therapeutic conduct of the studied cases; effective participation in research orientation; critical review of the manuscript.

Renato Shintani Hikawa: Approval of the final version of the manuscript; collection, analysis and interpretation of data; design and planning of the study; intellectual participation in propaedeutic and/or therapeutic conduct of studied cases; effective participation in research orientation; critical review of the manuscript.

## Conflicts of interest

None declared.

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## References

1. Smith NP, Jones WE. Multinucleate cell angiohistiocytoma – a new entity. Br J Dermatol. 1985;113:5.
2. Jia QN, Qiao J, Qu T. Generalized multinucleate cell angiohistiocytoma with possible origin from fibroblasts: a clinicopathological study of 15 cases. J Dermatol. 2021;48:114–9.
3. Wang M, Abdul-Fattah B, Wang C, Zhao Y, Qu X, Al-Muriesh M, et al. Generalized multinucleate cell angiohistiocytoma: case report and literature review. J Cutan Pathol. 2017;44:125–34.
4. Frew JW. Multinucleate cell angiohistiocytoma: clinicopathological correlation of 142 cases with insights into etiology and pathogenesis. Am J Dermatopathol. 2015;37:222–8.
5. Wilson JE, Cerio R, Smith NP. Multinucleate cell angiohistiocytoma: an acquired vascular anomaly to be distinguished from Kaposi's sarcoma. Br J Dermatol. 1990;122:651–63.
6. Cesinaro AM, Roncati L, Maiorana A. Estrogen receptor alpha overexpression in multinucleate cell angiohistiocytoma: new insights into the pathogenesis of a reactive process. Am J Dermatopathol. 2010;32:655–9.
7. Doshi-Chougule BN, Gust A, Mentzel T, Böer-Auer A. Multinucleate cell angiohistiocytoma with hypertrophic nerves. J Cutan Pathol. 2013;40:1048–53.
8. Valerón-Almazán P, Dehesa L, Santana N, Vilar J, Carretero G. Dermoscopic features of multinucleate cell angiohistiocytoma: a variant of dermatofibroma? Actas Dermosifiliogr. 2011;102:69–71.
9. Roy SF, Dong D, Myung P, McNiff JM. Multinucleate cell angiohistiocytoma: a clinicopathologic study of 62 cases and proposed diagnostic criteria. J Cutan Pathol. 2019;46:563–9.
10. Moradi Tuchayi S, Garibyan L, Lee KC. Successful treatment of multinucleate cell angiohistiocytoma with fractionated ablative CO2 laser. JAAD Case Rep. 2019;5:297–9.

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# Sarcoid reaction in eyebrow tattooing: a complication of a common cosmetic procedure☆

*Dear Editor,*

In the last decades, facial pigmentation techniques for aesthetic purposes have become common. Among them is eyebrow tattooing or micropigmentation. Unlike traditional tattoos, in which the pigment is deposited in the deeper layers of the dermis, in micropigmentation, the semi-permanent pigment is deposited in the upper layer of the dermis. Adverse reactions to this technique include infection, contact dermatitis, granulomatous reactions, and Koebner phenomenon.[1]

A 30-year-old female patient, with a history of previous bariatric surgery, without other comorbidities, complained of raised eyebrows for three months. She had repeatedly undergone micropigmentation of the region over the past four years, the last being 14 months before. She denied any systemic symptoms. On examination, she had raised plaques on the topography of the eyebrows, especially on the right, in addition to areas of alopecia (Fig. 1A). At dermoscopy, homogeneous orange-brown areas and rarefied hairs were seen (Fig. 2). The remainder of the physical examination was normal. Complementary tests including serum calcium level, electrocardiogram, chest X-ray, serum protein electrophoresis, and tuberculin skin test were normal.

Histopathology showed non-caseating chronic granulomatous dermatitis with a sarcoid pattern (Fig. 3); acid-fast bacillus (AFB) and fungal tests were negative. With the diagnosis of sarcoid reaction secondary to the tattooing of the eyebrows, therapy with doxycycline 100 mg/day and fludroxycortide occlusive treatment was performed for 15 days. The patient missed the reassessment appointment and returned after three months with complete regression of the

☆ Study conducted at the Sanitary Dermatology Outpatient Clinic, Secretaria de Saúde do Estado do Rio Grande do Sul, Porto Alegre, RS, Brazil.

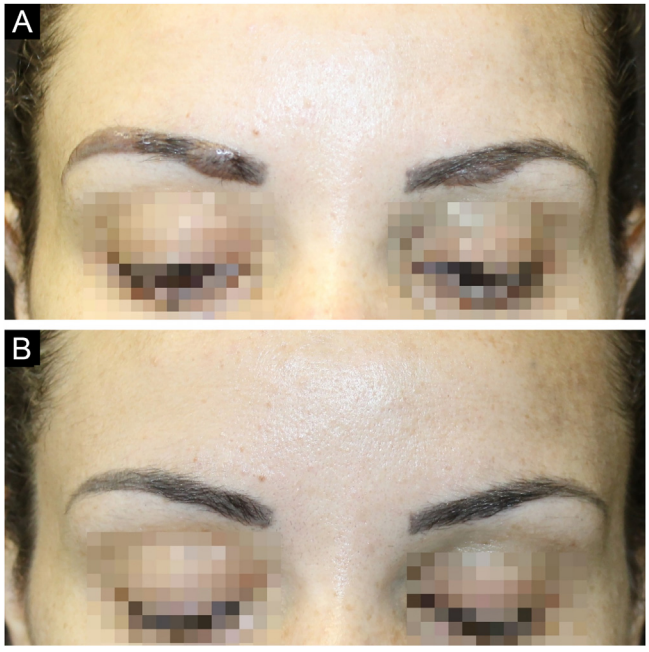


**Figure 1** (A) Infiltrated and well-defined plaques on the topography of both eyebrows; rarefied hairs. (B) Complete regression of the lesions with eyebrow regrowth

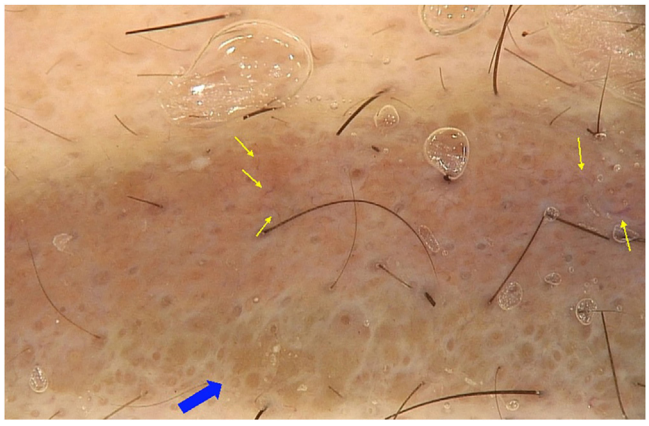

**Figure 2** Dermoscopy (×20) showing area of homogeneous orange-brown color and rarefied hairs (blue arrow) and linear vessels (yellow arrows)

lesions (Fig. 1B). She was advised not to repeat the procedure.

Micropigmentation is normally performed with a portable tattoo pen, which is smaller than the traditional tattoo device. Ready-made paints are available on the market, but some professionals make their own mixtures. Pigment washout may occur during the first few days of healing, then the remaining pigment particles are stored in dermal macrophages and fibroblasts.[2,3]

Sarcoid granulomas can develop in areas of tattooing or permanent makeup as isolated reactions or as part of systemic sarcoidosis. The time between the tattoing and the reaction onset is variable, and there may be a long latency period, justifying the investigation of systemic sarcoidosis.[1,2]

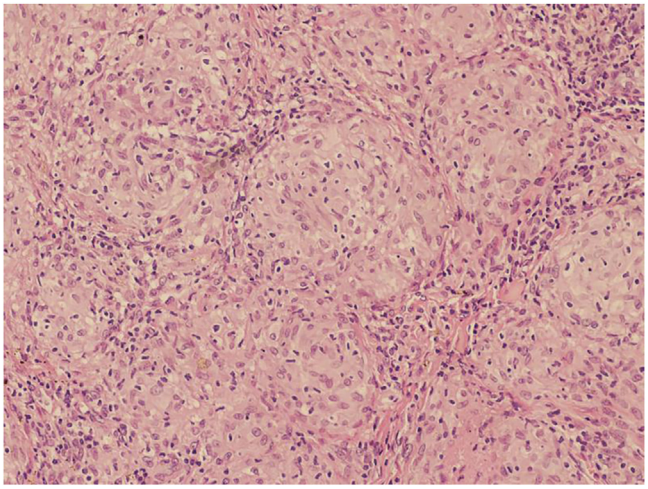

**Figure 3** Histopathology showing non-caseating granulomas with a sarcoid pattern (Hematoxylin & eosin, ×50)

Topical and intralesional corticosteroids are the first line of treatment.[1] Studies suggest that tetracyclines inhibit granuloma formation, and their role in the treatment of sarcoid reactions has been documented.[4] There are also reports of systemic treatment with allopurinol and antimalarials.[5] The patient had an excellent response after a short period of treatment with occlusive corticosteroids associated with doxycycline, with no lesion recurrence to date.

While numerous cases of sarcoid granulomas have been reported in body tattoos, few have been related to eyebrow micropigmentation. With the greater prevalence of this cosmetic technique, it is important to recognize the possible adverse reactions, as well as the adequate management. Moreover, it is crucial to remember the importance of investigating systemic sarcoidosis in these patients.

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## Authors' contributions

Tamires Ferri Macedo: Approval of the final version of the manuscript; drafting and editing of the manuscript; collection, analysis, and interpretation of data; critical review of the literature.

Simone Perazzoli: approval of the final version of the manuscript; drafting and editing of the manuscript; collection, analysis, and interpretation of data; critical review of the literature.

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## Conflicts of interest

None declared.

## References


1. Islam PS, Chang C, Selmi C, Generali E, Huntley A, Teuber SS, et al. Medical complications of tattoos: a comprehensive review. Clin Rev Allergy Immunol. 2016;50:273–86.
2. Simunovic C, Shinohara MM. Complications of decorative tattoos: recognition and management. Am J Clin Dermatol. 2014;15:525–36.
3. De Cuyper C. Complications of cosmetic tattoos. Curr Probl Dermatol. 2015;48:61–70.
4. Monk E, Shalita A, Siegel DM. Clinical applications of non-antimicrobial tetracyclines in dermatology. Pharmacol Res. 2011;63:130–45.
5. Valbuena MC, Sánchez L, Franco VE, Jiménez HD. Sarcoid granulomatous reaction in tattoos: report of two cases. An Bras Dermatol. 2017;92:129–32.



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# Segmental hypopigmented acneiform nevus with *FGFR2* gene mutation☆

*Dear Editor,*

Segmental acneiform nevus associated with mutations of Fibroblast Growth Factor Receptor 2 (*FGFR2*) was first reported by Munro and Wilkie.[1] Very few similar cases were reported under different names making this disorder confusing. Here, the authors report a new case with a missense mutation in the *FGFR2* gene and summarized the features of this specific entity.

A 13-year-old Chinese boy presented with a segmental hypopigmented patch on his left abdomen and back following the Blaschko line since birth. Since the age of 10, comedones, scattered red papules, pustules, and nodules developed on the hypopigmented patch (Fig. 1A-B). Dilated follicular ostia with keratin plug, less pigmented terminal hairs with abnormal curled growth pattern, and follicle-centered hypomelanosis were identified under the Dermoscopy examination (Fig. 1C). During early childhood the patient had a minor delay in mental development and an attention deficit disorder, but no solid evidence of mental deficiency was found when he presented. The patient's general health status, magnetic resonance imaging scan, skeletal X-Ray, and routine laboratory examinations were normal. Their family history was unremarkable.

Venous blood was taken from the patient and his parents, and skin biopsies from the lesional and normal skin of the patient were performed. Histological examination showed dilated plugged follicular infundibula and perifollicular lymphohistiocytic infiltrate (Fig. 1D). Sanger sequencing of *FGFR2* (NM_022970) detected the heterozygous mutation c.758C>G in exon 7 in the affected skin (Fig. 1E) which was neither present in unaffected skin nor in the lymphocytes from him and his parents. The sequence alteration represents a somatic mosaic mutation leading to a Pro253Arg amino acid change (CCT253CGT).

Few similar cases have been reported under different names (Table 1). A patient with mosaic *FGFR2* mutation (p.Ser252Trp) showed similar clinical symptoms.[2] Kiritsi et al.[3] reported a severe case in a patient presenting with multiple segments involved. Ma et al.[4] described a similar case but not confirmed by gene investigation. In addition, some documented nevus comedonicus cases with hypopigmentation may be the same disease.[5]

Acneiform lesions are the primary feature of this entity. *FGFR2* mutation in keratinocytes could induce the hypercornification of the pilosebaceous duct and inflammatory response.[2] The p.Pro253Arg mutation is located in the highly conserved linker region of *FGFR2* and leads to ligand-dependent *FGFR2* activation *in vivo* due to a conformational change that increases ligand-binding affinity.[3] Extensive acneiform lesions, and depigmentation of hair, skin and eyes have been described in Apert syndrome in which two-thirds of patients exhibit a germline *FGFR2* mutation.[6] The acneiform lesions responded to treatment with isotretinoin 20 mg daily like those in Apert syndrome.[3,6]

The presence of early-onset hypopigmentation is another persistent characteristic feature reported in almost all published cases except the first case in which whether there was pigmentation change was not mentioned. It could be caused by the failure of melanosome transfer from melanocytes to keratinocytes or by elevated IL-1$\alpha$-mediated postinflammatory hypopigmentation.[2]

Based on clinical and molecular data of these published cases, here, the authors propose that 'segmental hypopigmented acneiform nevus with *FGFR2* mutation' might be a more comprehensive description for this specific entity. In addition, the authors suggest any atypical nevus comedonicus with a feature of hypopigmentation and/or inflammatory lesion should consider this disorder and bear in mind that postzygotic mosaicism for a genetic disease such as Apert syndrome can also affect the gonads, thus resulting in a risk of transmission to offspring.[6]

☆ Study conducted at the Shanghai General Hospital, Shanghai, China.