Correspondence

Alopecia areata following COVID-19 vaccination: vaccine-induced autoimmunity?

Dear Editor,

We report a case of an 80-year-old man who came to our attention for a rapidly progressive loss of facial hair 7 days after the administration of the first dose of the BNT162b2 vaccine, an mRNA vaccine against SARS-CoV-2. He had no personal or family history of alopecia or autoimmunity. Before the vaccination, a COVID-19 serological test and a naso-oropharyngeal swab test gave a negative result. During the visit, we found an area of beard hair loss on the left cheek and the upper lip with a concomitant widespread involvement of the entire scalp, with a SALT score of 65% (Fig. 1a-b); no other areas were involved. A pull test gave a positive result, and cadaveric and exclamation point hairs were noted upon trichoscopy (Fig. 1c), allowing the diagnosis of alopecia areata (AA). No improvement was seen after topical application of clobetasol foam; indeed, the patient reported a progressive worsening of the condition after the second dose of the vaccine. At the 2-month follow-up visit, we observed alopecia areata totalis (Fig. 1d) and started a topical immunotherapy with squaric acid dibutylester combined with topical 5% minoxidil. At the last follow-up visit, 1 month from the start of immunotherapy, no improvement was noted.

AA is an autoimmune disease that leads to non-scarring hair loss. Although its pathogenesis is complex, the most accredited theory supports the role of hair bulb inflammation and the loss of hair follicle immune privilege.[1] While genetic predisposition contributes to AA, as shown by familial studies, environmental factors, such as infectious agents, psychological stress, diet, drugs, and also vaccines, can act as triggers.[2]

Intriguingly, a strong link between particular vaccines and autoimmune diseases has been established only in few cases. In the literature, there are some reports of AA occurring after the administration of different vaccines including hepatitis B virus, herpes zoster virus, *Clostridium tetani*, Japanese encephalitis, and human papillomavirus, perhaps due to a hypersensitive reaction in genetically predisposed individuals.[2,3] To our knowledge, only four cases of AA arising after the COVID-19 vaccination were described in literature[4,5]; three of them were associated with the AZD1222/ChAdOx1 vaccine and one with the BNT162b2 vaccine; all occurred in patients with a previous history of AA. We do not exclude the possibility that

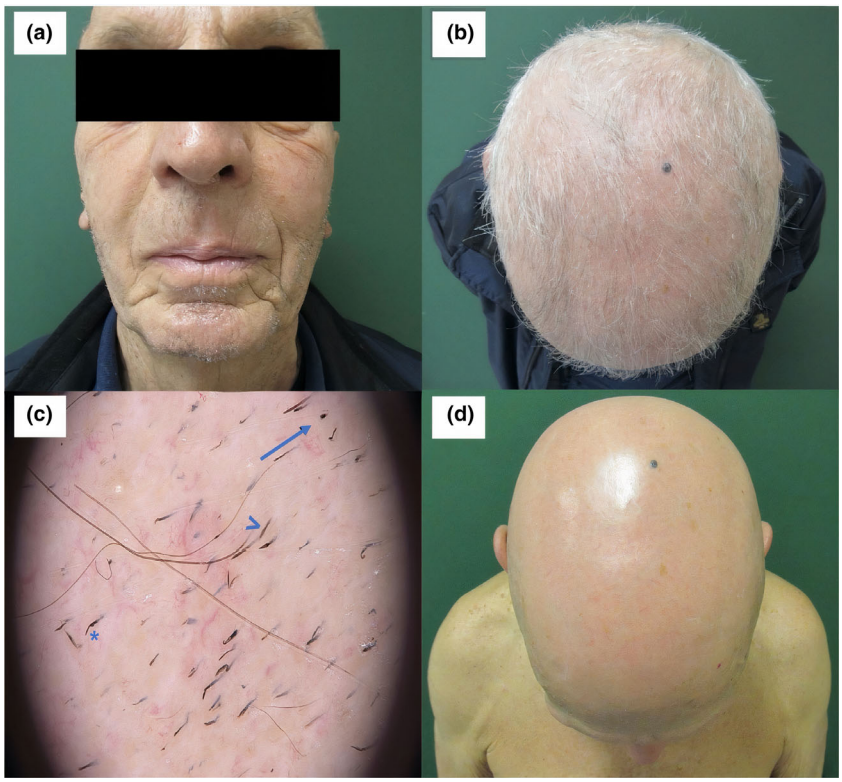

Figure 1 Clinical features and trichoscopy. (a, b). Patches of alopecia areata of the beard and diffuse hair loss covering the entire scalp 7 days after the administration of the first dose of the BNT162b2 vaccine. (c). Trichoscopy: exclamation point hairs (arrowhead), broken hairs (asterisk), and cadaveric hair (arrow). (d) Two-month follow-up visit: alopecia areata totalis after the second dose of the vaccine

our patient had a previous undiagnosed patch of AA, in accordance with the previous reports.

The timing of our case strongly suggests a potential connection between the administration of the BNT162b2 vaccine and the appearance of widespread AA. In our view, this seems to corroborate the hypothesis that vaccination can trigger an autoimmune response in predisposed individuals. Indeed, we know that infections can induce autoimmunity in genetically predisposed individuals by altering immune homeostasis so that immune regulatory mechanisms fail to suppress the hyperactivation.[3] If we consider how vaccination works and the similarities with an infection, it seems logical for us to postulate a similar mechanism occurring here. The first dose may have triggered the autoimmune response, while the second, as performed on an already sensitized immune system, may have boosted the autoimmune attack on the hair bulb, leading to a marked worsening of the condition. Our report does not allow any firm conclusions to be drawn, but it represents a starting point for future studies for an adequate evaluation on this current topic of primary importance.

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The patient in this manuscript has given written informed consent to publication of his case details, including photographic documentation.

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