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Case Report

Localized Angiokeratomas in healthy adolescence responded to topical Timolol

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ABSTRACT

Angiokeratoma (AK) is an uncommon vascular cutaneous illness that is characterized by benign vascular ectasias of the papillary dermis combined with papillomatosis, acanthosis, and hyperkeratosis of the epidermis. It often presents as mainly asymptomatic. Here, we present a case of a 14-year-old Saudi male who presented to the dermatology clinic with red-to-black nodules of varying sizes on the palmar and dorsal surfaces of his left hand. Upon examination, the nodules were painless with no other constitutional symptoms. Laboratory investigations were unremarkable. A 4-mm skin punch biopsy showed dilated vascular channels at the papillary dermis and corneal layer with acanthotic epidermis with granulation tissue; these findings were suggestive of AKs of Mibelli. Timolol drops were prescribed twice daily for 1 month, and the patient was seen after a month with a 90% resolution of lesions. This case study describes an intriguing instance of eruptive AK of Mibelli that was treated with Timolol 0.5% drops and was localized unilaterally over the left hand in a youngster who had previously been in good health. To the best of our knowledge, no previously reported AK of Mibelli cases that responded to Timolol 0.5% drops.

Keywords: Angiokeratoma of mibelli, eruptive, localized, timolol drops

Introduction

Angiokeratoma (AK) is a rare vascular skin condition characterized by benign vascular ectasias of the papillary dermis, along with papillomatosis, acanthosis, and hyperkeratosis of the epidermis. It often presents as primarily asymptomatic.[1] AK prevalence in the general population is estimated to be around 0.16%. Females between the ages of 10 and 15 years are most commonly affected.[2]

There are five recognized clinical manifestations of AKs: solitary or multiple AKs, AK of Fordyce, AK of Mibelli, AK of corporis diffusum, and AK circumscriptum.[3]

Mibelli first reported the word AK in 1889, based on the anatomic description of lesions on the dorsum of a 14-year-old girl's hands and feet.[4] The "Mibelli-type" affects young individuals who have recurrent chilblain episodes, primarily on the fingers.[5] Herein, we report a rare case of acquired eruptive AK s of Mibelli in a previously healthy adolescent boy who responded well to timolol drops.

Case Report

This is a case of a 14-year-old Saudi male who presented to the dermatology clinic with his parents with red-to-black papules and nodules varying in size on the palmar and dorsal surface of the left hand [Figure 1]. There is no history of such lesions before and no family history of the same condition. There was no history of physical trauma and no history of infections. Upon examination, the nodules were painless with no other constitutional symptoms. Laboratory investigations were unremarkable. Upon the first visit, a skin biopsy was taken from one of the well-formed lesions. AK s of Mibelli were congruent with the results of a 4-mm skin punch biopsy, which revealed dilated vascular channels at the papillary dermis and corneal layer with acanthotic epidermis and granulation tissue [Figure 2]. Timolol 0.5% drops were prescribed twice daily, and the patient was seen after a month with a 90% resolution of lesions [Figure 3].

Discussion

AK of Mibelli is a rare condition affecting children aged 10–15, primarily affecting the dorsal and lateral sides of fingers and toes. It can also appear on the dorsal of hands, feet, and occasionally on the elbows and knees. The condition may be linked to perniosis or acrocyanosis and has an autosomal dominant inheritance pattern.[6,7] This case report presents a rare 14-year-old male with unilateral acquired eruptive AK s of Mibelli, localized over the left hand in a previously healthy child, which responded to topical 0.5% Timolol.

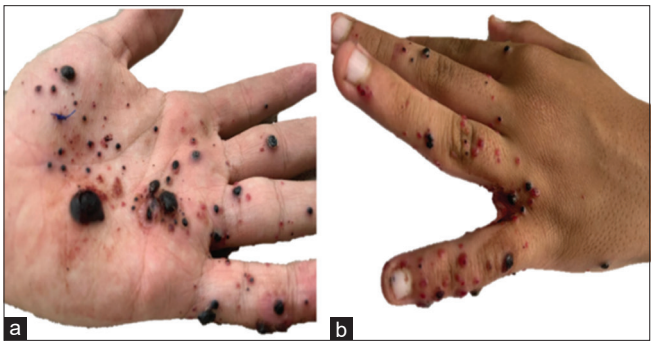

Figure 1: Clinical presentation. (a) Palmar surface of the left hand and (b) Dorsal surface of the left hand showing multiple red to black nodules varying in size, few were hemorrhagic

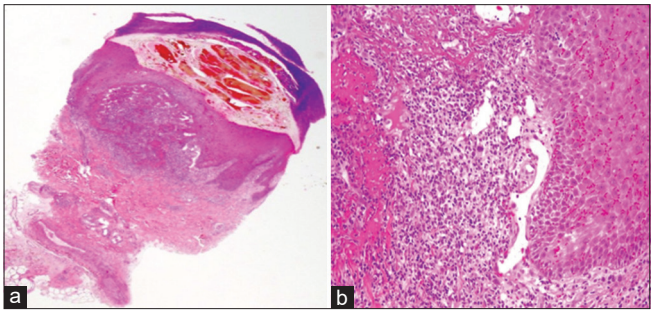

Figure 2: Histopathology (a) Photomicrograph of skin punch biopsy exhibits dilated vascular channels at the papillary dermis and corneal layer (H/E stain, original magnification ×20). (b) Higher power view reveals acanthotic epidermis with granulation tissue and vascular dilatation at the papillary dermis (H/E stain, original magnification ×100)

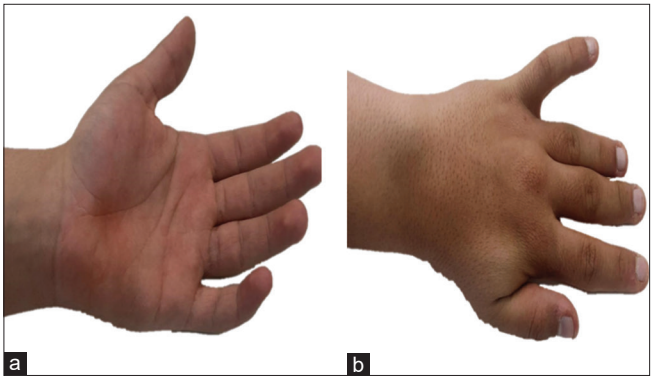

Figure 3: Clinical presentation of the left hand after using timolol 0.5% drops; Palmar Surface (a) and Dorsal surface (b)

The pathogenesis of AK is still obscure; the skin's end capillaries are found in the dermal papillae and are made up of bigger venous and smaller arterial limbs that branch out from the corresponding subpapillary plexus at right angles perpendicular to the skin's surface. Capillary loops are present at the tip of the papillary dermis. Some authors believe ectasia of the walls with stasis of blood can lead to increased luminal pressure, in turn causing dilation of capillaries and accumulation of blood, which is triggered by factors, such as recurrent trauma, hypoxia, chilblains, and hemodynamic alterations. Few researches attribute epidermal hyperkeratosis and acanthosis as secondary reactive phenomena that prevent further expansion of the vascular space.[7]

AKs are occasionally clinically mistaken as pigmented lesions, such as vascular lesions, hemangiomas, pyogenic granulomas, melanocytic nevi, and melanomas. Twenty percent of AK s were clinically identified as melanomas, according to a prior study.[8]

The majority of AK patients are diagnosed by physical examination and history. If there is suspicion of a potential cancer, a biopsy is necessary. Concerning characteristics of melanoma include asymmetry, irregular borders, color variation, diameters exceeding 6 mm, and evolving over time.[9] The histopathological examination in cases of AK reveals the presence of dilated capillary vessels in the papillary dermis, which are frequently transformed into a single, sinusoidal vascular channel. The surrounding epidermis exhibits varying degrees of hyperkeratosis and acanthosis, and elongated rete ridges grow down to encircle the dermal dilated vascular channels.[10] Regarding our case, a small 4 mm skin biopsy revealed widened blood vessels in the upper skin layer, along with thickening of the outer skin and new tissue growth. However, the presence of this new tissue alone does not confirm a diagnosis of AK unless an open sore is present. This finding suggests another possibility: pyogenic granuloma. However, the clinical and histological findings collectively indicate a diagnosis of AK.

Cryotherapy, electrosurgery, and surgical excision are traditional therapies for skin lesions that are tiny and isolated or sparsely distributed. There is a chance that these therapies will cause scarring, atrophy, and bleeding.[11] Laser therapies, such as argon, neodymium, infrared, and carbon dioxide are commonly used but can cause complications, such as pain, purpura, bleeding, dyspigmentation, and permanent scarring. Topical anesthesia is frequently needed for larger regions of pain and discomfort. Multiple laser sessions are often required for desired results.[11] We present a case of eruptive unilateral AKs over the left hand, which were successfully treated with topical 0.5% Timolol, in consistent with Gandhi *et al*. 2021,[12] who reported a case of bilateral eruptive AKs across the flanks. The lesions were effectively treated with topical 0.5% long-acting timolol twice a day. As for the treatment of benign vascular tumors, the primary line of therapy for infantile hemangiomas (IH) is beta blockers. They can be ingested as pills or liquids (propranolol or atenolol) or as gel drops (timolol) applied topically. Vasoconstriction, suppression of angiogenesis by downregulation of angiogenic factors, vascular endothelial growth factor, basic fibroblast growth factor, and activation of capillary endothelial cell death are considered to be their mechanisms of action in IH.[13] As demonstrated in this instance, the same processes are probably beneficial in the treatment of AKs. In a similar study, Al Shidhani *et al*., 2022,[14] reported a case of a 7-year-

old girl who was diagnosed with rapidly eruptive multiple AKs, localized over the right hand, they found that almost 95% of the lesions resolved spontaneously within 3 months of presentation. In addition, in 2016, Saeb-Lima *et al*. described two adult cases of numerous isolated AKs with evidence of transepidermal elimination of thrombosed blood vessels and spontaneous involution of part of the lesions. Recently, in 2024, Anannya *et al*. reported a series of five cases of AK of Fordyce, one case of them of a pregnant a 34-year-old woman (gestational age: 31 weeks) who reported spontaneous resolution postpartum. Regarding our case, topical timolol fastened the resolution of the lesions, and the patient recovered in almost a month. Determining the effectiveness of beta-blockers in treating AKs would require thorough clinical research to assess their efficacy, safety, and potential side effects in this specific context.

Conclusion

This case study presents an intriguing instance of eruptive AK of Mibelli, which was treated with Timolol 0.5% drops and was localized unilaterally over the left hand in a youngster who had previously been in good condition. Although spontaneous resolution has been reported, topical timolol may fasten the resolution of the lesions. To the best of our knowledge, no prior reports of cases comparable to this one exist.

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Consent to Participate

Written consent has been taken from the parents of patient.

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