Contents

Fig. 1.2 (**a**) The problem of the skin graft by displaying a visible mesh pattern deformity on the face. (**b**) Severe scar contracture deformities were noted on the dorsum of the hand with dislocated multiple finger joints

This patient exemplifies the problem of the skin graft by displaying a visible mesh pattern deformity of the face, ectropion of both lower lids, and severe scar contracture deformities of the hands, resulting in serious functional and esthetic deformities. Because the author strongly recommends more active early management and proper skin graft selection in the acute stage, surgeons should keep this in mind (Fig. 1.2). A considerable amount of time and effort is needed to correct these problems, which thoroughly demonstrates that the use of a mesh skin graft is contraindicated for the face and hands.

This image depicts a comparison of CEH in an experimental study for rapid healing of wide-mesh grafts, showing a difference in healing time. This figure shows how CEH can effectively epithelialize a large gap in a mesh skin graft and aid in wound healing.

A 42-year-old male patient suffered a flame burn on his right lower leg. (a) Ten days after the procedure, debridement and a 1:3 mesh skin graft

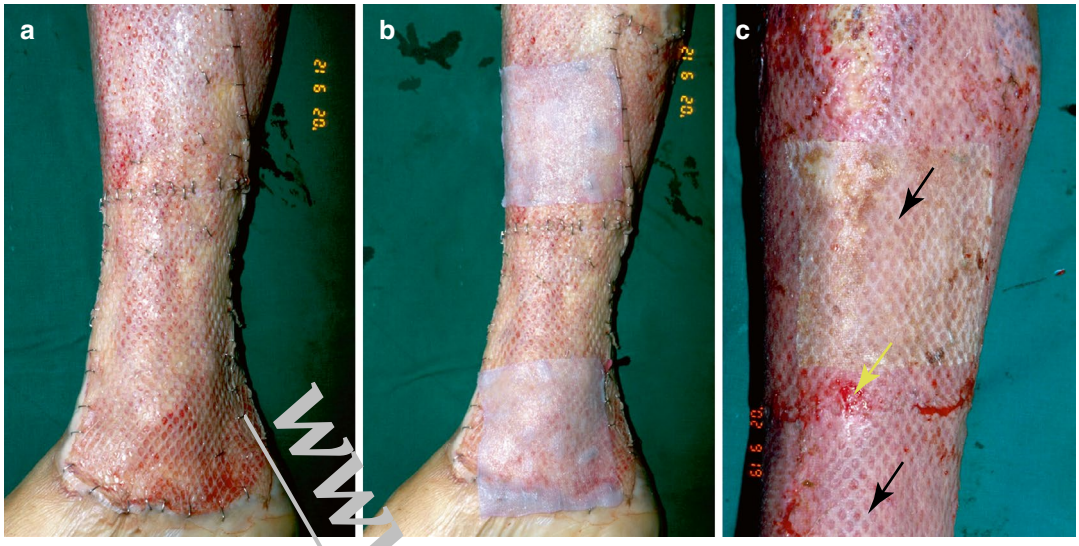

Fig. 1.3 (**a**) 10 days after operation, debridement and 1:3 meshed skin graft was performed. (**b**) Three sheets of CEH were applied on the anterior tibial area. (**c**) After 1 week, well rapid epithelialization was noted on the CEH application site (black arrow) and comparison to the CEH gap site (yellow arrow)

were performed, and (b) three sheets of CEH were applied experimentally on the anterior tibial area. (c) After 1 week, rapid epithelialization was observed on the CEH application site (black arrow) in comparison to the CEH gap site, which remained unhealed (yellow arrow) (Fig. 1.3).

The healing pattern also showed that the epithelialization between the meshes is much more stable, and the contracture progress is less developed, showing a significant difference in the healing process.

This patient was involved in a traffic accident that resulted in an above-knee joint amputation, and the raw surface was left open for more than 2 months, delaying wound healing. We applied a human dermal matrix with a 1:4 mesh skin graft. Shown on figure 1.4, you can see the differnces between the two divided areas, the area that is indicated with black arrow is where CEH was applied shows greater density epithelialization.

In comparison to the area (marked in yellow arrow), where CEH was accidentally removed after one day, shows significant difference in healing progress.

Figure 1.5 shows a reconstructive surgery that was performed to correct a severe scar contracture in a 6-year-old female patient. A 1:6 wide-mesh

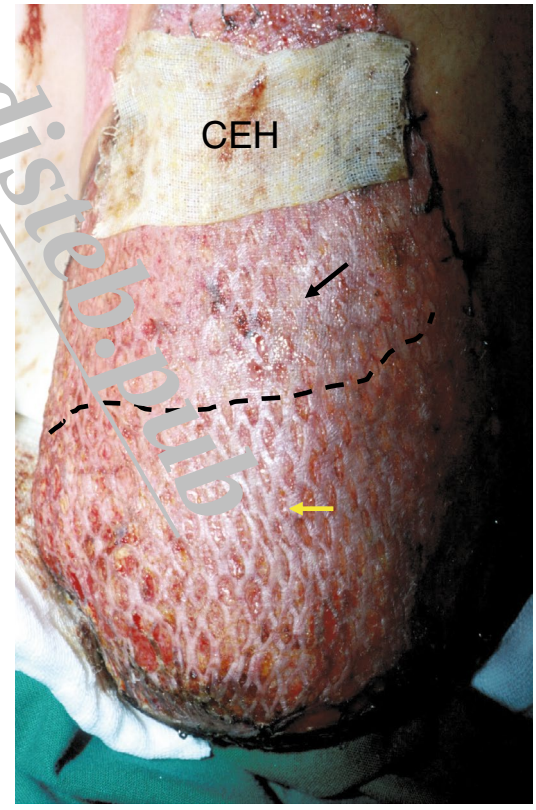

Fig. 1.4 Human dermal matrix with 1:4 mesh skin graft and covered with experimental CEH (above the dashed line). Note the different healing pattern on upper and lower parts

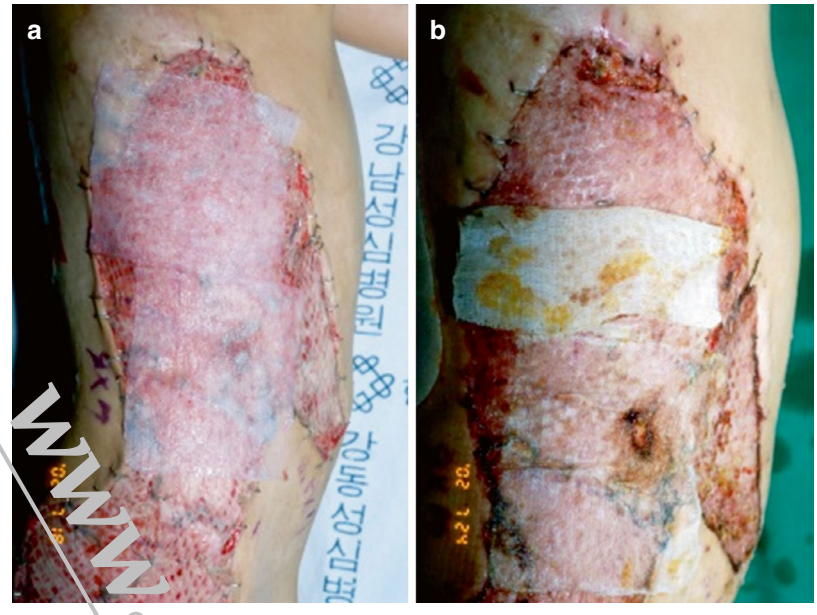

Fig. 1.6 (**a**) 6 days after the operation, the epithelialization was developed very rapidly with stable wound healing process. (**b**) 12 days after surgery, the CEA petrolatum gauze was peeled off and noted engrafted meshed skin was 100% graft take rate

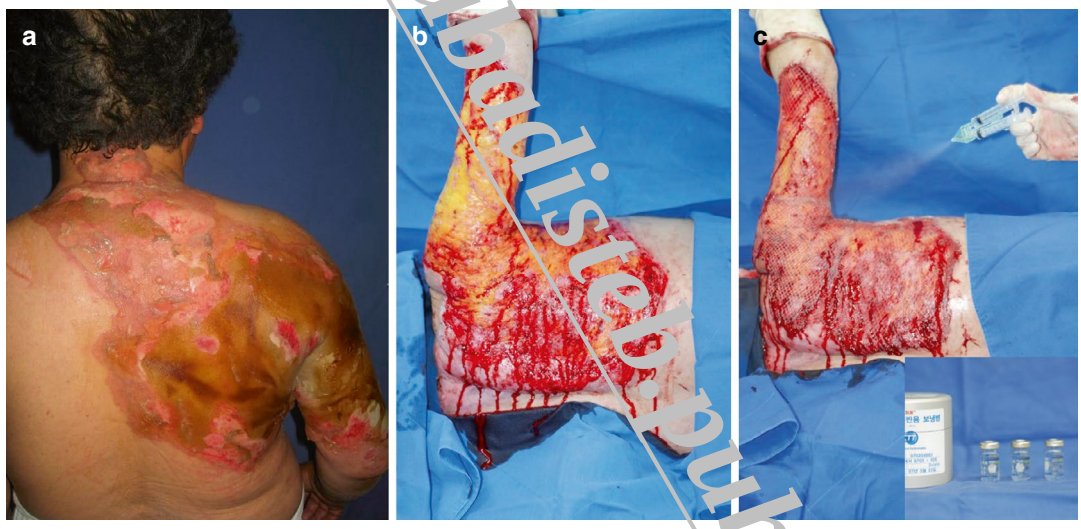

Fig. 1.7 (**a**) This man suffered flame burn on the right shoulder and back area. (**b**) Escharectomy was performed on burn day 17. (**c**) 1:4 meshed skin graft was performed, and three bottles of cell suspension with fibrin sealant were applied

As a plastic surgeon, I personally do not prefer mesh skin grafts, but since they are essential for the management of major burns or extensive wounds, methods using CEH, CEA, and cell spray techniques that are quick and also facilitate wound healing were briefly introduced in this chapter, especially cell spray technique was observed to have a quick culture time, usually 2 weeks, with none usage of the sheets that are high in cost. This will be described in detail in Chap. 4 Cultured Epithelial Cell Therapy.

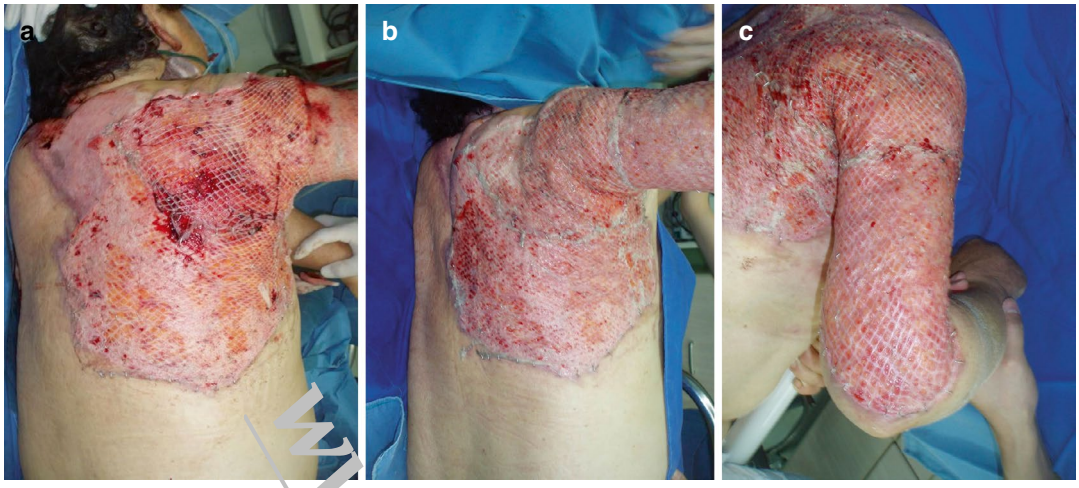

Fig. 1.8 (**a**) Postoperative day 5, operation wound was opened. (**b**) One week after the operation, marked epithelialization was noted. (**c**) Postoperative day 10 after view, 100% graft take rate was shown

1.3 Split-Thickness Skin Graft

STSG is a representative skin graft technique that grafts the full layer of the epidermis and part of the dermis using a hand or electric dermatome or skin-sampling knife. This is a useful method that can cover a wide area of a wound. In addition, because the skin engraftment is better than a full-thickness skin graft (FTSG), STSG can quickly and effectively cover and treat burns or trauma. It is the most frequently used and widely known method owing to the fact that it can be easily used in all cases of small wound size by collecting a sample with a razor or Blair/Humby knives, for slightly larger sites. However, the texture of the transplanted site is poor, with pigmentation that is not harmonious with the surrounding tissue and is prone to contracture deformation leaving large pigmentation lesions with rough, irregular hypertrophic scars on the donor site, indicating that STSGs lead to functional and cosmetic damages. Moreover, as compared with FTSG the secondary contracture of the engrafted skin surface is observed after engraftment, consequently affecting the surrounding tissues, and scar contracture deformities become unavoidable. However, if more systematic management of graft thickness, appropriate engraft timing, bleeding control, and postoperative dressing are ensured, more satisfactory functional and cosmetic effects can be achieved while managing acute hand burns; moreover, subsequent reconstructive surgery may not be required.

Therefore, the author prefers an intermediate thickness that does not exceed 0.25–0.3 mm (10–12/1000 inches) for most skin thicknesses. Recently, prevention of unsightly scars of the donor site has garnered a considerable degree of interest; thus, the author focused on an accurate excessive doner collection is avoided from the selected doner site, keeping it thinly as possibe no more than 0.3 mm in thickness (12/1000 inches).

In the case of the author, a thickness of up to 0.38–0.5 mm (15–20/1000 inches), thick STSG can be used in cases in which a high-quality texture of the skin is considered, such as for the correction of the upper and lower lid ectropion or scar contracture correction around the nose,