Atrophic Scars: Reinforcing the Flap Mattress Using Adipocyte Transfer in Paraplegic Patients at Risk of Pressure Ulcer Recurrence

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Contents

63.1 Medical History – 532

References – 533

63.1 Medical History

A 28-year-old man became paraplegic after a car accident 10 years ago. He presented repetitive pressure ulcers on the sacrum and the ischions, with successive surgical procedures (flaps, negative pressure, and skin grafting) on both sides.

He was successfully treated on the left side using a rotation flap for an ischiatic pressure ulcer, allowing to restart verticalization. The seated position was allowed after 2 months, progressively allowing a 12-hour-a-day seated position. The flap was followed every month and a progressive crushing of the fat under the ischial tuberosity was noted for a long time, with transient signs of redness appearing 1 year after surgery (■ Fig. 63.1) A Coleman technique using 300 cc of fat was proposed.

? Questions to Medical History

- What is the rationale of using fat transfer in a patient who seems not to respect the postoperative restrictions?
- How to calculate the volume of fat to inject?

■ Intervention 1:

One year later, a Coleman technique was proposed and administered, using 300 cc of fat obtained from the abdomen by liposuction. The fat was centrifugated 3000 t/min during 3 min, and then the substratum was extracted and used as a filler (■ Fig. 63.2). The patient was authorized to remain seated 1 hour a day after 2 weeks and then progressively 1 hour more each month, till 12 hours a day.

■ Fig. 63.1 Paraplegic patient operated 1 year before using a rotation ischial flap on the left side. The fat mattress under the flap skin begins to crush, exposing the patient to the risk of recurrence

■ Fig. 63.2 Fat injection 300 cc, under the flap skin in the most exposed area when the patient is seated

■ Fig. 63.3 A second 450 fat injection was administered 1 year later

? Question Intervention 1

- Is there a risk to inject a large fat volume under a suffering skin?
- Which postoperative protocol is given to the patient in order to prevent the recurrence?

■ Intervention 2:

The patient was followed regularly, and a second injection was done 1 year after the first one (■ Fig. 63.3), in order to compensate a recurrent diminished fat volume. The injected fat volume was increased to 450 cc. The patient was informed to limit his seated position to a maximum of 6 hours a day and to check every day the ischial area, the cushion was reanalyzed and changed.

The patient did not present any recurrence after 2 years of follow-up.

? Question Intervention 2

- Has the patient been informed about the risk of recurrence?
- How to adapt the behavior of the patient during the postoperative period in order to prevent the recurrence?

✓ Answers

Fat transfer has been proposed since a long period of time as a filler [1], and used alone or in combination with PRP [2]. However, the literature suggests that transplanted adipocyte stem cells bring some mechanical properties [3] and help to regenerate the subcutaneous tissues [4], a reason why injections can be administered even under a lightly suffering skin. In this case the postoperative pressure applied over the flap and then over the fat injected area was too high and the patient was not correctly following the protocol. A second chance was given after some alarming signs of suffering on the ischial area had appeared. The volume of injected fat was increased and the therapeutic education provided to the patient was enhanced. The patient was particularly encouraged to limit the daily seating, which he finally accepted, a crucial point to prevent another recurrence.

Take Home Message

Adipocyte stem cells have provided some evidence in scar improvement. This chapter introduces the use of adipocyte derived fillers in scars presenting adherence to the underlying structures or depressions compared to adjacent areas. The use of fat grafting prepared with simple techniques is now considered as a useful adjunctive technique in resurfacing pathological scars.

References

1. Moseley TA, Zhu M, Hedrick MH. Adipose-derived stem and progenitor cells as fillers in plastic and reconstructive surgery. *Plast Reconstr Surg*. 2006;118(3 Suppl):121S–8S.
2. Alser OH, Goutos I. The evidence behind the use of platelet-rich plasma (PRP) in scar management: a literature review. *Scars Burn Heal*. 2018;4:2059513118808773. <https://doi.org/10.1177/2059513118808773>. eCollection 2018 Jan–Dec.
3. Atashroo D, Raphael J, Chung MT, Paik KJ, Parisi-Amon A, McArdle A, Senarath-Yapa K, Zielins ER, Tevlin R, Duldulao C, Walmsley GG, Hu MS, Momeni A, Domec B, Rimsa JR, Greenberg L, Gurtner GC, Longaker MT, Wan DC. Studies in fat grafting: Part II. Effects of injection mechanics on material properties of fat. *Plast Reconstr Surg*. 2014;134(1):29–38.
4. Scioli MG, Bielli A, Gentile P, Mazzaglia D, Cervelli V, Orlandi A. The biomolecular basis of adipogenic differentiation of adipose-derived stem cells. *Int J Mol Sci*. 2014;15(4):6517–26. <https://doi.org/10.3390/ijms15046517>. Review.

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