to the donor site.
- **Considerations**: (1) Retains a thick vascular pedicle, allowing safe coverage of large, distal defects with a favorable length-to-width ratio. (2) Ideal for nasal subunits (e.g., ala, tip) when local tissue is insufficient. (3) Pedicles are typically divided after ~3 weeks.

| Type | Description | Image |
|---|---|---|
| Paramedian forehead flap | **Design**: Axial flap based on the supratrochlear artery if taken medially, or the supraorbital artery if taken laterally — both stem from the ophthalmic artery, which directly branches off the internal carotid artery. Arteries are found between the frontalis and the corrugator musculature in the subgaleal plane near the medial brow. Ideal pedicle width: 1.0-1.5 cm. The pedicle remains attached for ~3 weeks before division.<br><br>**Location:** Nasal tip (commonly used for nasal reconstruction).<br><br>**Considerations:** (1) Flap reach is determined by the distance from the orbital rim to the anterior hairline. (2) Results in a vertical forehead scar. The donor site may be closed primarily or left to heal by secondary intention. (3) The pedicle is typically placed contralateral to the defect to optimize arc of rotation.<br><br>**Disadvantages**: Can result in nasal tip hair growth if the donor flap extends into the hairline. |  |
| Nasolabial interpolation flap | **Design:** Relies on random blood supply from the dermal-subdermal plexus. A finger-shaped flap is harvested from the melolabial fold and tunneled or bridged across intervening skin to reach the primary defect. The pedicle remains attached for ~3 weeks before division.<br><br>**Location:** Distal nose, nasal ala, and medial alar rim.<br><br>**Considerations:** (1) Preserves alar groove and avoids blunting of nose-lip-cheek junction. (2) Flap should be oversized initially to compensate for contraction during healing. (3) During division, aggressively thin flap to better match nasal contour. (4) While this relies on tributaries from the angular artery, this artery itself is not contained within the flap. |  |

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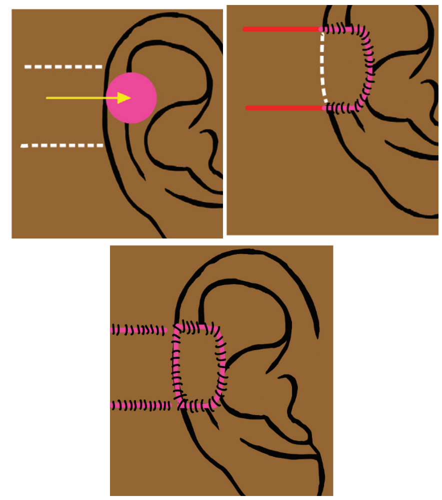
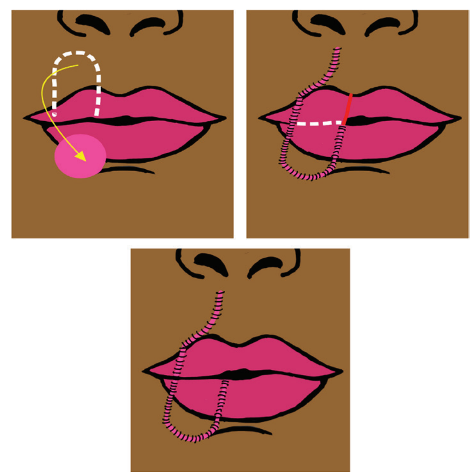
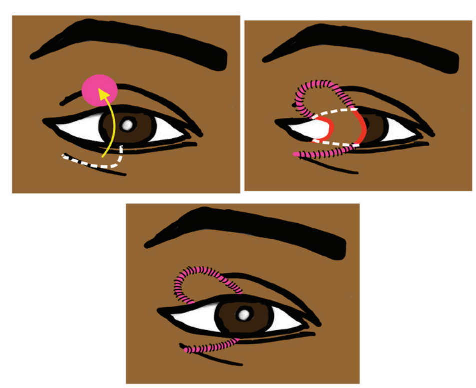
| Type | Description | Image |
|---|---|---|
| Retroauricular flap | **Design:** Random pattern interpolated flap from retroauricular skin/subcutaneous tissue, centered on the retroauricular groove. Main blood supply: auricular branch of posterior auricular artery. The pedicle remains attached for ~3 weeks before division.<br><br>**Location**: Medium-to-large anterior auricular defects (helical rim >2 cm, antihelix, conchal bowl, tragus, or external auditory canal).<br><br>**Considerations:** (1) Scars are well hidden in the retroauricular sulcus; absorbable sutures preferred. (2) Minimal undermining enhances mobility while preserving vascularity and reducing pincushioning. |  |
| Abbe cross (lip switch) | **Design:** A labial artery-based, full-thickness pedicle flap. The flap width should be 50-75% of the defect width to accommodate tissue recoil. It is rotated 180° into the defect and inset in layers, with the pedicle left attached for ~3 weeks before division.<br><br>**Location:** Lip.<br><br>**Considerations:** (1) Ideal for restoring orbicularis oris continuity and preserving oral competence. (2) Requires layered closure: mucosa → muscle → subcutis → skin (3) meticulous approximation of the vermilion border is important.<br><br>**Disadvantages**: Temporarily limits opening of the mouth until pedicle division. |  |
| Switch flap (Mustardé) | **Design:** Full-thickness flap from the lower eyelid is transposed on a pedicle to reconstruct a large full-thickness defect in the upper eyelid. The pedicle remains attached for ~3 weeks before division.<br><br>**Location:** Upper eyelid.<br><br>**Considerations:** (1) Technically demanding, requiring precise alignment of the lid margin, tarsus, and conjunctiva to restore function and cosmesis.<br><br>**Disadvantages**: Temporarily occludes vision in the operated eye until pedicle division. |  |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