Clinical case

Complex Rehabilitation of Patients with Defects and Deformities of the Maxillofacial Region Using the Method of Autografting of Adipose Tissue

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Abstract: the Central Research Institute of Oral and Maxillofacial Surgery has extensive experience in treating patients with and deformities of the maxillofacial region. This article presents clinical cases of lipofilling as an additional method in the complex reconstructive-surgical treatment and also as a method of choice for complete patients of this group.

Keywords: plastic surgery, lipofilling, defect, scar, deformity of the face

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1. Introduction

Soft tissue injuries of the maxillofacial region are one of the causes of disability due to the development of post-traumatic defects and deformities with functional disorders, sometimes requiring multiple recurrent onstructive and restorative operations and long-term social adaptation. More than half of the cases reveal extensive and deep injuries with the formation of true defects of organs and tissues [1]. Classical methods of elimination of defects of the maxillofacial region are: plasty with local tissues, autografting of free flaps of covering tissues or use of complex combined flaps, use of various kinds of materials for volume contouring [2].

Lipofilling is a method of surgical transfer of autologous adipose tissue from areas of excessive accumulation of fat in order to correct the volume and restore the contours of the so-called "zones of interest". [3]. The autologous fat transfer technique has over 100 years of history. The founder of this technique is considered to be the German surgeon G. Neuber, who in 1893 transplanted autofat into the area of periorbital cicatricial deformity resulting from osteomyelitis [4]. Thanks to the work of E. Hollander, E. Lexer and A. Pennisi, by the 1920s, the technique had reached the peak of its popularity. after which, due to a number of complications (liponecrosis, fibrosis, cyst formation, etc.), interest in it gradually faded away [3]. In the 1980s, interest in lipofilling gradually resumed due to the wide spread introduction of liposuction techniques into plastic surgery. The method got its "second breath" due to the works of American surgeon M. Birkall who in 1987 published the results of autologous transplantation of adipose tissue obtained after liposuction in order to increase and / or reconstruct breasts [5].

During the last decades the range of indications for injected adipose tissue transplantation has significantly expanded, which after the work of P. Zuk et al. in 2001 began to be considered as a rich source of multipotent mesohymal stem cells (MSCs) [10].

2. Patients and Methods

2.1. Lipofilling technique.

The results of the surgery largely depend on the technique of its performance. Lipofilling includes the standard stages: fat sampling, processing and injection of autogrease. Fat extraction is the main stage of lipofilling, which largely predetermines the effect of the intervention [11]. The most widespread method of fat extraction is the method described by S. Coleman (2006) [6]. An important part of the work is the technique of fat tissue aspiration, preparation of aspirated cells for transplantation [9]. The intervention can be performed under general or local anesthesia. The choice of donor areas is made before surgery individually for each patient.

In clinical studies, the loss of adipose tissue volume ranges from 30% to 60% within 4-6 months after surgery [7]. Thus, when calculating the required volume, the possible loss of adipose tissue should be taken into account. Therefore, most surgeons adhere to the so-called hypercorrection rule [8]. However, in some cases, hypercorrection is not possible due to a number of reasons (size of the defect, impaired microcirculation, loss of skin elasticity after radiation therapy, etc.), which implies an individual approach to the choice of treatment tactics and the need for repeated stages to achieve the desired effect.

2.2. Clinical case.

A 6-year-old patient was treated in "Central Research Institute of Oral and Maxillofacial Surgery" with the diagnosis: defect and scar deformity of the temporal, zygomatic and cheek areas on the left side. Condition after a traffic accident. The patient was admitted on the 7th day after the injury; there was a full-thickness soft tissue defect of the zygomatic region with exposure of bone tissue.

In this case, a dermal fascial flap on the temporal artery, characterized by an optimal ratio in terms of the volume and area of the defect, good blood supply and minimal damage to the donor area, was used to repair the defect (Fig. 1).

Figure 1. Defect repair of zygomatic area with application of dermal-fascial flap on temporal arter

Figure 2. Patient after two stages of lipofilling

Then, to change the qualitative characteristics of the scar and soft tissue dermatension in the periphery, 2 stages of lipofilling were performed 6 months after surgery with a frequency of once every 4 months (Fig. 2).

At the moment the patient is at the stage of rehabilitation, laser resurfacing and correction of the color of the scar deformity is planned. A number of laser hair removal procedures are being planned for the hair.

2.3. Consider the second clinical case

A 34-year-old female patient diagnosed with posttraumatic deformity of the midface on the right side. Condition after a car accident (Fig. 2).

In the presence of a defect of the supporting structures of the maxillofacial region, the microsurgical stage for complete rehabilitation is a priority in most cases. In this patient, a microsurgical operation with a soft tissue-bone flap was planned in order to eliminate the defect and deformity of the midface on the right side. However, given the area of the scar tissue affected by the process, a series of autotransplantations of adipose tissue were performed in order to prepare conditions for subsequent transplantation of the recipient area tissue flap. Within a year after the first lipofilling, the required volume was achieved in the zygomatic and suborbital areas, which allowed us to restore the contour of the middle face and achieve a high aesthetic result without the need for complex microsurgery with the existing risk of flap rejection and prolonged postoperative rehabilitation of the patient.

Figure 2. Patient before and after the four stages of lipofilling.

3. Conclusions

Inclusion of autotransplantation of adipose tissue into the algorithm of reconstructive and surgical treatment in cases of extensive defects and deformities of the maxillofacial region allows optimizing the results of complex treatment. The use of lipofilling as one of the methods of reconstruction in patients with posttraumatic deformities of the maxillofacial region is becoming increasingly popular due to the simplicity of the technique, low frequency of postoperative complications, satisfactory aesthetic results and regenerative effect on tissue. Lipofilling should also be considered as a full-fledged method when there is a need to change the qualitative characteristics of the skin and to correct minor deformities.

Thus, the lipofilling procedure should be considered an integral part of both stage rehabilitation and full-fledged independent treatment of patients with maxillofacial defects and deformities.

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The use of artificial intelligence: the article is written without the use of artificial intelligence technologies.

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