

Patient with Linear Scleroderma “En Coup De Sabre” – Nano Lipofilling Followed by Hair Transplantation

Evgeni Sharkov^{1,3*}, Radoslav S Todorov^{2,3}, Atanas Yonkov^{2,3}, Dimitar Simeonov¹, Martin Stefanov⁴

¹University Hospital for Active Treatment Alexandrovska, Clinic of Plastic Reconstructive and Aesthetic Surgery, Sofia, Bulgaria

²University Hospital for Active Treatment Alexandrovska, Clinic of General and Liver-Pancreatic Surgery, Sofia, Bulgaria

³Department of Operative Surgery, Faculty of Medicine, Medical University of Sofia

^{4,1}University Hospital for Active Treatment Alexandrovska, Clinic of Dermatology and Venereology, Sofia, Bulgaria

*Corresponding author

Evgeni Sharkov, University Hospital for Active Treatment Alexandrovska Clinic of Plastic Reconstructive and Aesthetic Surgery Sofia, Bulgaria Bld., Georgi Sofiyski 1 Sofia, Postal code: 1000, Bulgaria

Submitted: 07 Apr 2021; Accepted: 15 Apr 2021; Published: 22 Apr 2021

Citation: Evgeni Sharkov, Radoslav S Todorov, Atanas Yonkov, Dimitar Simeonov, Martin Stefanov (2021) Patient with Linear Scleroderma “En Coup De Sabre” – Nano Lipofilling Followed by Hair Transplantation. *Adv Bioeng Biomed Sci Res* 4(2): 29-32.

Abstract

Linear scleroderma, also known as “en coup de sabre”, is a subtype of localized scleroderma. It develops in the area of the forehead and hairy part of the head, causing alopecia of the affected area (Figure 1). The applied aesthetic correction involves filling the defect on the forehead and capillitium with nano lipofilling, which is followed two months later by performing FUE hair transplantation (Figure. 2, 4). The combination of these procedures allows simultaneous filling of the hypotrophic scar, as well as a more secure and rapid growth of the hair grafts. Thus, a good, long-lasting and patient-satisfying aesthetic result is achieved.

Keywords: Linear Scleroderma, En Coup De Sabre, Nano Lipofilling, Hair Transplantation

Introduction

Scleroderma is a chronic connective tissue disease which develops under two different forms – progressive (systemic) and limited (localized). Approximately two-thirds of the cases are identified under the age of 18. Etiology is unknown; however, an autoimmune genesis is considered to be the most likely cause.

Linear scleroderma, also known as en coup de sabre, is a subtype of localized scleroderma. It is manifested by the formation of a scar-like lesion in the area of the forehead and on the frontal and/or frontal-parietal scalp, where hypotrophy of the skin and the subcutaneous tissue is observed, and in more rare cases hypotrophy also involves the muscles and the bones. The lesions occurring in the area of the scalp cause the development of alopecia (Figure 1). En coup de sabre scleroderma may develop as a self-restricting disease, going through a certain regression or softening of the skin lesions which often occurs spontaneously, although complete disappearance of the lesion is unusual. The treatment of the active and fibrous forms often includes various different topical or oral treatments. phototherapy or both. Unfortunately, even if the activity of the disease has once been reduced, patients often remain

with noticeable atrophy of the skin. Remaining lesions may leave disfiguring scars that could be a reason for a psychosocial disorder of the patients [1].

Literature has described various approaches for reconstruction of linear scleroderma, including grafting with autologous tissues and use of alloplastic materials, tissue expanders, soft tissue fillers [2]. This article considers the treatment of linear scleroderma, en coup de sabre, with nano lipofilling followed by hair transplantation (Figure 3, 5).

Case Report

In a patient diagnosed with en coup de sabre scleroderma and a performed physical examination a vertically oriented hypotrophic scar with a length of 14 cm has been found, involving the zone from the frontal area of the scalp towards the glabella and the right half of the forehead. Hypotrophy of the skin and the subcutaneous skin tissues is observed (Figure 1). The patient has none identified systemic manifestations of scleroderma and there are no data of a previous medicinal or surgical therapy.



Figure 1: A female patient with linear scleroderma en coup de sabre

Under local anesthesia in combination with NLA sedation, nano lipofilling was started with the stomach area preferred for a donor, from which the fatty tissue needed for performance of the procedure was aspirated. The entry points for the infiltration cannulas were anesthetized with pure Lidocaine 1%. Infiltration was performed utilizing 100ml Klein solution. It was followed by harvesting of the fatty tissue with a cannula connected to a 10ml Luer-lock syringe, using low vacuum pressure for that purpose. The extracted fatty tissue was left to sediment under gravity force. The obtained fat was filtered through three anaerobic transfer adaptors placed between two syringes. The start was set with adapter 2.4, transferring the fatty tissue from one syringe to the other 30 times. The same followed through the other two transfer adaptors, 1.4 and 1.2, respectively. In the last phase of processing the fatty tissue, it was filtered through an S (small) cartridge filter. The obtained tissue is extremely rich in growth factors and stem cells. The so processed fatty tissue is transferred into 10ml Luer-lock syringes. Nano lipofilling was performed - 14ml in the area of the forehead and 12ml in the area of the hypotrophic scar in the head scalp, using a 20G blunt cannula for the injection (Figure 2). The remaining 3ml of fatty tissue were transferred into 1ml Luer-lock syringes and injected with a 4mm needle, under the form of mesotherapy in the area of the face.



Figure 2: Immediately after nano lipofilling in the area of the fore-

head and the alopecia area in the hairy part of the head

Two months after the applied nano lipofilling no complications have been registered. The patient is satisfied with the result in the area of the forehead, although at the available physical examination a residual depression was identified due to the expected resorption of a part of the transferred fatty tissue (Figure 3). A reevaluation of the effect in the frontal area and a probable second nano lipofilling procedure are pending during the fourth month, of which the patient has been informed as a part of the therapeutic plan.



Figure 3: Two months after nano lipofilling and immediately before hair transplantation in the area of the scalp

Following an assessment of the condition it was time to proceed towards the next stage – hair transplantation. FUE vacuum-assisted technique was applied utilizing SmartGraft, and the procedure was performed under local anesthesia. The back of the head was used as donor, with extraction of 400 grafts among which single, double and multiple follicles have been identified. The next step was to proceed towards the placement of the follicles into preliminary prepared beds in the area of the alopecia (Figure 4).



Figure 4: Immediately after FUE-vacuum assisted hair transplantation

A problem in the implantation of the follicles could be the reduced retention capacity of the scarification tissue which is due to the lower number of elastic fibers in it. This results in a more difficult fixation of the follicle in its new bed. To avoid this, a preliminary assessment is necessary of the proportions between the incisions

and the available grafts. Despite the improved condition of the skin due to the nano lipofilling, the presence of more fatty tissue in the subcutaneous layer results in loosening of the bond between the skin and the underlying structures and this makes it considerably more movable [3].

The lack of skin appendages increases the likeliness of occurrence of an infection, and therefore it is necessary to perform the procedure in sterile conditions, as well as to start a preoperative antibiotic therapy [4].

Ten days after the performed hair transplantation no postoperative complications were identified. The patient is satisfied with the obtained result. The hypotrophic scar is well filled up with the nano lipofilling and a satisfactory hair thickness is obtained after the transplantation (Figure 5).



Figure 5: 10 Days after hair transplantation - the grafts are visualized as maintained in the donor area.

Because linear scleroderma develops in young age and is located in the area of visible parts of the face, such as the forehead and scalp, patients are often looking for an esthetic correction. Presently, a number of different methods for correction of this deformation have been reported [5-10].

Milan and Bennett [5] make an excision of the affected skin and primarily close the defect. The resulting obvious scar is the main deficiency of this technique. Sengezer et al [6]. have used for the first time a bone graft for covering the defect of the forehead. We believe that the bone is not able to successfully imitate the skin due to its higher rigidity. Copcu introduces the use of porous polyethylene to correct linear scleroderma [7]. The potential for development of a “foreign body” reaction, the risk of infection and the price are the primary limitations for use of alloplastic materials. Nakahara and its team use tissue expanders to provide enough skin for closure of the defect after a resection of the lesion, thus achieving goods results [8]. Expanders, however, require a two-stage operation and time for hospitalization which increases the surgical risk. In order to avoid complex procedures as the abovementioned, minimally invasive methods have been offered as an alternative treatment – dermal fillers, lipofilling, nano lipofilling. Thareja et

al. uses hyaluronic acid, a soft tissue filler, for enlargement of the depressed scar in a patient with linear scleroderma [9]. All filling materials have certain deficiencies, including a high degree of resorption, multiple injections and additional expenses for the fillers. Another technology is the autologous transplantation of dermal fat which leaves minimal scars in the sites of the recipient and the donor and achieves satisfactory results [10].

All above listed techniques achieve filling up of the hypotrophic cicatrix but does not resolve the problem with the alopecia. Successfully performed hair transplantation procedures are described in the literature for its correction [11].

In addition to the quality filling up of the depression defect on the forehead and the scalp, nano lipofilling also provides a considerable improvement of the conditions for performance of the follicle transplantation. It is beneficial in two directions, apart from providing a better foundation for growing of the hair follicles; the injected fatty tissue is also rich in stem cells and growth factor, which have a favorable effect on the grafts. They result in an increase of the percentage of successfully implanted follicles [3].

In our opinion, the combination between nano lipofilling followed by a hair transplantation two months later is a good variant for correction of the hypotrophic cicatrix and the alopecia in patients with linear scleroderma. This will give a long-term and esthetically appropriate result in the treatment of scleroderma en coupe de sabre.

References

1. Adrienne N Choksi, Jeffrey S Orringer (2017) Linear Morphea-Induced Atrophy Treated with Hyaluronic Acid Filler Injections. *Dermatol Surg* 37: 1-4.
2. Park SW, Wang HY (2002) Survival of grafts in coup de sabre. *Dermatol Surg* 28: 763-766.
3. Piero Tesauro (2020) Hair Transplantation in Cicatricial Alopecia: The Role of Autologous Fat Transfer. *International Journal of Regenerative Medicine* 3: 1-11.
4. Tesauro P (2020) https://www.youtube.com/watch?v=xOtHT0Tdwxs&feature=emb_logo
5. Milan MF, Bennett JE (1983) Scleroderma En coup de sabre. *Ann Plast Surg* 10: 364-370.
6. Sengezer M, Deveci M, Selmanpakoglu N (1996) Repair of “coup de sabre,” a linear form of scleroderma. *Ann Plast Surg* 37: 428-432.
7. Copcu E (2004) Treatment of coup de sabre deformity with porous polyethylene implant. *Plast Reconstr Surg* 113: 758-759.
8. Nakahara M, Harii K, Yamada A, K Ueda, A Kajikawa (1991) Repair of “coup de sabre” with tissue expander. *Br J Plast Surg* 44: 575-578.
9. Thareja SK, Sadhwani D, Alan Fenske N (2015) En coup de sabre morphea treated with hyaluronic acid filler: report of a case and review of the literature. *Int J Dermatol* 54: 823-826.
10. Ensar Zafer Barin , Hakan Cinal , Mehmet Akif Cakmak ,

Onder Tan (2016) Treatment of Linear Scleroderma (en Coup de Sabre) With Dermal Fat Grafting. Journal of Cutaneous Medicine and Surgery 20: 269-271.

11. Kreuter A, Krieg T, Worm M, Jörg Wenzel, Pia Moinzadeh et al. (2016) German guidelines for the diagnosis and therapy of localized scleroderma. J Dtsch Dermatol Ges 14: 199-216.

Copyright: ©2021 Evgeni Sharkov, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.