Principles and Algorithm for the Microsurgical Treatment of Unstable Keloids on the Trunk after Burn Injury

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Introduction: Unstable keloids are one of the most frustrating clinical problems in wound healing and the pathogeneses remains largely unknown.[1] To date, little is known in the literature about the microsurgical management of unstable and middle-sized keloids on the trunk, and a clear consensus is lacking.[2] Perforator flaps are thin and pliable, have a robust blood supply, potentially release the scar-site tension effectively and may provide an outcome with well-matched color, thickness, and texture.[3,4] In this study, we provide a versatile algorithm by using various pedicled and free perforator flaps for the treatment of keloids on the trunk.

Materials and Methods: Patients with a history of multiple treatments of middle-sized keloids on various regions of the trunk were included. Color Doppler ultrasound (CDU) and multidetector-row computed tomographic angiography (MDCTA) were performed preoperatively. Depending on the location of the keloid, the following flaps were used: superficial circumflex iliac artery perforator (SCIP) flap, internal mammary artery perforator (IMAP) flap, superior epigastric artery perforator (SEAP) flap, anterior intercostal artery perforator (AICAP) flap, deep inferior epigastric artery perforator (DIEP) flap and anterolateral thigh (ALT) flap.

Results: Between June 2013 to June 2015, 29 patients (15 male and 14 females) with a mean age of 41±15years were treated. Totally, we performed 5 free SCIP flaps, 2 pedicled SCIP flaps, 8 IMAP flaps, 6 SEAP flaps, 3 AICAP flaps, 4 DIEP flaps and 1 ALT flap. The mean flap size was 83±36cm^2 and the mean flap thickness was 14.8±5mm. One partial distal necrosis occurred after a pedicled AICAP reconstruction, which healed conservatively. After a mean follow-up of 5±3months, all surviving flaps showed excellent thickness, texture and color match. Importantly, there was no need for secondary debulking surgery. The donor site healed well after primary closure in all patients.

Conclusion: We successfully applied various free and pedicled perforator flaps for the treatment of unstable keloids on the trunk. Based on our experience, we provide a useful and reliable algorithm in order to achieve the best possible outcome.

References:

1. Ogawa R, Chin MS. Animal models of keloids and hypertrophic scars. J Burn Care Res 2008;29(6):1016-1017
2. Wang J, Min P, Grassetti L, et al. Preliminary Outcomes of Distal IMAP and SEAP Flaps for the Treatment of Unstable Keloids Subject to Recurrent Inflammation and Infections in the Lower Sternal and Upper Abdominal Areas. J Reconstr Microsurg 2015
3. Hong JP, Choi DH, Suh H, et al. A new plane of elevation: the superficial fascial plane for perforator flap elevation. J Reconstr Microsurg 2014;30(7):491-496
4. Koshima I, Soeda S. Inferior epigastric artery skin flaps without rectus abdominis muscle. Br J Plast Surg 1989;42(6):645-648