

Inflammatory Alopecia: A Hidden Cause of an Announced Surgical Failure. The Importance of Koebner Phenomenon in Trichology

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Autografts of autologous hair is now an established practice for the treatment of people suffering from male and female Androgenetic Alopecia with an inadequate response to medical therapies or with no wish of getting any treatment at all. This is a short commentary to stimulate the attention of specialists who, during their professional activity, have undoubtedly noticed the existence of patients with poor results or even worsening of their clinical situation after surgical treatment. This would happen in 5% or even more of the cases followed in a long follow up, according to a short informal survey I conducted among well-known Italian colleagues experts in Hair transplantation. Surely these data should be definitely deepened.

Another field of application of this practice is represented by forms of scarring post-traumatic or post-inflammatory alopecia, but only where the underlying disease is settled - according to authoritative opinions - for at least 2-3 years [1]. Despite these precautions, the observation in some cases of reactivation of the disease after surgical excision or autografts, advises us to be extremely cautious in the treatment of patients with Discoid Lupus Erythematosus (DLE), Lichen Plano Pilaris (LPP) and Pseudopelade of Brocq (PP) (Figures 1,2,3). We recently suggested that this reactivation of the inflammatory process could be attributed to a true Koebner Phenomenon (KP) in which "Koebnerization" is inseparable from pathogenesis, treatment and prognosis of the original disease [2].

In 1872 Heinrich Koebner described a phenomenon he had observed which consisted of the following: physical trauma induced the formation of a characteristic of psoriatic lesions in a patient affected by psoriasis. Since then the term "Koebner Phenomenon" or "reactive isomorphism" has been utilized by the clinicians in other diseases which likewise present the formation of lesions of the underlying disease after trauma in the active forms of the diseases, where, a subclinical inflammation could be present also in normal appearing cutis [3].

We signalled Koebnerization in cases of LPP, DLE and also Alopecia Areata (AA) of the scalp [4]. We observed the classical reactivation of DLE after surgical exeresis of the bald patch [5], moreover we noted that the pathology was reactivated and widespread 3 weeks after a single session of cryotherapy. This also occurred after autologous hair grafting (micrografts), 4 weeks after transplant. In AA patches of alopecia may appear after obvious trauma such as being hit, burns, freezing, surgery, but also after prolonged microtrauma like in the cases we observed due to friction by clothing, glasses and buckles (Figure 4). As known, lichen ruber planus (LRP) is rarely found on the scalp, but typically presents the KP. Therefore LPP seems to have similar characteristics to LRP. Classically, the KP involves the epidermis, whereas in these cases damage was limited to the adnexial appendages.

The pathogenesis of KP is not entirely known. Toruniowa and Jablonska considered the mast cell (MC) as the element that triggers the KP in psoriasis [6]. We suggested that the MC could be a key cell also in the cases observed by us. In fact, in the initial phases of spontaneous and koebnerized AA and LPP there was an

evident intense degranulation of mast cells (Figure 5), even when the mononuclear infiltrate was scarce. The MC could initiate the lesions on the basis of its high sensitivity to changes in temperature, concentration of the electrolytes, variations of pressure and even alterations of electromagnetic fields, besides the well-known immunological activation via IgE, immunocomplexes, cytokines, and neuromediators like substance P and Corticotropin-Releasing Hormone CRH [7].

The identification of this phenomenon may explain why some treatments are inefficacious or even may worsen the clinical picture if used in the active phases of these hair diseases.

A frequent problem in Hair transplantation is the non-recognition of some forms of inflammatory alopecia such as "Frontal Fibrosing Alopecia (FFA)" or Fibrosing Alopecia in a Pattern Distribution (FAPD) (clinical less inflammatory variants of LPP) [8] (Figures 6,7,8), easily confused with the classic Androgenetic Alopecia (AGA) and so aggravated by surgical treatments by the KP for the same reason described above. Another option that leads almost exclusively to a failure intervention is the lack of recognition of specific clinical aspects of AA: "Androgenetic-like AA", "AA incognita", and some forms of Ophiasis (Figures 9,10,11)

All these forms can sometimes elude even the diagnosis of a specialist dermatologist, who has often to use imaging techniques such as dermoscopy (Figure 12) or histopathology to confirm the diagnosis [9].

Unfortunately, as previously stated, the same and apparent classic AGA sometimes can have disappointing results after a suitable surgical treatment. These findings could be explained on the basis of a Koebner-like Phenomenon for the presence of a subclinical perifollicular micro-inflammation, consisting of a lymphomononuclear infiltrate mostly localized around the Isthmus of the hair follicle, with increase in number and signs of mast cell activation [10-12] in about half of these subjects-male and female.

This follicular micro-inflammation would take a prognostic significance as, for example, a lower therapeutic response to minoxidil has been verified in subjects with male pattern alopecia [13]. Very important, without Biopsy, detection of peripilar signs (depression) through a normal Dermoscopy may be sufficient to identify these cases [14] (Figure 13).

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Figure 1: DLE: Koebnerization in the area of collection for autografts.



Figure 6: Fibrosing Frontal Alopecia – is the same patient of figure 7.



Figure 2: Pseudopelade: reactivation in the area of the grafts.



Figure 7: Fibrosing Alopecia in Pattern Distribution (FAPD): 15 years before it appeared clinically to my observation as a normal female pattern baldness.



Figure 3: Lichen Planus Pilaris -reactivation in the area of the grafts.



Figure 8: FAPD- treatment with finasteride -stabilization in 6 months.



Figure 4: Koebner phenomenon in AA: from trauma* and micro-trauma.

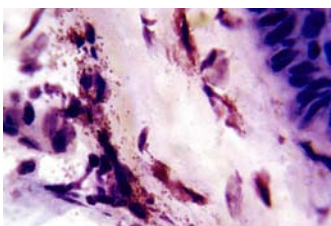


Figure 5: Perifollicular degranulating Mast Cells in the active phase of AA.



Figure 9: Alopecia Areata Androgenetica-like.



Figure 10: AA Androgenetica-like/Ophiasys – mistakenly treated with autografts, which have scarcely taken root.



Figure 11: Alopecia Areata incognita: wrong medical treatment.

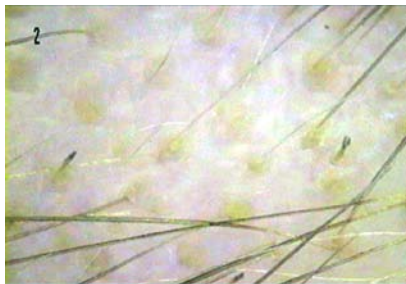


Figure 12: Yellow Dots, Typical of Alopecia Areata, in this case also associated with typical exclamation mark hair.

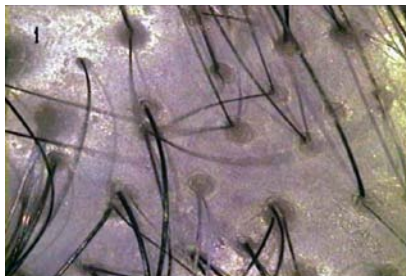


Figure 13: Peripilar signs. Are associated with an inflammatory infiltrate and perifollicular edema.

In some patients the inflammatory infiltrate has a lichenoid appearance and it is associated with fibrosis and atrophy of follicular structures, and thus assume a continuum between androgenetic forms and some lichenoid forms already mentioned [15,16,17],

where androgens could still play a role, given the relative effectiveness of the 5 α -reductase inhibitors -at least in the stabilization of the disease [17,18]. Interestingly, it was observed that transplantation of hair follicles from male and female human AGA on nude mice (immunologically incompetent) demonstrated a recovery of growth capacity equal or even superior to that of normal terminal hair [19]; a possible explanation of this phenomenon could be the resolution of perifollicular micro-inflammation and we therefore suggest to look more closely to inflammatory factors in triggering and maintenance of AGA. In particular an important role could be played by the fibrogenic cytokine TGF β , proved capable under androgenic stimulation to induce catagen in susceptible follicles [20] and notoriously critical factor in healing physiological and pathological processes [21]. Moreover, an improvement of AGA is observed after Chemotherapy and is perhaps associated with the same anti-inflammatory effect of some anticancer drugs [22]. We conclude therefore that a careful dermatological evaluation of these patients, with possible help of imaging studies and any concomitant pharmacological treatments may be helpful for reducing the risk of failure or poor cosmetic results of surgical treatment of alopecia, also by means of avoiding the possibility of a KP.

References

1. Ross EK, Tan E, Shapiro J (2005) Update on primary cicatricial alopecias. *J Am Acad Dermatol* 53: 1–37
2. Weiss G, Shemer A, Trau H (2002) The Koebner phenomenon: review of the literature. *J Eur Acad Dermatol Venereol* 16: 241-248
3. Placek W, Haftek M, Thivolet J (1988) Sequence of changes in psoriatic epidermis. Immunocompetent cell redistribution precedes altered expression of keratinocyte differentiation markers. *Acta Derm Venereol* 68: 369-367
4. d'Ovidio R, Claudatus J, Di Prima T. (2004) The Koebner Phenomenon in Trichology. *Journal of the European Academy of Dermatology and Venereology* 18: 239.
5. Callen JP (1979) Lupus erythematosus. In *Clinical Dermatology*. Demis Ed. Lippincot-Raven Pub-Philadelphia. Vol 1.1995. Sec 5.1, 1-28
6. Toruniowa B, Jablonska S (1988) Mast cells in the initial stages of psoriasis. *Arch Dermatol Res* 280: 189-193
7. Theoharis C, Theoharides (2002) Mast Cells and Stress—A Psychoneuroimmunological Perspective. *J Clin Psychopharmacol* 22: 103-108.
8. Harries MJ, Trueb RM, Tosti A, Messenger AG, Chaudhry I, et al. (2009) How not to get scar(r)ed: pointers to the correct diagnosis in patients with suspected primary cicatricial alopecia. *Br J Dermatol* 160: 482-501
9. Inui S (2011) Trichoscopy for common hair loss diseases: algorithmic method for diagnosis. *J Dermatol* 38: 71-75.
10. Sueki H, Stoudemayer T, Kligman AM, Murphy GF (1999) Quantitative and ultrastructural analysis of inflammatory infiltrates in male pattern alopecia. *Acta Derm Venereol* 79: 347-350.
11. Mahé, YF, Michelet, JF, Billoni, N, Jarrousse F, Buan B, et al. (2000) Androgenetic alopecia and microinflammation. *Int J Dermatol* 39: 576–584
12. Won CH, Kwon OS, Kim YK, Kang YJ, Kim BJ, et al. (2008) Dermal fibrosis in male pattern hair loss: a suggestive implication of mast cells. *Arch Dermatol Res* 300: 147-152.
13. Whiting DA (1993) Diagnostic and predictive value of horizontal sections of scalp biopsy specimens in male pattern androgenetic alopecia. *J Am Acad Dermatol* 28: 755-763.
14. Deloche C, de Lacharrière O, Misciali C, Piraccini BM, Vincenzi C, et al. (2004) Histological features of peripilar signs associated with androgenetic alopecia. *Arch Dermatol Res* 295: 422-428
15. Rashid RM, Thomas V (2010) Androgenic pattern presentation of scarring and inflammatory alopecia. *J Eur Acad Dermatol Venereol* 24: 979-980.

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16. Zinkernagel MS, Trüeb RM (2000) Fibrosing alopecia in a pattern distribution: patterned lichen planopilaris or androgenetic alopecia with a lichenoid tissue reaction pattern? *Arch Dermatol* 136: 205-211.
 17. Olsen EA (2005) Female pattern hair loss and its relationship to permanent / cicatricial alopecia: a new perspective. *J Investig Dermatol Symp Proc* 10: 217-221.
 18. Georgala S, Katoulis AC, Befon A, Danopoulou I, Georgala C (2009) Treatment of postmenopausal frontal fibrosing alopecia with oral dutasteride. *J Am Acad Dermatol* 61: 157-158.
 19. Krajcik RA, Vogelman JH, Malloy VL, Orentreich N (2003) Transplants from balding and hairy androgenetic alopecia scalp regrow hair comparably well on immunodeficient mice. *J Am Acad Dermatol* 48: 752-759.
 20. Itami S, Inui S (2005) Role of androgen in mesenchymal epithelial interactions in human hair follicle. *J Investig Dermatol Symp Proc* 10: 209-211.
 21. Branton MH, Kopp JB (1999) TGF-beta and fibrosis. *Microbes Infect* 1: 1349-1365.
 22. Read W (2010) Baldness reversed by chemotherapy. *J Am Acad Dermatol* 63: 727-728.