

## CASE REPORT

## A Case of a Subepidermal Calcified Nodule on the Sole without Trauma

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Subepidermal calcified nodule is an uncommon form of calcinosis cutis, which most commonly occurs in children. It usually presents as an asymptomatic, solitary verrucous nodule on the head and neck region, but occasionally as multiple lesions. Serum calcium and phosphorus levels are usually normal. Histopathology shows well-formed homogeneous eosinophilic material and granules in the upper dermis. Material in the dermis stained with von Kossa was positive. We report on an unusual case of a subepidermal calcified nodule occurring on the sole. A 21-month-old male presented with an oval-shaped, whitish, hard nodule measuring 5×5 mm on the left sole, without any previous history of trauma. (**Ann Dermatol 23(S1) S116~S118, 2011**)

**-Keywords-**

Calcified, Sole, Subepidermal

### INTRODUCTION

Subepidermal calcified nodule (SCN) is an uncommon form of calcinosis cutis. SCN, also called cutaneous calculi, is usually a single small and hard nodule on the face. In most instances, the surface of the nodule is verrucous; however, it may be smooth<sup>1</sup>.

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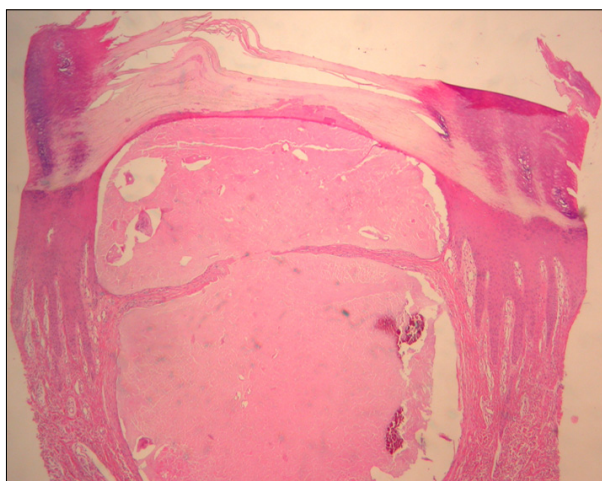
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SCN often occurs in damaged tissues in the absence of abnormalities in serum calcium or phosphate levels. It has been reported in a variety of local tissue injuries, including repeated trauma<sup>2</sup>. Some reports have suggested development of calcified nodules on the heel following multiple heel sticks for venesection during the neonatal period<sup>3,4</sup>. Similar cases in high risk neonates in intensive care units have been reported<sup>5-7</sup>. Though our patient had a history of heel sticks during the neonatal period, the lesion did not appear at the site where heel sticks were generally performed. Therefore, we conclude that our case is not associated with trauma.

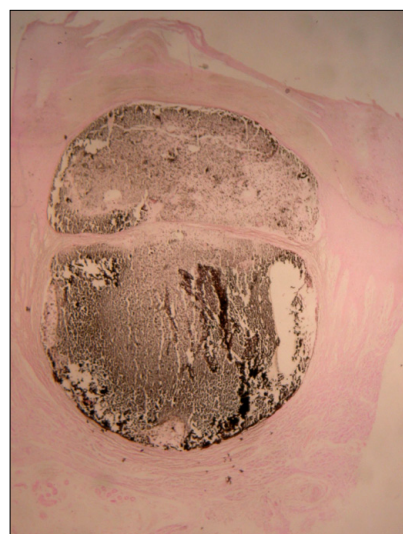
In Korea, according to the first report on 6 cases by Son and Kim<sup>8</sup>, most lesions appeared on the eyelid and cheek<sup>8-11</sup>. There were no cases involving occurrence on the sole without trauma. We present an unusual case with unique clinical and histopathological features of child-



**Fig. 1.** An oval-shaped, whitish papule measuring 0.5×0.5 cm on an erythematous base of the left sole.



**Fig. 2.** Haematoxylin and eosin-stained sections showed a hyperkeratotic and acanthotic epidermis overlying a cystic structure in the upper dermis. The cystic space contained amorphous eosinophilic materials as multilobulated masses (H&E stain,  $\times 40$ ).



**Fig. 3.** Amorphous black to dark brown colored materials were confirmed as calcium by staining with von Kossa (von Kossa stain,  $\times 40$ ).

hood SCN on the sole without trauma.

## CASE REPORT

A 21-month-old boy visited our clinic because of an asymptomatic, warty papule on the left sole that had developed over the last 4 months. There was no history of preceding trauma. On physical examination, a painless, oval shaped, whitish papule measuring 5 mm on an erythematous base was observed on the left sole (Fig. 1). It resembled a verruca. The boy was otherwise in good health. Serum calcium and phosphorus levels were within normal limits.

The nodule was excised by punch biopsy under local anesthesia. Haematoxylin and eosin-stained sections showed a hyperkeratotic and acanthotic epidermis overlying a cystic structure of the upper dermis and narrow pointed rete ridges in the dermis. The cystic space contained amorphous eosinophilic materials as multilobulated masses (Fig. 2). The amorphous basophilic material described in this paper appeared to be eosinophilic, indicating occurrence of degenerative and insufficient calcium on the amorphous basophilic material.

The materials were confirmed as calcium by staining with von Kossa (Fig. 3), which looks brown in color rather than black. It can be explained by two reasons: The first, the tissue sample itself showed faint staining. Early calcification, detected by von Kossa stain, could not be discovered by routine H&E staining<sup>12</sup>. The second, the high calcium area shows a black color in contrast to the brown colored calcium-lacking site. In another study of calcified lesions, 53

von Kossa-positive cases showed only 29 positive H&E (basophilic), while another 24 cases were negative on H&E<sup>13</sup>. In addition, PAS, Alcian blue (pH 2.5), and congo red stain were performed for determination of glycogen, mucopolysaccharides, and amyloid, which all showed a negative result. It suggested that the lesion contained deposits of calcium, though it appeared to show poor staining on H&E.

The lesion was completely removed by punch and there was good healing without recurrence.

## DISCUSSION

In the human body, normal calcification appears only in bones and teeth. Cutaneous calcium deposits were described by Duhring as early as 1877; however, but they were first recognized by Winer<sup>14</sup> in 1952 and named by Woods and Kellaway<sup>15</sup> in 1963. SCN occurs more commonly in children and can also occur at birth. Incidence among male and female children is approximately equal<sup>16</sup>. Clinically, SCN is presented as a single raised, well circumscribed, whitish and hard nodule with a smooth or verrucous surface<sup>9</sup>. Multiple lesions can also be seen, but less often<sup>17</sup>. The most common location of SCN is the face<sup>18</sup>.

Pathogenesis of this disease is still unknown; however, in 1980, Tezuka<sup>19</sup> proposed that SCN is caused by degranulation of mast cells with subsequent deposition of calcium and phosphates on the discharged mast cell contents. Histopathology of SCN consists of homogeneous basophilic masses and variable sized granules in the upper

dermis with hyperkeratosis, focal parakeratosis, papillomatosis, and epidermal hyperplasia. Calcium forms granules, globules, or large masses, which often contain nuclei. A lymphohistocytic infiltrate, macrophages, foreign body granulomatous giant cells, can be seen. Calcium-containing tissue is positive for von Kossa staining<sup>18,19</sup>. Surgical excision is the treatment of choice for patients with SCN<sup>20</sup>. However, intralesional therapy (corticosteroids) has also been reported<sup>21</sup>.

In Korea, most cases of SCN occurred on the eyelid<sup>9-11</sup> and cheek<sup>8</sup>, and, in some cases, lesions showed bilateral occurrence on thighs<sup>22</sup>, buttocks<sup>23</sup>, and fingertips<sup>24</sup> in adulthood. Patients vary in age, from 3 to 55 years. There have been 4 cases reported as having less than a 1-year of duration of illness<sup>22,23</sup>, 1 case with 7 years<sup>8</sup>, and 2 cases with 20 years<sup>11,24</sup>. In this case, age of onset was 21 months, the youngest among domestic reports, after 4 months of spontaneous development without any trauma history. This is the age when toddling begins; therefore, we could consider the possibility that toddling itself might stimulate the onset of disease; however, there was no evidence of trauma. At the beginning, spontaneous tiny white papules without trauma were observed, and the lesion grew larger over a period of 4 months, suggesting that the lesion occurred naturally.

Our patient is asymptomatic; however, Rho et al.<sup>3</sup> reported that this condition does not always remain asymptomatic and show spontaneous resolution. There have been several reports of calcinosis cutis classified as dystrophic calcinosis cutis, due to chronic dermal damage by multiple heel sticks in children with a medical history of admission to the neonatal intensive care unit (NICU)<sup>5-7</sup>. Development of calcinosis cutis on the sole and without trauma is rare. For this reason, we report on this case, involving asymptomatic occurrence on the sole.

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