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7

Percutaneous Aponeurotomy and Lipofilling (PALF): A Regenerative Alternative to the Flap

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INTRODUCTION

"Don't cut what you don't see!" This rule mandates large incisions and wide open surgical exposure to safely dissect aponeurotomic fibers and release restrictive scars or fascial structures.

"Borrow from Peter to pay Paul." This fundamental principle of flap reconstruction in plastic surgery creates defects at the donor site, generates more scars, creates wound healing issues, and often leads to reconstructions that look like patchwork.

We have recently developed the percutaneous aponeurotomy and lipofilling (PALF) procedure as the regenerative alternative to the classic open scar releases and flap transfers (Figs 7.1–7.3). Instead of "borrowing from Peter to pay Paul," we developed an incisionless way to release contractures and induce Paul to regrow and regenerate the needed tissue himself. PALF is based upon the following fundamental principles and observations:

1. Needle-pricks in the 1–2 mm range leave no scars (this is why intravenous lines usually leave no scars). Therefore, multiple nicks with a 1 mm needle applied in a

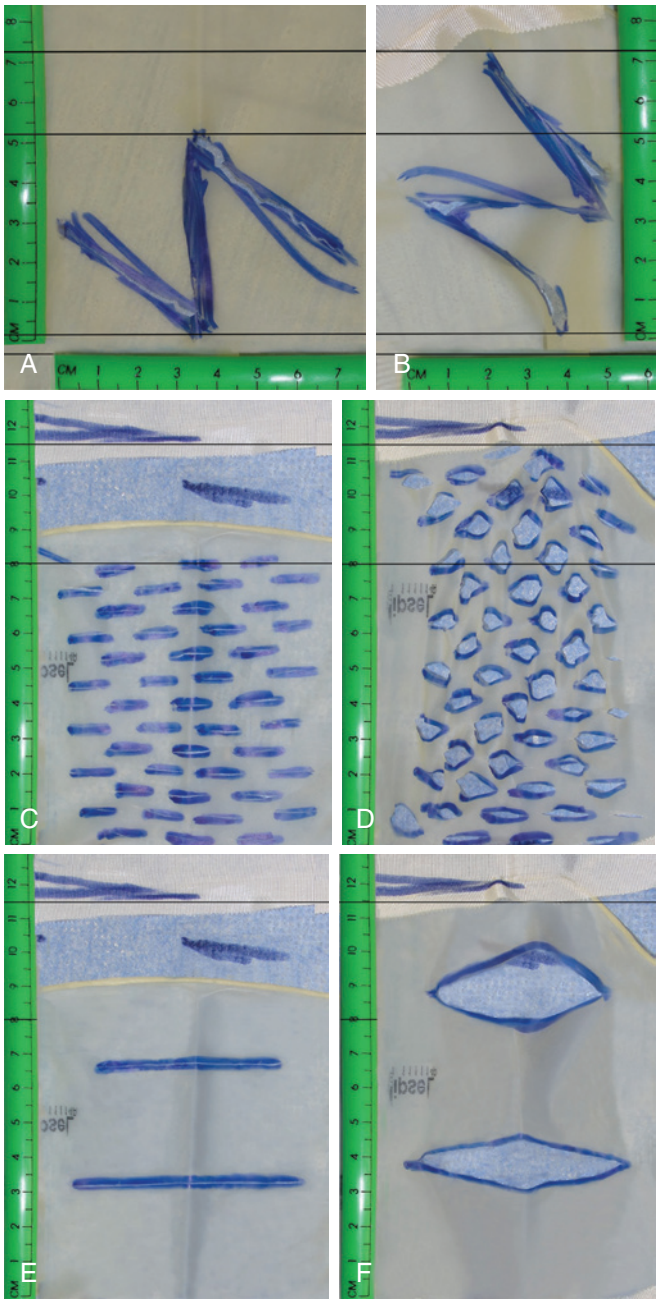

Figure 7.1 FLAP vs PALF vs relaxing incisions: Z-plasty flap transposition (top) is compared with the PALF procedure (middle) and the fasciotomy/relaxing incisions (bottom), simulated on a surgical glove with incisions outlined with a blue marker. (A,B) In the classic Z-plasty flap transposition, a 5 cm vertical tightness is expanded to 7 cm at the expense of a horizontal tightness. "*Borrowing from Peter to pay Paul*" resulted in no overall tissue gain. Scars were left behind and flap necrosis and wound healing issues were risked. PALF uses a series of small percutaneous nicks to mesh the deeper tissues that restrict advancement. (C,D) Mesh expansion of the restrictive subcutaneous tissue enlarges the flap from 8 to 11 cm, while leaving behind a network of small gaps where fat grafts can survive. A net 3 cm tissue gain (30%) was generated without new scars. (E,F) In the fasciotomies or relaxing incisions, instead of meshing the tissue with multiple tiny nicks, two large cuts are made. Advancement of the tissue is not as even and the cuts expand into large open spaces where fat grafts would pool with poor interface with the recipient, leading to fat necrosis, fibrosis, wound healing issues, and likely loss of the expansion from scar contraction.[1]