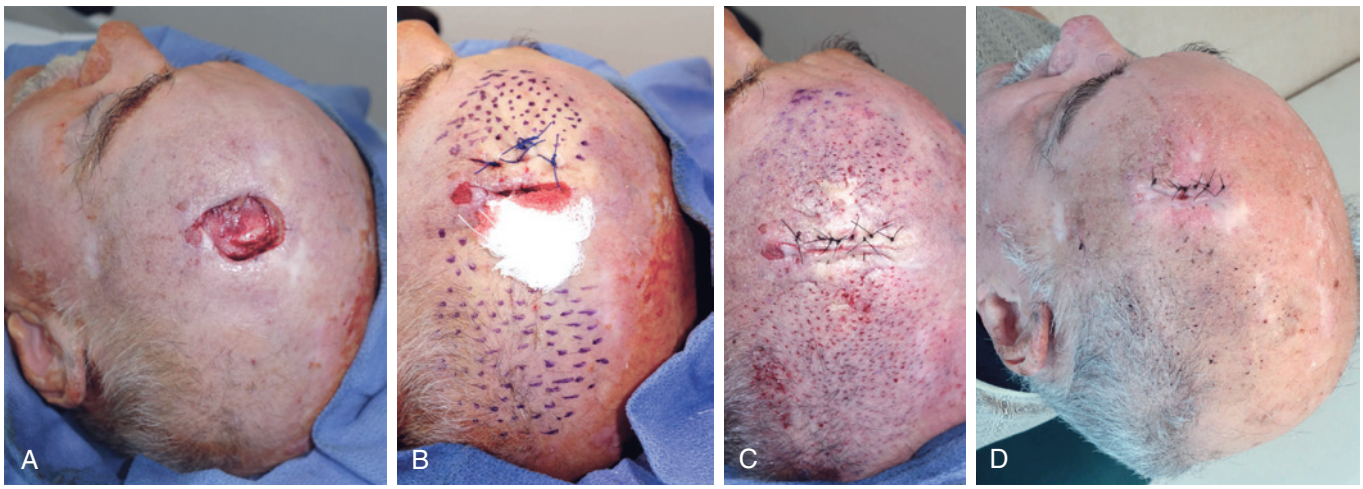

Figure 7.2 Scalp defect closed with PALF instead of a flap. (A) 4×5 cm scalp defect surrounded by scars from previous cancer excisions. (B) Wound edges approximated under extreme tension with retention sutures over bolster. (C) Percutaneously meshing 8 cm on both sides of the defect led to a tensionless closure with 5-0 nylon. (D) Uneventful healing 1 week postoperatively.

Figure 7.3 (A,B) Palmar wound closed with PALF tissue regeneration instead of flap. Mesh expansion of the native palmar aponeurosis allowed tensionless closure with 5-0 nylon stitches. Lipofilling the gaps in the mesh pattern prevented recurrence of the tightness and helped regenerate the needed tissue. This is the principle of the recently described modification of the Dupuytren release technique.[2]

staggered pattern can go through the skin without leaving a permanent scar.
2. Needles only cut fibers under tension; this selective cutting ability spares nerves and other vital structures that are not tight when the contracture is forcefully extended. This then opens the possibility of safely releasing contractures percutaneously without open exposure.
3. Staggered needle-pricks can generate a pattern of slits that mesh-expand in the direction of the tight traction in a fashion similar to a meshed skin graft expansion.
4. The body can regenerate missing tissue to bridge gaps in the 1 mm range, while gaps in the 2 mm range are good recipients for fat grafts with regenerative abilities.
5. A fine mesh pattern of 1–2 mm gaps is capable of expanding the meshed area by 20–30% (meshing ratio 1:1.2). Meshing the tissues also creates a scaffold matrix for fat grafts with regenerative potential.

2-D APPLICATION OF PALF

For patients with contractures or localized surface tissue coverage defects, PALF is an alternative to the classic flap. It generates the tissue needed for the reconstruction in situ, without the traditional incision-needing, scar-creating, and complication-prone flaps.

The crucial component of PALF is strong tension maintained in the direction of tissue deficiency throughout the percutaneous release process. For 2-D hand contractures defects (Fig. 7.4), we use a strong lead hand retractor that maintains strong extension force. For other parts of the body (Fig. 7.5), we use hooks or temporary retention sutures to maintain tension. We then adhere to the following rules as we perform the PALF:

1. Since PALF can safely generate only 20–30% tissue gain over the meshed area, we plan the extent of aponeurotomy mesh release based upon the defect size. For example, to gain 4 cm, plan to release 8–10 cm on each side of the defect.
2. In order to maintain the tension throughout the release process, mesh in an orderly fashion from proximal to distal along the tensed areas. And whenever possible, restore tension as it dissipates with the meshing.
3. To preserve perfusion and the underlying vascular network, do not incise and do not undermine.
4. Release tissues evenly along the entire length of the area placed under tension. It is important to avoid relaxing incisions or localized areas of over-release. These lead to cavities where fat grafts will pool and fail to revascularize for lack of intimate graft-to-recipient interface with a

Figure 7.4 Mid-palmar stellate contracture of the hand treated with PALF. Gunshot blast injury allowed to heal by secondary intension. Despite months of splinting and therapy, the patient has a mid-palmar stellate scar contracture and tendon adhesions that restricted digital extension (A,B). The deficiency was treated with a PALF similar to a Dupuytren contracture release.[2] With the contracture under tension, the restrictive scar was mesh-expanded through multiple punctures and the resultant loosened structure was grafted with 30 mL of dilute lipoaspirate, diffusely injected into the palm (C–G). The hand was splinted in extension for 1 week and then with night splints for 3 months. Results 6 months post-operatively are shown (H,I).[1]