Superficial temporal artery (STA) flaps are often used for reconstruction of hair-bearing areas. However, primary closure of the donor site is not easy when a relatively large skin island is involved. In such cases, skin grafts are needed at the donor site, resulting in baldness. We applied the divided and sliding technique, which was originally used for the latissimus dorsi musculocutaneous flap for primary donor-site closure,1 and successfully minimized the area of baldness. This report documents our technique.

SURGICAL METHODS
A slender STA flap with 3 skin islands was designed according to preoperative Doppler sonography to trace the parietal branch of the STA (Fig. 1). The flap was dissected below the level of the superficial temporal vessels, elevated as 1 island flap first, and then divided into 3 parts by incising the skin and subcutaneous tissues to just above the temporoparietal fascia, allowing for mobility of skin islands. Preserving the temporoparietal fascia and not dissecting the perforators to the skin islands, the central and most distal skin islands are rotated through 180 degrees respectively, sutured into a shape matching the defect area, and remade into 1 flap (Fig. 2). The donor site of the flap was closed primarily (Fig. 3).

CASE REPORT
A 73-year-old man presented with an exposed cochlear implant and defect in overlying skin on the left postauricular region because of chronic infection, scarring, and contracture of soft tissue. We planned to remove the cochlear implant temporarily and reconstruct the defect with thick tissue to allow for future reinsertion of the implant.

After an otolaryngologist removed the implant, the soft tissue defect measured 23 × 15 mm in the postauricular region. A slender 10- × 45-mm STA flap with 3 skin islands was designed based on the preoperative Doppler sonography to trace the parietal branch of the STA (Fig. 1). The flap was elevated as 1 island flap first and then divided into 3 by incising the skin and subcutaneous tissues, allowing for mobility of skin islands. Skin islands were slid, sutured into a shape matching the defect area, and remade into 1 flap (Fig. 2). The flap was then placed in the defect through a subcutaneous tunnel. The donor site of the flap was easily closed primarily (Fig. 3). Postoperative course was uneventful, and in the eighth month after the procedure, the cochlear implant was reinserted. The course after reinsertion was also favorable, and baldness from the procedure was minimized (Fig. 4).

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DISCUSSION

Hair-bearing scalp flaps based on STA have been used previously, particularly for resurfacing hair-bearing defects of the upper lip and eyebrows. Nevertheless, few case reports or short case series in the literature have investigated the role of these flaps in the reconstruction of scalp defects. The STA flap donor site is closed by skin grafting if the size of the flap is large, but baldness of the donor site can be unwelcome.

Çöloğlu et al. elevated the skin island in a bilobed fashion to decrease tension during primary closure of the donor site, but we have solved this issue by applying the divided and sliding flap technique for the STA flap, which enables primary closure and thereby avoids skin grafting to the donor site. The divided and sliding flap technique was first reported by Sawaizumi et al. in 1997. A large latissimus dorsi musculocutaneous flap was created from 2 semicircular skin paddles, and the 2 skin paddles were slid toward each other to cover the circular defect, enabling the primary closure of the donor site. After this, the divided and sliding technique was also used for anterolateral thigh and postauricular musculocutaneous flaps as well. We applied this technique to the hair-bearing flap where the primary donor site closure is extremely beneficial to prevent baldness consequent to skin grafting. In addition, although previous studies on the divided and sliding flap have reported that the flaps were slid after dividing them in 2, the present
method divides the flap into 3 because dividing and sliding an STA flap with 2 skin islands did not seem as appropriate, given the size of the defect. Even with this trichotomous division, the blood supply of the whole flap was maintained, and creation of a larger flap was possible.

In conclusion, the divided and sliding STA flap may at least partially solve the donor-site problem. Although the size of the defect requiring coverage in this report was relatively small (23 × 15 mm) and further investigation is needed to validate the maximum possible flap size, this may be applicable to at least small defects, which commonly occur secondary to skin cancer ablation or trauma.

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Fig. 4. Postoperative photograph 9 months after reinsertion of the cochlear implant. Baldness of the donor site was minimized.