



## Periocular subcutaneous granuloma annulare in a child: A case report

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### ABSTRACT

**Purpose:** We describe a rare case of annular granuloma involving the eyelid of a child, a 6-year-old male, who presented with multiple subcutaneous nodular lesions involving the upper eyelid of the right eye.

**Observations:** The slit-lamp examination of the eye was normal. Extra-ocular examination showed a lesion on the dorsal aspect of the right foot, which was resistant to treatment with topical corticosteroids. He underwent surgical excision of the eyelid nodules under general anesthesia. Histopathology with immunohistochemical staining of the excisional biopsy confirmed the diagnosis of annular granuloma, with positive Vimentin and CD68 stains in many palisading histiocytic cells, while Factor VIIIa, S100, and CD1a were negative. Tuberculosis was ruled out by negative Ziehl-Neelsen staining for acid-fast bacilli.

**Conclusions and importance:** This idiopathic granulomatous condition proved to be a benign, self-limiting cutaneous disease that can regress spontaneously. It affects the skin of the foot in more than 70% of all patients; however, involvement of the eyelid is extremely rare. We report this case to highlight such a rare entity and increase awareness regarding this dermatological condition among ophthalmologists.

### 1. Introduction

Granuloma annulare (GA) is an idiopathic, benign dermatosis that is usually seen in healthy children but can occur at any age, most frequently on the trunk and extremities, rarely in the face.<sup>1</sup> It appears as firm, skin-colored papules, plaques, or nodules, organized in a classic annular pattern.<sup>1</sup> However in the periocular region of the face, the annular pattern is generally not present, which makes the diagnosis challenging.<sup>1</sup> These lesions typically present in the eyelids as multiple papules that are firm, non-tender, nonpruritic, and of variable mobility.<sup>2</sup> Histological examination usually confirms the diagnosis. It is characterized by collagen necrobiosis with palisading histiocytes, surrounding a central mucin core.<sup>3</sup> GA lesions are self-limiting yet tend to multiply, increase in size, and may recur. With time, spontaneous regression partially or entirely can occur, even without treatment. Due to the unusual presentation and rarity of this lesion in the periocular area, ophthalmologists are not usually familiar with it, and treatment recommendations available in the literature are limited.<sup>3,4</sup> We report our experience with the management of GA lesions that presented on the eyelid of a 6-year-old boy. Upon reviewing the literature, we found few

published cases of pediatric periocular granuloma annulare. Thus far, none were from Saudi Arabia.

### 2. Case report

A 6-year-old boy presented to the oculoplastic clinic at Dhahran Eye Specialist Hospital (DESH) with a 1-year history of multiple nodules on the upper eyelid of the right eye. He was otherwise healthy. Family history was not significant. There was no history of insect bite, trauma, or recent vaccination. Also, no recent travel or exposure to a sick patient was reported.

On examination, we found multiple subcutaneous, skin-colored, nodular lesions measuring between 1 and 4 mm in size, involving the upper and lower eyelids of the right eye (Fig. 1). Otherwise, the ocular examination was normal. Additionally, we found on cutaneous examination two raised reddish lesions arranged in a ring-like fashion measuring approximately 4 × 3 cm over the dorsal aspect of the right foot and a similar minor lesion over the right ankle (Fig. 2). He underwent surgical excision of the prominent eyelid nodules through a lid crease incision on the right upper eyelid under general anesthesia. The

; GA, Granulomaannulare.

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**Fig. 1.** Multiple subcutaneous, skin-colored, nodular lesions involving the upper and lower eyelids of the right eye. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



**Fig. 2.** Right ankle lesions were distributed in a ring-like manner.

nodules were subcutaneous, had an ill-defined shape with whitish, firm, and fibrotic-like contents.

Histopathology of the excisional biopsy showed palisading histiocytic cells surrounding the granuloma (Fig. 3); and revealed expression of vimentin and CD68 (Fig. 4), while factor XIIIa, S100, and CD1a were negative. In addition, the necrobiotic collagenolytic center of the granuloma contained Alcian Blue positive material (Fig. 5). Tuberculosis was ruled out by a negative Ziehl-Neelsen stain for acid-fast bacilli, and fungal stains were non-contributory. Sarcoidosis was ruled out by a pediatric rheumatologist after necessary investigations turned out negative. Based on clinical, microscopic, and immunohistochemical findings, the diagnosis of granuloma annulare was made.

The patient was discharged on tobramycin/dexamethasone ointment and referred to a dermatologist for follow-up of the foot lesions. The dermatologist prescribed topical corticosteroids as well. Two weeks later, the patient was seen and demonstrated excellent eyelid healing. However, some lesions started to regrow after three months, though they were small, and none reached the initial preoperative size. One year later, the lesions did not advance in size. During the last follow-up, three

years post excision, the eyelid lesions completely resolved, while the lesions on the foot regressed to tiny, skin-colored, shiny papules (Fig. 6).

### 3. Discussion

Granuloma annulare (GA) is an inflammatory dermatosis characterized by annular groups of skin-colored to erythematous papules or nodules.<sup>5</sup> It was described as early as 1895 as ‘ringed eruption of the fingers’ in an 11-year-old girl.<sup>6</sup> Typical skin sites include the dorsa of hands or feet, upper and lower extremities, and trunk, and, rarely the scalp and periocular region.<sup>4</sup> Four main clinical variants of GA are known: localized GA (multiple or single), subcutaneous GA, generalized GA (annular or nonannular), and perforating GA.<sup>5</sup>

Our case of an otherwise healthy 6-year-old boy, demonstrates the typical demographics of localized GA which usually affects school-age children, but it can occur at any age.<sup>5</sup> Generally there is no sex predilection however, a slight male predilection has been reported in children with localized GA, while female predilection is found in adults.<sup>7</sup> There was no impact of ethnicity on disease prevalence, except for pediatric periocular localized GA, which was found to be common in the African American population.<sup>2</sup>

The etiology remains unclear, although delayed-type hypersensitivity reaction has been speculated.<sup>7</sup> This could be triggered by insect bites and other nonspecific minor local traumas, immunization, herpes zoster virus infection, and other infections.<sup>5</sup> In recent reports, GA was significantly associated with autoimmune disease, diabetes mellitus, and hyperlipidemia.<sup>8,9</sup> Some authors reported uveitis in pediatric patients with subcutaneous GA; still, no significant statistical association with uveitis has been confirmed.<sup>2</sup> A complete ophthalmological evaluation was performed for our patient, and it was normal.

Histopathology for this condition classically shows a granulomatous core of necrobiotic collagenous fragments encompassed by palisading histiocytes, usually without multinucleated giant cells, as confirmed by Colloidal Iron or Alcian Blue staining.<sup>1,4</sup> If the granulomatous inflammation appears with a non-specific pattern on histological examination, stains to rule out infectious etiology should be utilized. It was reported that granulomatous diseases/infections should always be excluded in the periocular form.<sup>5</sup> For our patient, Ziehl-Neelsen stain was requested and it was negative. Also, the patient was referred for evaluation of sarcoidosis which was also negative. Tuberculosis was initially considered correlated with GA, but after several reports, this association was generally discounted.<sup>10</sup> However, GA and sarcoidosis can co-exist.<sup>11,12</sup>

GA is usually benign and self-limiting, so clinical follow-up represents the first-choice therapeutic option, with an excellent prognosis without treatment.<sup>5</sup> Otherwise, there is no universally accepted treatment. Administration of topical steroid or intralesional triamcinolone injection and other systemic medications including antimalarials, potassium iodide, and dapsone have been reported with variable effects.<sup>1,2,13</sup> Surgical excision is regarded as beneficial for diagnosis rather than treatment since lesions can recur after removal. The recurrence could occur with reduced size of the initial lesions and cosmetically acceptable appearance like in our patient.<sup>13</sup>

### 4. Conclusions

Our case demonstrates the typical clinical features and demographics of GA, but with the additional rare site of involvement. Ophthalmologists should always correlate eyelid nodules with other skin manifestations. In our patient, the absence of associated medical conditions and the classic appearance of his foot lesions support the diagnosis of the GA. Prompt recognition of this rare periocular lesion but benign entity enables the clinician to provide appropriate reassurance to the patient and his parents. Surgical excision can rapidly achieve cosmetic goals despite being self-limiting.

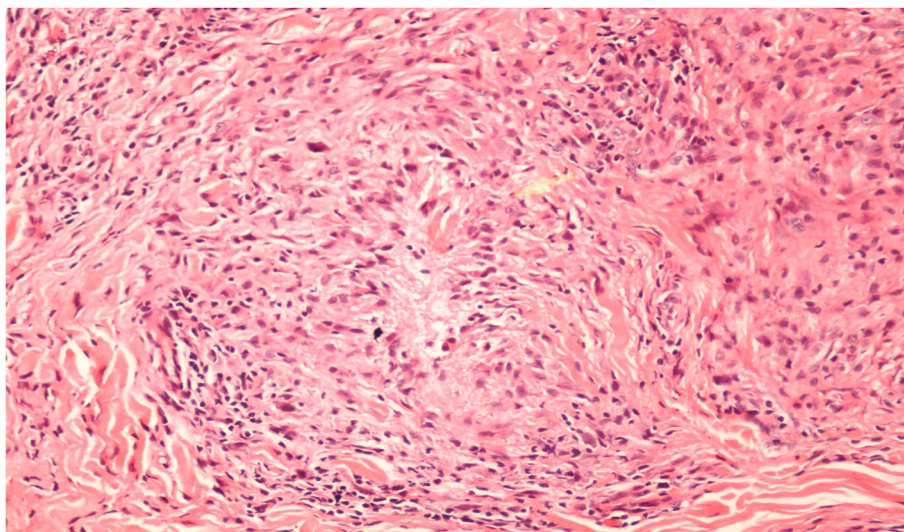


Fig. 3. Palisading histiocytes surrounding necrobiotic collagen in the center of the granuloma (HEx200).

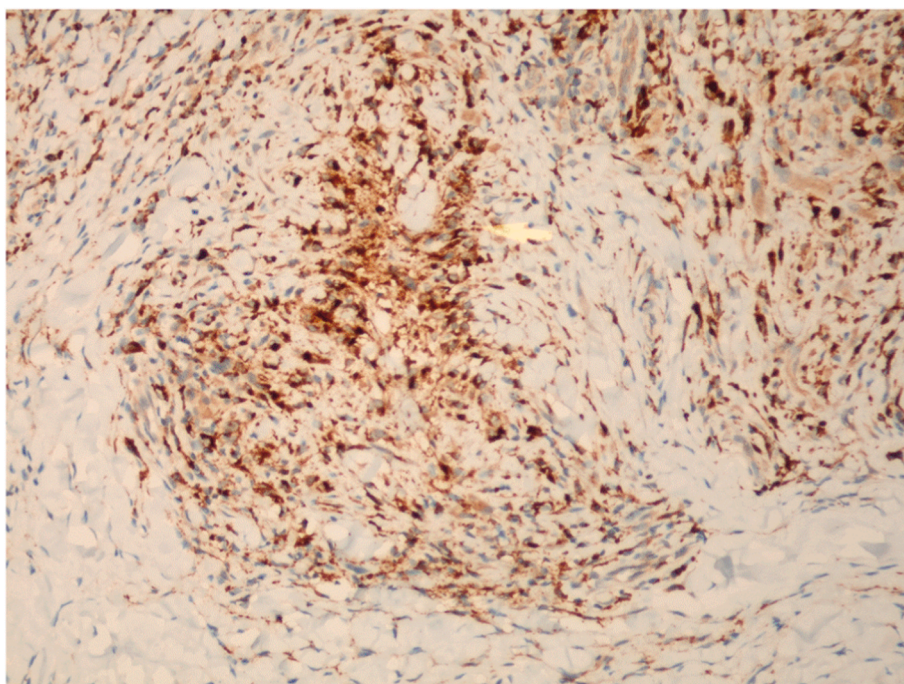


Fig. 4. CD68 positive histiocytic cells palisading the granuloma (IHCx200).

**Patient consent**

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

**Disclosures**

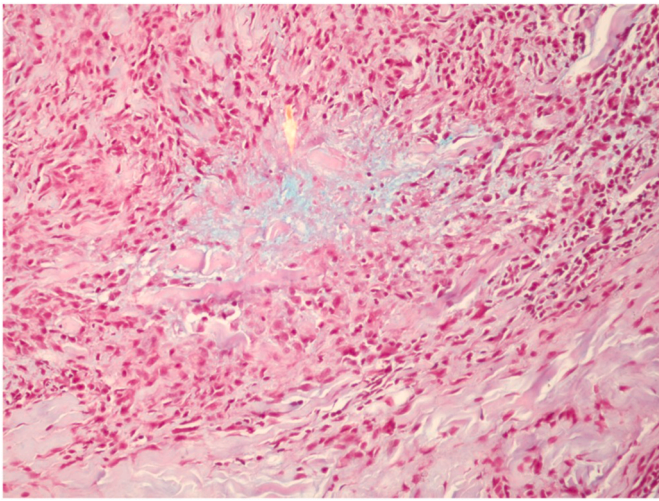
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**Authorship**

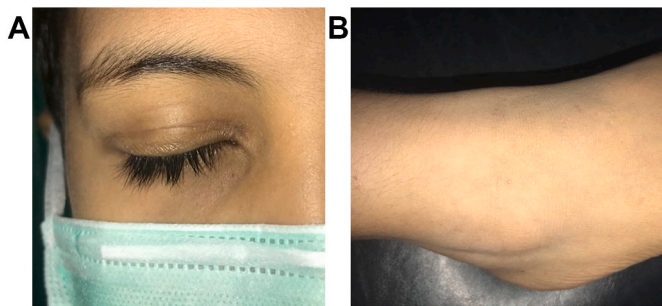
All authors attest that they meet the current ICMJE criteria for Authorship.

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**Fig. 5.** Alcian blue for mucin stains positive in the center of granuloma (HEx200). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)



**Fig. 6.** Clinical findings in the last follow-up visit. (a) Right eyelid (b) Right ankle.

#### Declaration of competing interest

The following authors have no financial disclosures: AWA, SAB, FAA.

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