Dermatology Practical & Conceptual

Square-shaped Alopecia After Embolization of Intracranial Aneurysm: a Case Report and Review

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Introduction

Endovascular interventional procedures are widely used for intracranial arterial pathologies treatment. They require realization of fluoroscopy, a technique that relies on X-rays to obtain real-time images [1]. Many cases of transient alopecia after this procedure have been reported.

Case Presentation

A 45-year-old male was admitted with an intracranial hemorrhage after a rupture of an aneurysm in the anterior communicating artery. Two embolization procedures were required. After 2 weeks, he experienced a partial hair loss, comprising the left temporoparietal scalp region. A 7,5-cm sized alopecia plaque with angular edges and rectangular morphology was observed (Figure 1). Pull test was positive. Trichoscopy showed black dots and short vellus hairs (Figure 2). Lack of peladic hairs ruled out alopecia areata. Skin biopsy revealed multiple pilosebaceous units with obliterated follicles without signs of fibrosis. After 2 months the patient showed complete hair regrowth without treatment.

Conclusions

Transient radiation alopecia (TRA) is an adverse effect, which usually appears with accumulated doses between 3-6 Gy. Greater doses than 6 Gy may cause scarring alopecia [1,2]. This is caused by the simultaneous entry of multiple follicular cells in catagen phase. The dose of radiation produced by a fluoroscopy unit is usually between 0.02-0.05 Gy/min.

Fifty-eight cases of TRA have been reported after intracranial arterial embolization, being more frequent in women, with a ratio of 1.41:1. The age varies from 13 years to 70 years, but most of the patients were between 30-50 years. Patients report sudden hair loss, producing plaques of alopecia whose size and shape vary depending on the model of the device used. The characteristic angular edges and the medical history are essential for the differential diagnosis with alopecia areata [1,2].

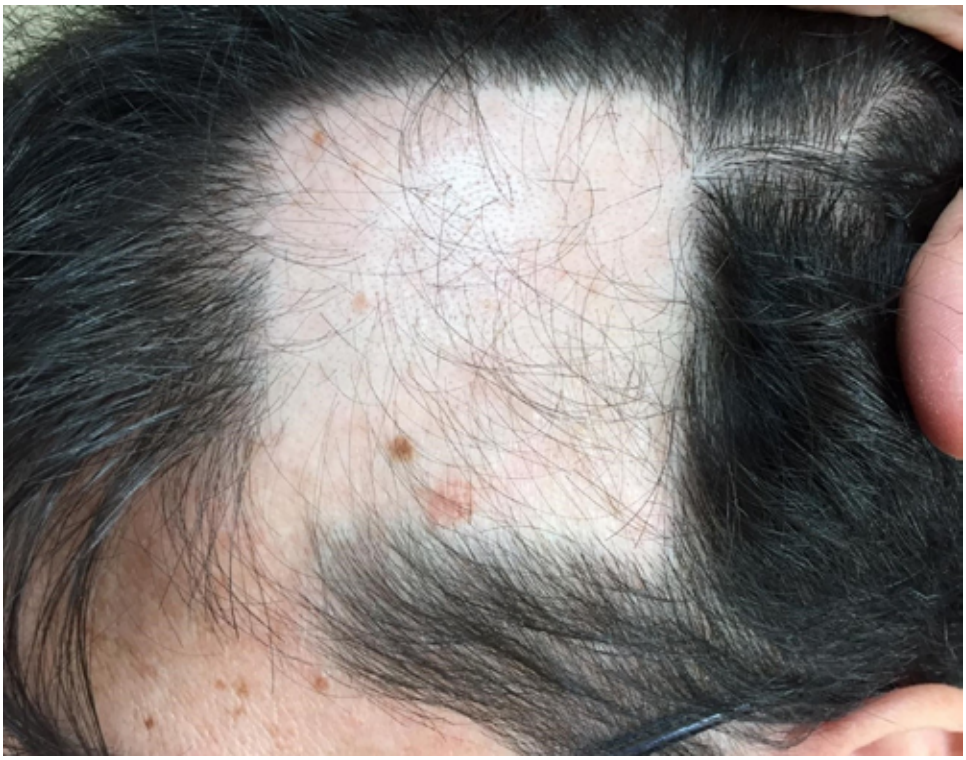

Figure 1. Alopecia area in the patient left temporoparietal region. Note the angular edges which give it a perfectly square contour.

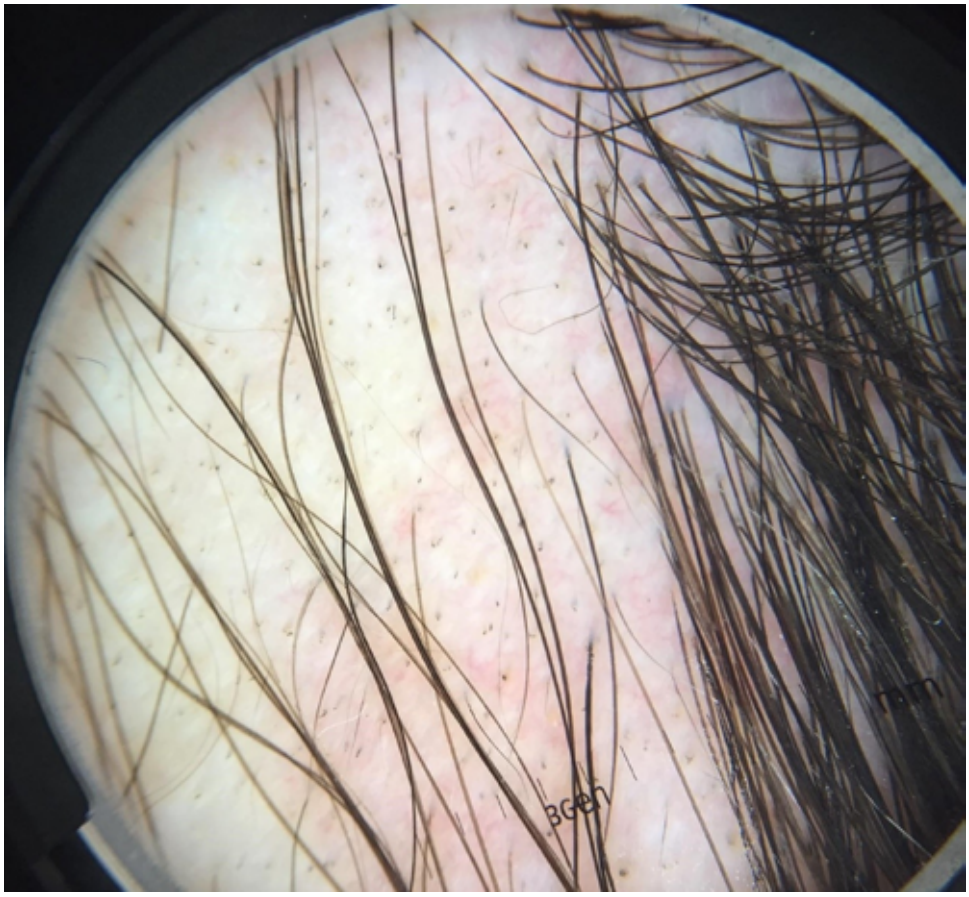

Figure 2. Trichoscopy performed on the edge of the alopecia area. Black dots can be observed, as well as short vellus hair.

The cumulative radiation dose was in most cases greater than 3 Gy, with 92% of cases ranging between 3-6 Gy [1]. Only one case of scarring TRA has been reported [2]. In the case of our patient, we do not know the exact dose of radiation received, but a total dose greater than 3 Gy was estimated.

In trichoscopy, the most common findings include black dots and yellow dots, followed by short, vellus hairs. Broken hairs and white dots are less common [2]. These findings can be observed in alopecia areata. However, exclamation hairs are often seen in the latter, a finding that is not present in TRA.

Histological findings show anagen or catagen follicles lacking inflammatory infiltrate or scar tissue [2]. Differential diagnosis should be made mainly with alopecia areata, in which a peri- or intra-bulbar lymphocytic infiltrate with a "honey-comb" image is usually observed.

Time from the embolization procedure to the onset of alopecia ranges from 1-8 weeks. Most cases spontaneously resolve between 2-6 months, with complete regrowth. In some cases, cryotherapy, topical corticosteroids, topical minoxidil and/or intralesional triamcinolone were applied, without significant differences compared to untreated patients [2].

TRA is a transient condition that resolves without the need of treatment. Given the increase of such interventional procedures in recent years, it is important to know this entity and differentiate it mainly from alopecia areata. It should also be considered adding this side effect to the informed consent of such interventions.

References

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