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The Inguinal Adipodermal Graft: a Single-Stage Technique for Cranial Linear Groove-like Defects Correction

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ABSTRACT

Introduction: In reconstruction of post-traumatic craniofacial defects Palacos R-40 is mostly used by neurosurgeons and by maxillofacial surgeons after tumor removal with consequently noticeable irregularities on the shape of the cranial region and face. We harvested customized adipodermal (AD) graft in low inguinal region and use it as an inlay autologous graft for surface irregularities correction with a 100% survival and without noticeable reduction of the graft volume. **Material and Methods:** Between 2009 and 2015, an adipodermal graft was used in 5 cases of craniofacial post-traumatic defects, 3 of which were due to Palacos R-40 cranial reconstruction and 2 connected to maxillofacial tumor removal and post-traumatic reconstruction. **Results:** There were no complications and a satisfactory aesthetic result was achieved in all cases. **Conclusion:** The inguinal inlay autologous AD graft is, due to our best knowledge, an original single-stage procedure for those typical cranial groove-like defects correction. It gives a wide option of different shapes with relatively easy to proceed and predictable result.

Key words: autologous, adipo-dermal, graft, craniofacial, defects.

1. INTRODUCTION

In recent years autologous fat transplantation employing liposuction has become an established method for correction of small soft tissue defects and irregularities of skin contour. But in the case of a large cranial and craniofacial superficial linear defects fat transplantation alone, especially under a tight skin region, will result in fat necrosis. So, only a small amount of fat may be used because fat cells will be nourished by perfusion alone (1). Facing the inappropriate correction of the tight linear superficial cranial linear defects at the border of Palacos R-40 used for reconstruction of post-traumatic cranial defects with fat transplantation alone we decided to try autologous free adipodermal (AD) graft instead of fat alone, already described in reconstruction of facial contour defects resulted from tumor extirpation, congenital

deformity, trauma, or degenerative disease (2).

2. MATERIAL AND METHODS

The first two of five cases were patients with a recess or hollow at the temporal region after maxillofacial tumor removal and post-traumatic reconstruction respectively. We draw a custom made pattern in inguinal region due to dimensions and shape of the hollow, deepithelialize it in situ with a scissors, excise a dermal graft with attached subcutaneous fat (Figure 1) and close the donor site directly. Then we made a separate incision above the temporal hollow in the hairline, dissect the pocket and insert the AD graft as an inlay patch. The most important surgical detail is the dissection plane at the level of deep dermis without a fat tissue and putting the graft on the way to keep in close touch the deep dermis of the temporal skin and deepithelialized

Figure 1: a) deepithelialized AD graft, b) pulling through the linear inlay AD graft with the help of plastic tube as a probe through the tunnel, c) typical cranial groove-like defect – frontal view

Figure 2: a) typical cranial groove-like defect – oblique view, b) overcorrection of the defect, c) the final result

site of the AD graft. The idea is to enable a rapid vascular in-grow through the dermis-dermis contact and indirectly to the fat tissue below. We decided to try the same method for long linear groove like defect in a parietal region after unsatisfied attempt to correct it with lipofilling. The next three patients suffered from post-traumatic linear defects, 14, 15 and 17 cm long respectively, after neurosurgical cranial post-traumatic reconstruction with Palacos R-40. One of them was a policemen demanding for correction because of profession, the rest because of cosmetic. We did the harvesting from the same region with appropriate length and width of the graft, dissecting the tunnel below the defect at the level of deep dermis and pulling through the linear inlay AD graft with the help of plastic tube as a probe through the tunnel (Figure 1). We tailored the harvested AD graft on the way to make the 10 % overcorrection of the defect (Figure 2). The care was taken again to have a good dermis-to-dermis contact of the AD graft and superficial skin.

3. RESULTS

There were no complications (graft resorption or epithelial cyst formation) and a satisfactory aesthetic result was achieved in all patients as determined by the patient and the surgeon at the last evaluation 1-5 years after the procedure respectively.

4. DISCUSSION

Dermal grafts with attached subcutaneous fat, free adipodermal (AD) grafts were used for surgical treatment of progressive lipodystrophy (3) and plasty of hypo and aplastic breast more than four decades ago (4). But for breast augmentation with gluteal dermofat grafts in one study of 5-10 years follow-up about a quarter had either to be removed or disappeared completely, while the remainder shrank unpredictably and were all calcified by

the end of 4 years, plus the donor site on the buttock was often unsightly. Complications with homologous fat graft obtained from fresh cadavers in breast augmentation surgery were even worse (5). Talking about breast augmentation we hypothesize that even with autologous free adipodermal (AD) grafts is not easy to insure a full dermis-to-dermis contact for proper in-grow and neovascularisation of the fat tissue through the deepithelialized dermis. Some articles report even a large volumes of fat-only transplants to the buttocks and legs for aesthetic enhancement or correction of deformities can give a good long lasting results (6). But for region with a tight skin like the groove-like linear defect in the cranial region fat-alone graft or lipofilling could not resist the tension and the fat is by pressure milked away from the groove and scar tissue. Resorption on that way, in our hands, was also extremely high, even two thirds of the volume with unsatisfied results from the cosmetic point of view. We hypothesize that with autologous free AD graft reduction of the volume is due to reduction of edema more than resorption of the fat. The dermis-to-dermis contact could support the fast in-grow of the new vessels and vascularize the fat below even for a such long and narrow graft resisting the tension of the scar tissue above the defect.

5. CONCLUSION

The inguinal autologous free inlay AD graft is, due to our best knowledge, an original single-stage procedure for purpose of cranial groove-like linear defects correction. It gives a wide range of different shapes with relatively easy to proceed and predictable 1-5 years result. But for really long lasting results we need a 10 years follow up.

• Conflict of interest. None declared.

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