A Case of Transient Rectangular Alopecia After Aneurysm Embolization

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To the Editor:

Endovascular procedures are now widespread in vascular interventional neuroradiology, but there are very few reports of their cutaneous adverse effects in the literature; such effects are typically poorly recognized and are underdiagnosed. Transient rectangular alopecia, considered to be a subtype of radiodermatitis, is a condition that has been known to dermatologists for only about 10 years, and scarcely 10 cases have been published.

We report the case of a 39-year-old man, with no past history of interest, who presented with oppressive, left frontal headaches that had started 2 months earlier, were refractory to multiple treatments, and were associated with ipsilateral, retro-ocular symptoms; the rest of the neurological examination was normal. Magnetic resonance imaging revealed a giant fusiform aneurysm of the middle cerebral artery (Figure 1), and it was therefore decided to perform embolization using a 3-dimensional Guglielmi detachable coil (platinum spiral) (Matrix2). The angiographic procedure was performed in 2 sessions separated by 5 days, taking a series of 12 digital subtraction images in the first session and 20 in the second. Total fluoroscopy time was of 90 to 100 minutes and the approximate total dose was of 3 Gy. The principal planes used were the posteroanterior and left-right oblique. On completion of the procedure, a clot developed around the spiral, blocking the lumen of the aneurysm (Figures 2 and 3). The patient's headaches improved, but 2 weeks later he came to the dermatology outpatient clinic for a rectangular, left parieto-occipital plaque of alopecia with no signs of inflammation (Figure 4). There were no exclamation mark hairs and the hair pull test was strongly positive. The condition progressed to complete alopecia in that area. The superficial arterial pulses were present bilaterally and the blood tests were normal. As the plaque was situated in the area of maximum radiation, we related it to the endovascular procedure and therefore prescribed no treatment, performing follow-up on a monthly basis to evaluate the clinical course. Complete repopulation had occurred after 5 months.

Alopecia after radiotherapy to the head and neck is reported extensively in the literature; however, there are very few reports of alopecia after diagnostic and therapeutic endovascular procedures and it is underdiagnosed. It is considered to be a subtype of radiodermatitis caused by the marked radiosensitivity of hair follicles in anagen.[1]

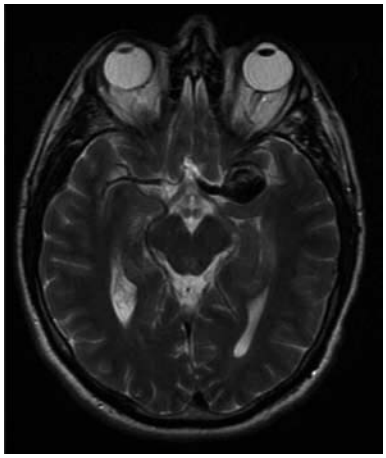

Figure 1. Absence of signal on the magnetic resonance image in the area of the left middle cerebral artery. Giant fusiform aneurysm (2.5 cm).

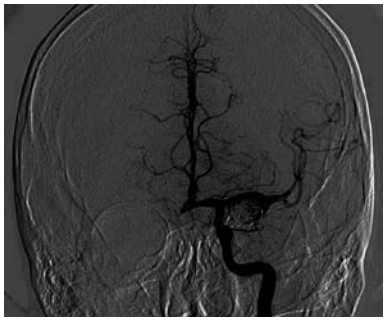

Figure 2. Formation of a coagulum around the spiral, leading to occlusion of the lumen of the aneurysm.

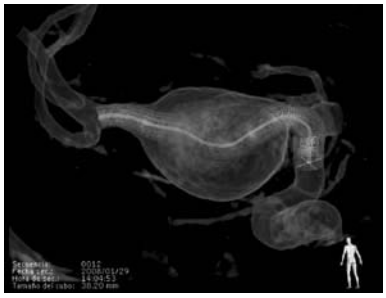

Figure 3. Three-dimensional image showing the Enterprise endovascular prosthesis and the Matrix2 spiral, which produced occlusion of the aneurysm by the formation of a coagulum and fibrosis.

Onset usually occurs 2 to 3 weeks after embolization, and it is most common in cases of large, complex vascular disorders,[2] or ruptured lesions.[3] It may be the only manifestation of the adverse effects of the radiation, or it may be associated with other symptoms, which are usually neurological.[4] There is a series of factors associated with a

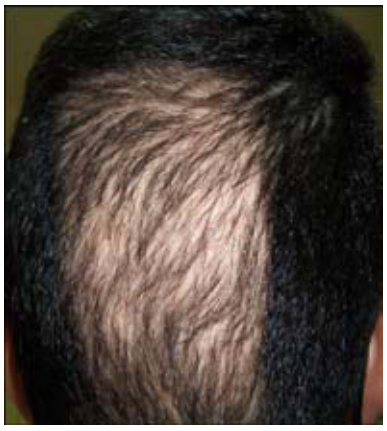

Figure 4. Rectangular plaque of alopecia in the left parieto-occipital area.

higher probability of the onset of this type of alopecia,[5] including total fluoroscopy time (more than 100 minutes), total dose received (cicatricial alopecia if the dose is over 7 Gy, transient with doses between 3 and 5 Gy), predominant area of radiation, and biologic factors (age, oxygen level, hair density, hormonal status, genetic factors, ethnic differences, etc).

The main differential diagnoses are pressure alopecia,[6] due to hypoxia and associated with long periods of general anesthesia (more than 4 hours), and alopecia areata.[7]

Postembolization alopecia does not require treatment, as repopulation occurs spontaneously after a mean time of 12 to 14 weeks. The only method of prevention is to monitor the radiation dose during angiography. A recently published study investigated this condition in 103 patients.[8] It was found that the percentage of adverse effect was undetectable if the different parameters evaluated—cumulative cutaneous dose during endovascular embolization, total fluoroscopy time, total cumulative dose, and number of series of digital subtraction images—did not exceed a certain threshold. It is therefore very important for interventional radiology departments to establish a series measures to avoid these undesirable effects.

This type of alopecia was first described in 1994 in a radiology journal,[9] and it was not until 1998 that it was first published in a dermatology journal, *Hautarzt*, by the group of the German investigator Krasovec.[10] A year later, Tosti et al[7] published a further 3 cases. Since then, only about 10 cases have been published in journals of dermatologic interest, the last in 2008,[11] making it a condition that appears to be known better by neuroradiologists and neurosurgeons than by dermatologists.

We can affirm that transient alopecia after embolization is a rare and little-known phenomenon. However, due to the increase in minimally invasive endovascular procedures for the diagnosis and treatment of vascular disorders, its incidence may rise. Because of this, patients should be informed and the disorder should be included in the list of possible complications of this technique, together with the local, systemic, and cerebral adverse effects already listed.

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Conflicts of Interest

The authors declare no conflicts of interest.

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