Figure 5.3 (A) Frontal view of a young patient with a history of a right facial arteriovenous malformation, presenting with facial contour deformity following an embolization of her lesion and reconstruction subsequent facial tissue necrosis. Furthermore, there was thrombosis of multiple external carotid branches. (A) The patient continued to have significant facial contour deformity and tethering of right oral commissure following debridement and radial forearm free flap reconstruction. (B,C) Design of flap to be prefabricated in the submental region, with descending branch of the lateral femoral circumflex vascular pedicle transferred into the area and anastomosed with the external carotid; Gore-Tex tubing was applied to the proximal pedicle (visible in C). The transferred pedicle was placed over a tissue expander. (D) Early postoperative result following prefabricated flap transfer. A left facial artery musculomucosal (FAMM) flap was utilized for upper lip reconstruction. (E) Result 6 months later, after two thinning and refinement procedures.

to the burn injury. For cheek and mustache reconstruction, a distant radial forearm fascial flap along with its pedicle is anastomosed into the external carotid and jugular systems and inserted over a tissue expander beneath a hairy postauricular region of the scalp. This newly axialized hair-bearing flap is transposed 8 weeks later to reconstruct the patient's mustache and beard area.

Possibilities with flap prefabrication are endless and many combinations of transplanted vascular pedicles, donor tissues, and geographic locations have been described for various clinical needs. This technique is especially powerful in reconstructing specialized tissues, such as hair-bearing areas and nerves (in cases of vascularized nerve grafts),[39] where conventional approaches are often inadequate.

FLAP PRELAMINATION

CONCEPT

The word "lamination" means bonding together of thin sheets. In reconstructive surgery, the term *flap prelamination* describes a two-stage process. The first stage involves adding different layers into an axial vascular territory, allowing time for the tissues to mature before being transferred. During stage 2 the laminated layers are transferred to the defect as a composite structure based on the original axial blood supply. As with any composite graft, these added layers have to be sufficiently thin or small for them to take. The rationale for prelaminating those layers at a different site prior to transfer rests on the belief that this offers the best chance for the prelaminating layers to heal, stabilize, and assume their expected structures and positions if the construction is done in a reliable vascular bed at a less conspicuous site versus in situ, where local complicating factors can be numerous. This is particularly important for reconstruction of functional units that need to be transferred to complex local environments, where loss of structural integrity may precipitate grave complications, for example, neo-urethra in the perineum and neo-esophagus in the mediastinum.

TECHNIQUE

Aside from skin, the added graft materials may be as diverse as cartilage, bone, mucus-producing membrane,[40] nerve

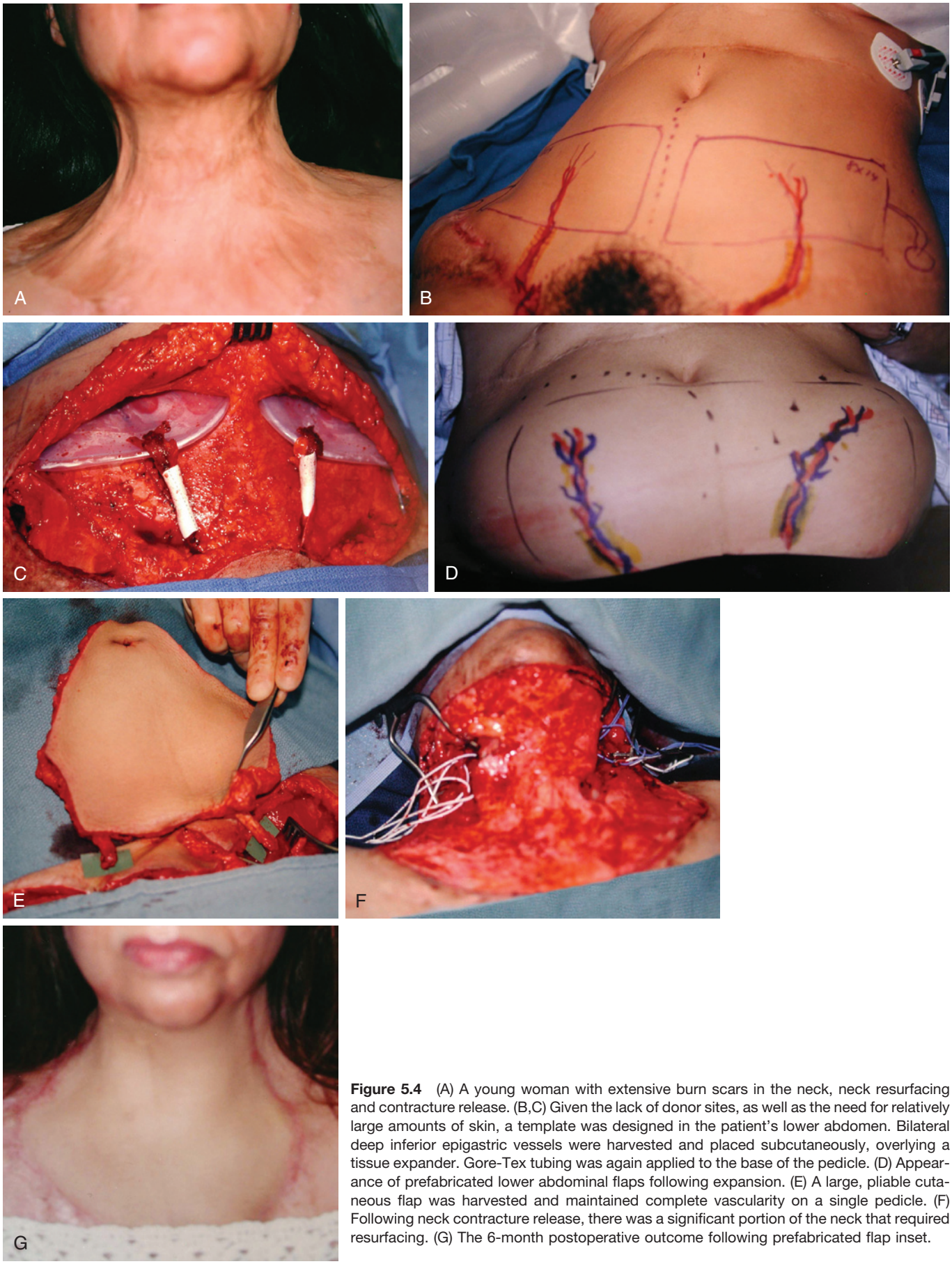

Figure 5.4 (A) A young woman with extensive burn scars in the neck, neck resurfacing and contracture release. (B,C) Given the lack of donor sites, as well as the need for relatively large amounts of skin, a template was designed in the patient's lower abdomen. Bilateral deep inferior epigastric vessels were harvested and placed subcutaneously, overlying a tissue expander. Gore-Tex tubing was again applied to the base of the pedicle. (D) Appearance of prefabricated lower abdominal flaps following expansion. (E) A large, pliable cutaneous flap was harvested and maintained complete vascularity on a single pedicle. (F) Following neck contracture release, there was a significant portion of the neck that required resurfacing. (G) The 6-month postoperative outcome following prefabricated flap inset.