

Figure 4.15. Once the flap has been completely incised it is then detached from the periosteum distally and the temporalis fascia proximally. Elevation is easy and quick compared with dissection from the scalp. However, temporal vessels included into the galea should not be injured. Small perforator branches vascularizing the cranial vault are divided, while major branches are divided and ligated.

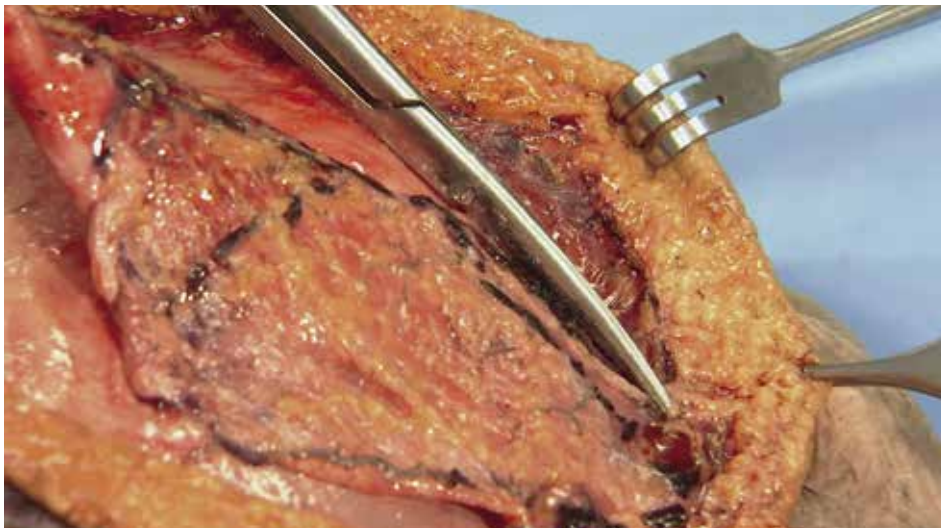


Figure 4.16. Once the flap has been completely incised it is then detached from the periosteum distally and the temporalis fascia proximally. Elevation is easy and quick compared with dissection from the scalp. However, temporal vessels included into the galea should not be injured. Small perforator branches vascularizing the cranial vault are divided, while major branches are divided and ligated.

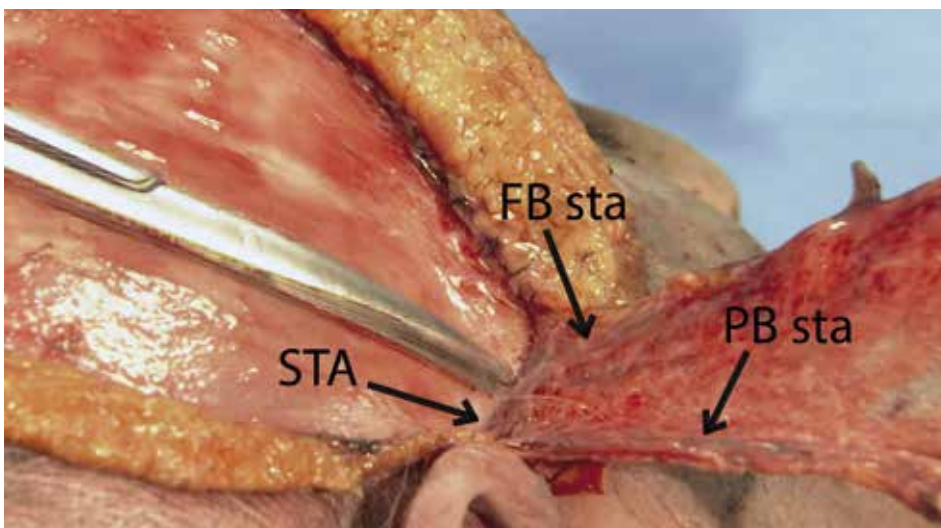


Figure 4.17. Galea flap already elevated showing from its deep surface the STA and its two main branches, the Frontal branch (FB sta) and Parietal branch (PB sta). In case a longer pedicle is needed, STA and galea can be traced over the zygomatic arch.

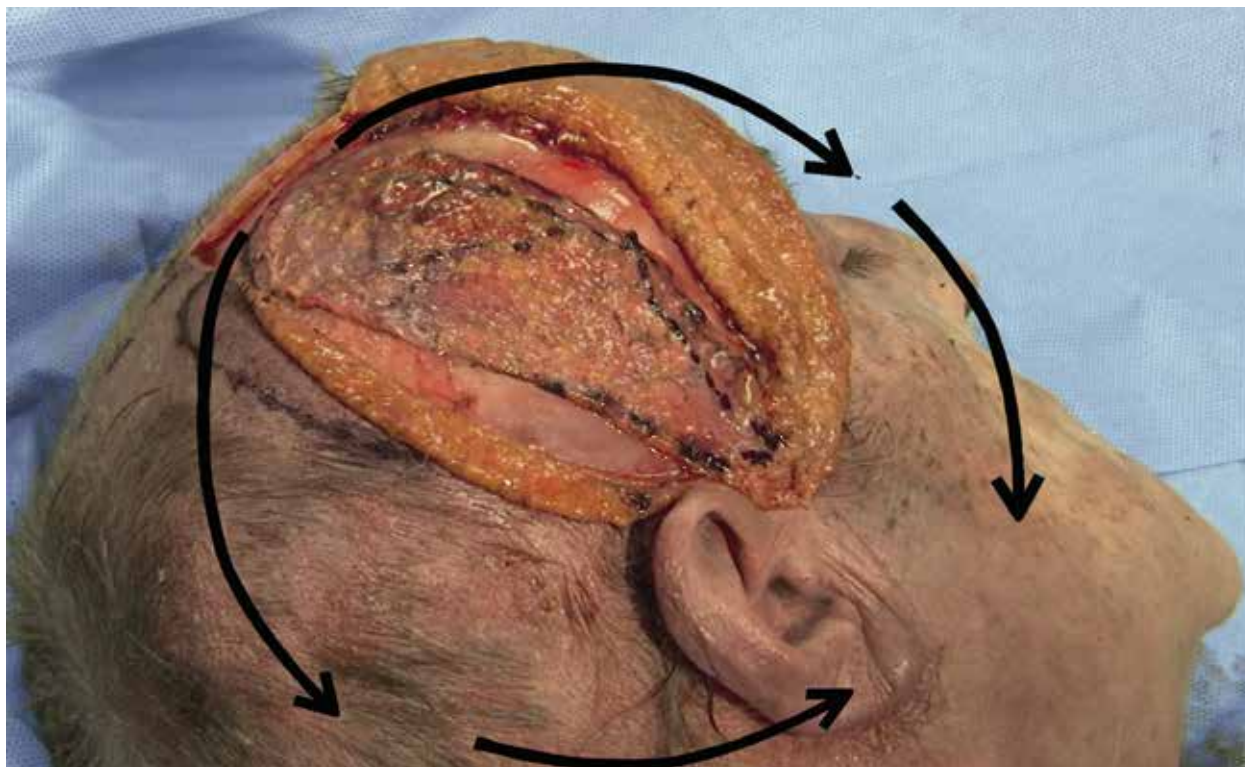


Figure 4.18. Arch of rotation of the superficial temporal artery Galea flap. It is a highly, thin and pliable tissue that can be rotated to cover defects or fill gaps in the two upper thirds of the face, the entire ear and posterior aspects of the parietal bone.

SUPERFICIAL TEMPORAL ARTERY COMPOSITE BONE FLAP

Raising an osteo-galeal flap in practical terms means that a craniotomy has to be performed. When planning a monocortical (outer table) osteo-galeal flap, always consider the possibility of entering or damaging the inner table as well as damaging the dura. Raising of an osteo-galeal flap should not be attempted if not familiar with the management of craniotomies.

The scalp is partially or completely shaved to facilitate surgical manipulation, especially if fistulas or full thickness defects are present. The real size of the calvaria defect has to be determined first, as the real defect can be larger than externally suspected (due to necrosis, osteomyelitis, etc.). Simple X-rays can give enough information about the state of the bone and the extension of the real defect to be removed. Once the real size of the defect has been established, the size of the galea flap is outlined to see if it can effectively fit to gently cover the defect. The galea should always be larger than the defect that it is supposed to cover.

Indications

This composite flap has been successfully used in many situations where a bone defect is present in the skull or face⁽²⁰⁾:

- Large fragments of vascularized parietal bone can be used to repair defects such as large as hemi-mandibulectomies. The major setback for this type of reconstruction is that the surgeon must be familiar with craniotomies and that dental implants can be difficult to use because the limited width of the parietal bone.
- To add bony mass (and volume) or to restore zygomatic bone defects as in craniofacial clefts, especially in severe cases of Treacher-Collins syndrome and other types of clefts affecting the midface.
- Transfer of healthy vascularized bone where cranioplasties have failed after neurosurgical procedures.

Vascularization

See above (galea pedicled flap).

Markings

The area of the final bone defect to be removed is outlined on the scalp as a reference and later, on the exposed galea. The superficial temporal artery is palpated over the preauricular and temporal area and marked as reference, and the galea flap outlined over the scalp into its territory (anterior, medial, or posterior).

Elevation

Individualization of the galea from the scalp is carried out as explained above, though in this case, when a bone fragment will be left attached and elevated with the galea, elevation stops slightly beyond the limits of the outlined bone fragment (fig. 4.9a). Galea should always be left attached to the bone (generally parietal bone) to preserve its vascularization from the terminal branches of the superficial temporal artery. For split thickness bone grafts, osteotomies are initiated by drilling on the outlined limits of the selected piece of bone, until the diploe is reached (Fig. 4.9b). It is easy to recognize the right plane because as soon as the diploe is reached it starts bleeding. The bone can be completely detached with a curved chisel. This is not an easy task and very often the inner table is penetrated during the manoeuvre; especially if the fragment is large. If the decision is made to elevate a full thickness bone graft, craniotomies are performed at each of the bone fragment's corners and connected by osteotomies with a Gigli saw or powered instruments. Great care should be taken when using powered instruments close to the galea, as it can be easily stripped away and detached from the bone. The bone under the pedicle is cut with a Gigli saw (Fig. 4.10a) thus allowing complete elevation of a full thickness parietal bone graft, which is well connected and vascularized to its arterial pedicle (Fig. 4.10b).

However, osteo-galeal flaps remain the ideal option when osteomyelitis is or was present and for localized cranial vault defects where the use of alloplastic materials cannot be considered.

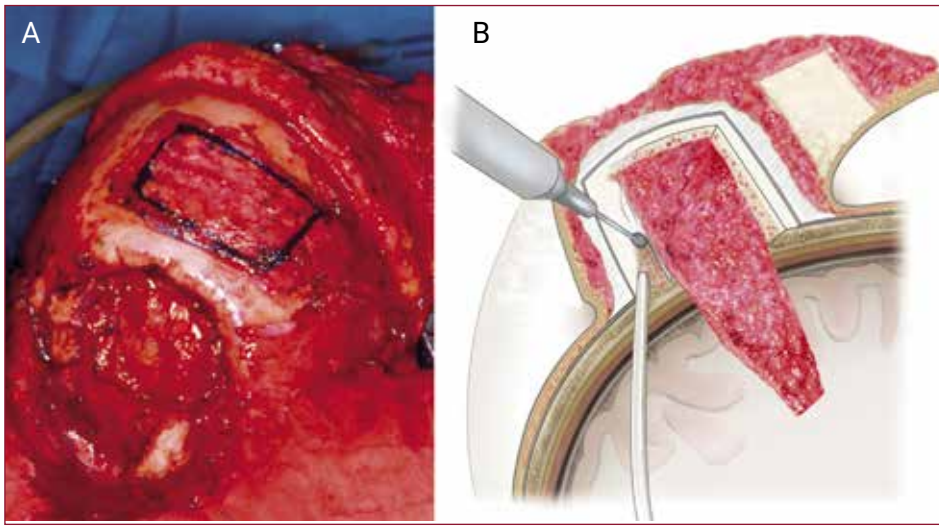


Figure 4.19. A) The galea over the required parietal bone fragment (outlined) has been individualized from the scalp (which can be seen in the upper part folded down over the face) and pedicled on the right superficial temporal vessels. Galea tissue should always exceed the bone fragment boundaries. B) The limits of the bone graft are burred to the diploe for split-thickness bone graft or to the dura for full-thickness grafts. Great care has to be taken when using powered devices close to the galea as it can very easily detach the pedicle from the bone fragment.

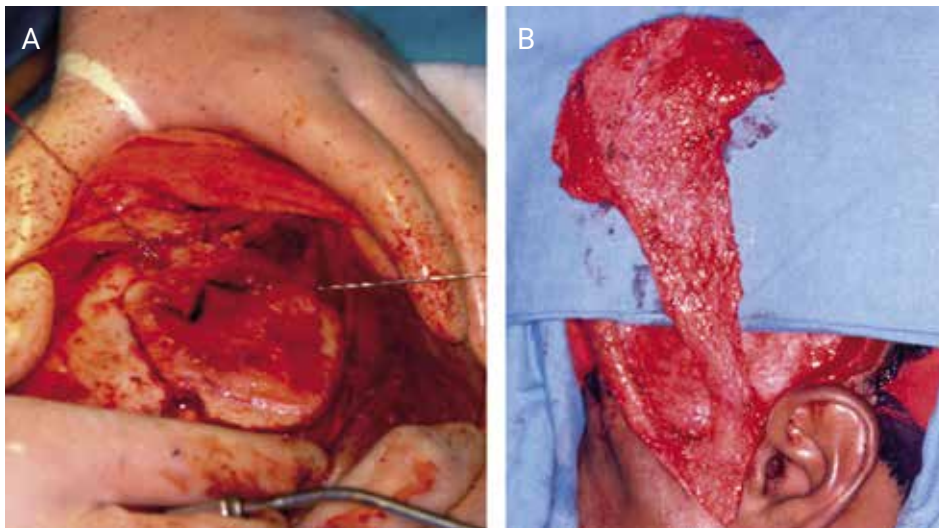


Figure 4.20. A) While osteotomies around the bone fragment can be done with powered devices, the osteotomy under the pedicle is always performed with a Gigli saw. It has to be gently and carefully done as saw movements could easily damage the pedicle. B) Full thickness parietal bone flap pedicled in the superficial temporal vessels running into the galea.