Title
A solitary lesion of idiopathic calcinosis cutis in an infant: subepidermal nodular calcinosis or milia-like idiopathic calcinosis cutis?

Journal
Dermatology Online Journal, 27(5)

Authors
Mansur, Ayşe Tülin
Küllü, Sevgi

Publication Date
2021

DOI
10.5070/D327553620

A solitary lesion of idiopathic calcinosis cutis in an infant: subepidermal nodular calcinosis or milia-like idiopathic calcinosis cutis?

Ayşe Tülin Mansur[1] MD, Sevgi Küllü[2] MD

Affiliations: [1]Department of Dermatology, Academic Hospital, İstanbul, Turkey, [2]Department of Pathology, Academic Hospital, İstanbul, Turkey

Corresponding Author: Ayşe Tülin Mansur, Altunizade, Nuhkuyusu Caddesi, No: 94, 34662 Üsküdar, İstanbul, Turkey, Tel: 90-535 207 24 11, Email: tulinmansur@gmail.com

Abstract

Milia-like idiopathic calcinosis cutis (MICC) and subepidermal calcified nodule (SCN) are described as different entities under the heading of idiopathic calcinosis cutis. Although there are some clinical differences, they share many features. Whereas MICC lesions are located mostly on the extremities and rarely on the face, SCN manifests itself mostly on the face, rarely on the extremities. Milia-like idiopathic calcinosis cutis almost always presents with multiple lesions, whereas SCN shows mainly solitary and rarely multiple lesions. Association with Down syndrome (DS) has been reported in up to two-third of the cases with MICC, but not in SCN. We herein present a 5-months-old girl without DS, manifesting a 2mm solitary, white hard papule surrounded by erythema, located on the finger. Histopathologic findings revealed the presence of dermal calcium deposits. When a solitary papular lesion of idiopathic calcinosis is seen in a child, especially if not associated with DS, it is difficult to differentiate MICC from SCN. We believe that these entities may represent variants of the same pathology and it may be more appropriate to designate a solitary lesion as SCN, regardless of its location.

Keywords: calcified nodule, calcinosis cutis, classification, diagnosis, idiopathic, milia, subepidermal

Introduction

Milia-like idiopathic calcinosis cutis (MICC) is a rare type of cutaneous calcinosis that mostly occur in childhood. It is characterized by whitish papules similar to milia. The upper and lower extremities are most commonly affected, whereas involvement of face has rarely been reported [1,2].

Subepidermal calcified nodule (SCN), which is an another form of idiopathic calcinosis cutis, presents as an asymptomatic small papule or nodule, seen predominantly in children [3]. It is mainly a solitary lesion located on the face, but multiple lesions and involvement of extremities have been rarely reported [3,4]. Herein, we report an infant with a solitary lesion of idiopathic calcinosis cutis and discuss the relationship between MICC and SCN.

Case Synopsis

A 5-month-old girl was referred to the dermatology outpatient clinic because of a white-colored, indolent papule on the second finger of the right hand, present for four months. She and her twin brother were born at 39-weeks gestation by caesarean section. Her birth weight was 2130gr, Apgar score was 10; therefore no intensive unit nursery was required. Laboratory parameters performed after birth including fasting glucose, complete blood cell count, serum calcium, and bilirubins showed normal values. Her parents did not recall any injury on the finger at birth or later on. One month after the delivery, a white papule had appeared on the dorsal area of the finger. In time, it had become more protuberant and developed a red halo. Her twin brother had no similar lesion. Physical examination revealed no abnormality or sign of

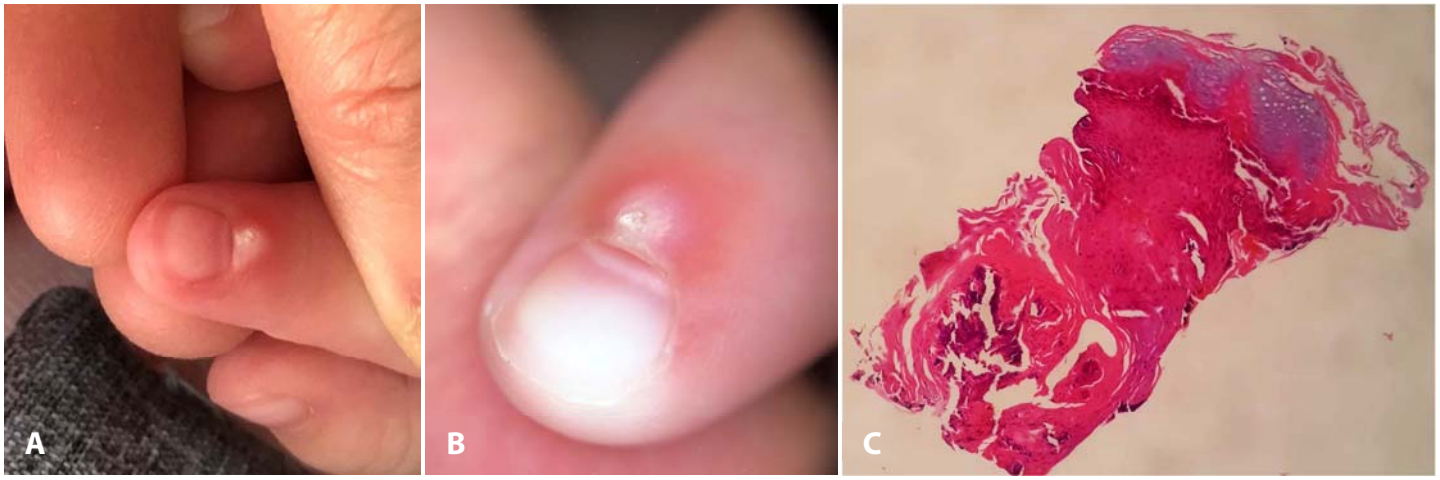

Figure 1. ***A)*** *Whitish, small papule, with a firm protrusion on top of it, surrounded by erythema.* ***B)*** *Dermatoscopy shows chalky-white, circular area with a crust like bulge and slight petaloid appearance, surrounded by red structureless halo.* ***C)*** *Hyperkeratosis, parakeratosis, acanthosis, and basophilic degeneration with foci of dark basophilic-stained deposits of calcium. H&E 40×.*

Down syndrome (DS). On dermatologic examination a white-colored, firm, 2mm papule with a prominent peripheral erythema was present on periungual skin, adjacent to the proximal nail fold (**Figure 1A)**.

Dermatoscopy revealed a central chalky-white, circular area with a crust like bulge, surrounded by yellowish white clods and lines, slightly resembling petals. The peripheral area was pinkish-red, homogenous, and structureless (**Figure 1B)**.

Owing to the age of the patient and close proximity of the lesion to the nail matrix, we preferred to perform curettage of the contents through a small incision instead of a punch biopsy. Histopathologic examination revealed hyperkeratosis, parakeratosis, and basophilic degeneration overlying fragments of acanthotic squamous epidermis, with foci of dark basophilic-stained deposits of calcium just beneath the epidermis. (**Figure 1C)**.

After 6 months, no recurrence or new lesion was observed.

Case Discussion

Milia-like idiopathic calcinosis cutis is a form of calcinosis cutis, that occurs without an identifiable underlying tissue abnormality or systemic metabolic disorder. This entity, in addition to idiopathic scrotal calcinosis, tumoral calcinosis, and SCN, are grouped under idiopathic calcinosis cutis. It was first described by 1978 but since then, only about 30 cases have been reported [1,2].

Milia-like idiopathic calcinosis cutis mostly occurs in childhood, ranging from four months to18 years, and is associated with DS in about two thirds of patients. Palpebral or perilesional syringomas which are also skin lesions frequently seen in DS, may appear simultaneously with MICC [2].

The etiopathogenesis is unclear. Calcium retention in sweat glands, recurrent trauma, or secondary calcification of preexisting microepidermal cysts have been supposed as causative or triggering factors [1,2,5,6]. In our case there was no DS or preceding history of trauma, but we speculate that twin pregnancy might have promoted repeated intrauterine physical trauma.

The lesions of MICC are yellow-to-white, smooth, round, firm, and asymptomatic papules of 1-4mm in diameter. They resemble milia and are sometimes surrounded by erythema. Almost always there are multiple lesions that are mainly located on the hands and feet and rarely on the face [1,2,5,6].

Accurate diagnosis of MICC is established by histopathologic examination. Microscopic features include a well-circumscribed, round, amorphous basophilic substance in the upper dermis, usually surrounded by collagen fibers and sometimes by epithelioid and multinucleated giant cells. Basophilic material appears black by von Kossa staining,

Table 1: *Comparison of milia-like idiopathic calcinosis cutis, subepidermal calcified nodule, and the presented case.*

	MICC	SCN	Presented case
Age	More common in children	More common in children	5 months old
Gender	M=F	M/F: 2/1	F
Number of lesions	Mainly multiple, very rarely solitary	Mainly solitary, rarely multiple	1
Size of lesion	Mostly 1-4mm, rarely larger (5-8mm)	Mostly <0.5cm, rarely larger (>2cm)	2mm
Morphology	Smooth, firm, round white papules, some with a central crust	White-yellowish firm, small nodule	Firm white papule with surrounding prominent erythema
Location	Mostly extremity (hand, foot, knee, thigh, elbow, forearm, wrist) Rarely face (eyelid, periorbital, forehead)	Mostly face (eyelid, ear, nose, cheek, chin) Rarely extremity (heel, knee, finger, palm)	Extremity (finger)
Mucosal involvement	Not described	Rarely present	None
Associated systemic pathology	Down syndrome in some cases	Not reported	None
Dermatoscopic features	White structures forming a subtle petaloid appearance	Not described	Similar to MICC
Histopathologic features	Acanthosis, hyperkeratosis, dermal calcium deposits, occasional foreign-body reaction	Acanthosis, hyperkeratosis, dermal calcium deposits, occasional foreign-body reaction	Upper dermal calcium deposits
Treatment	Wait and see (may heal spontaneously), CO_2 laser	Surgery, CO_2 laser, intralesional steroid injection	Curettage after incision

MICC, milia-like idiopathic calcinosis cutis; SCN, subepidermal calcified nodule

confirming that it is calcium. Transepidermal elimination of the calcific deposits may be present [1,2,5,6].

Dermatoscopy may aid the diagnosis. In a few reported cases, white structures forming a subtle petaloid appearance have been detected under dermatoscopy. Though white structures are also seen in molluscum contagiosum or milia, it is suggested that the central crust corresponding to the transepidermal elimination of calcinosis may be important for the diagnosis of MICC [5,6]. Our case showed the dermatoscopic features described for MICC, supporting the diagnosis of perforating calcinosis cutis.

Subepidermal calcified nodule manifests itself as an asymptomatic, white-to-yellowish, firm papule, with a smooth or verrucous surface [3]. An erythematous component may be present. It is mainly a solitary lesion on the face, but multiple lesions and involvement of extremities have rarely been reported [4, 7]. In the case reported by Kim et al., the lesions were white, 1-3mm sized papules which closely resembled MICC [7]. The lesion of SCN is 1-6mm in diameter, but larger nodules have been described occasionally [4]. This entity has not been associated with systemic disorders and etiopathogenesis is not clear. Histopathological examination usually shows an epidermal reaction including hyperkeratosis, focal parakeratosis, acanthosis, and dermal calcium deposits, either as closely aggregated globules or large masses, predominantly in the upper dermis. A histiocytic reaction and foreign-body type giant cells may be observed in longstanding lesions [3,4]. Transepidermal elimination of calcium may be seen [8].

It is difficult, almost impossible, to differentiate a lesion of MICC from SCN, owing to almost identical

Table 2: *Comparison of milia-like idiopathic calcinosis cutis cases with solitary lesion, and the presented case.*

	Cho E et al, 2013	Shin BS et al, 2013	Presented case
Age	11 year	17 year	5 months
Gender	F	M	F
Number of lesions	1	At present 1, 6 years ago multiple	1
Size of lesion	3mm	5mm	2mm
Morphology	Hard, superficial, yellow nodule	Firm whitish papule	Firm white papule with surrounding prominent erythema
Location	Palm	Upper eyelid	Finger
Dermatoscopic features	Not described	Not described	White structures forming a subtle petaloid appearance
Associated systemic pathology	None	None	None
Histopathologic features	Subcorneal calcium deposits surrounded by a fibrous strip	Upper dermal basophilic calcium deposits, surrounded by collagen fibers and fibroblasts	Upper dermal basophilic deposits of calcium, acanthotic and hyperkeratotic epidermis
Treatment	Excision	Excision	Curettage after incision

clinical features. Though the term "nodule" has been used for designation of SCN, the lesion is usually not larger or deeper than those of MICC. Moreover, microscopic examinations reveal similar features. Absence/presence of DS is not a critical point for discrimination, since several cases of MICC without DS have been reported [1]. There are only a few reports on dermatoscopic characteristics of MICC and no description in cases with SCN yet. Transepidermal elimination of calcium may be seen in both entities so that a central crust seen on dermatoscopy may not be specific for MICC. **Table 1** shows a comparison of the features of MICC and SCN, in addition to those of our patient.

We believe that the most important feature for differentiation is the lesion count. To the best of our knowledge there are only two reported cases of MICC with a solitary lesion. The first one was an 11-year-old girl without DS, who showed a 3mm, hard papule on her palm. In this case calcium deposits were subcorneal, in contrast to dermal involvement in cases with multiple lesions; consequently, they may be considered seperately [9]. The other was an adolescent with recurrent lesions on the upper eyelid. Although the initial lesions were multiple, a solitary lesion developed at the same area after 6 years [10]. **Table 2** shows features of these cases in comparison with our patient.

Conclusion

We present an infant with a solitary lesion of idiopathic calcinosis and emphasize the difficulty to diagnose MICC or SCN specifically. These entities may represent variants of the same pathology with only minor clinical differences. As the most consistent characteristic of MICC is to manifest with multiple lesions, we suggest that solitary lesions of idiopathic calcinosis cutis may be categorized under the heading of SCN, regardless of location.

Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Bécuwe C, Roth B, Villedieu MH, et al. Milia-like idiopathic calcinosis cutis. *Pediatr Dermatol.* 2004;21: 483-5. [PMID: 15283797].
2. Motegi SI, Sekiguchi A, Fujiwara C, et al. Milia-like idiopathic calcinosis cutis and plaque-type syringoma in a girl with Down syndrome. *J Dermatol.* 2019;46:e136-e137. [PMID: 30194873].

3. Evans MJ, Blessing K, Gray ES. Subepidermal calcified nodule in children: a clinicopathologic study of 21 cases. *Pediatr Dermatol.* 1995;12:307-10. [PMID: 8747574].
4. Qader MA, Almalmi M. Diffuse cutaneous calculi (subepidermal calcified nodules): case study. *Dermatol Ther.* 2010;23:312-5. [PMID: 20597952].
5. Fox GN, Mehregan DA, Jablonowski MN. Acral milia-like idiopathic calcinosis cutis in a child with down syndrome: report of a case, review of the literature, and description of dermoscopic findings. *Pediatr Dermatol.* 2013;30:263-4. [PMID: 22276686].
6. Kawaguchi M, Suzuki T. Dermoscopy is useful for the diagnosis of milia-like idiopathic calcinosis cutis. *Australas J Dermatol.* 2018;59:63-4. [PMID: 28726314].
7. Kim HS, Kim MJ, Lee JY, et al. Multiple subepidermal calcified nodules on the thigh mimicking molluscum contagiosum. *Pediatr Dermatol.* 2011;28:191-2. [PMID: 20738792].
8. Nakamura Y, Muto M. Subepidermal calcified nodule of the knee with transepidermal elimination of calcium. *J Dermatol.* 2012;39:965-6. [PMID: 22257416].
9. Cho E, Jun HJ, Cho SH, et al. Subcorneal milia-like idiopathic calcinosis cutis: a rare presentation. *Ann Dermatol.* 2013;25:249-50. [PMID: 23717024].
10. Shin BS, Choi H, Choi KC, et al. Recurrent milia-like idiopathic calcinosis cutis on the upper eyelid. *Ann Dermatol.* 2013;25:520-2. [PMID: 24371412].