CASE REPORT

Knuckle pads. Medical review and case report

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ABSTRACT

Knuckle pads or Garrod's pads are benign cutaneous nodules affecting the dorsum of the proximal interphalangeal and metacarpophalangeal joints of the hands. They are rarely examined at a dermatologist's office, hence the few case reports in medical literature. The case of a 12-year-old boy presenting with trauma-induced nodules of 4-year evolution is reported.
Diagnosis of knuckle pads was made.

INTRODUCTION

Knuckle pads, also known as Garrod's pads, are benign papulonodular lesions, frequently located at the metacarpophalangeal and proximal interphalangeal joints of the hands. They are usually asymptomatic and don't compromise the joints or motion[1] Knuckle pads mainly occur in males during their third and fifth decade of life. Nonetheless, they can also manifest through adolescence.[2]

Knuckle pads may be secondary to fibrous diseases, such as Dupuytren's contracture, Peyronie's disease and Ledderhose's disease, as well as repetitive trauma due to boxing or surfing and psychiatric disorders causing continuous finger suction, friction and snapping. These lesions may also be associated to metabolic syndrome, especially abdominal obesity or hypertension with or without type 2 diabetes mellitus.[2]

CLINICAL CASE

A 12-year-old male patient with personal history of atopic dermatitis, without any other relevant family history, attended to the Dermatology Center Dr. Úraga presenting with follicular lesions in the arms, the anterior part of the thigh (bilaterally and symmetrically), as well as the abdominal area. Physical examination revealed demarcated hyperkeratotic nodular papules of 4-year evolution, bilaterally and symmetrically located at the extensor surface of the first and second proximal interphalangeal joint; lesions that the patient's mother associated with incessant biting throughout school (Figures 1 and 2). Dermoscopy showed a lesion displaying a milky pink elevated and infiltrated appearance, accompanied by surface desquamation without evident vascular structures nor thrombosed capillaries as in the case of viral warts (Figure 3). Clinical findings of the patient established knuckle pads as diagnosis. Skin biopsy was not required.

DISCUSSION

Knuckle pads or Garrod nodules were firstly described in the medical literature by Garrod in 1893. Nonetheless, these lesions were already acknowledged by Michelangelo during the renaissance period. He suffered from knuckle pads due to persistent trauma caused by his artistic labor. Concurrently, such condition was expressed through his line of sculptures: David, Moses,

Figure 1. Dorsal knuckle pads located at the first and second proximal interphalangeal joint of hands.

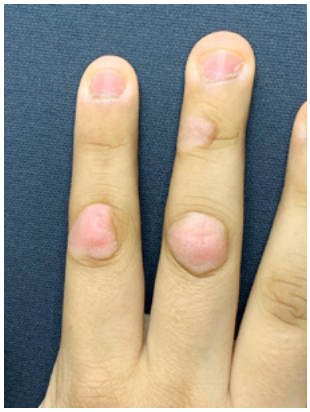

Figure 2: Pink nodes in the right hand.

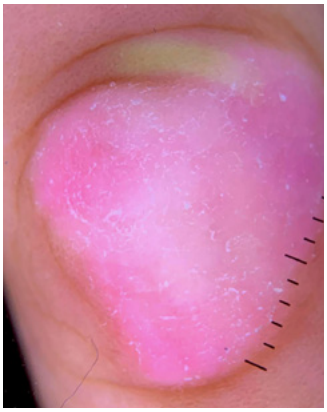

Figure 3: Dermoscopy reveals milky pink coloration and multiple small flakes.

Table 1. Reported cases of knuckle pads in medical literature.

CASE REPORT	JOURNAL	AUTHORS
Pathology of "Knuckle Pads" Study of Four Cases	Virchows Arch. A Path. Anat. And Histol 1975	Lagier R. and Meineeke R.
Knuckle Pads in Children	AJDC 1986	Paller A., Hebert A.
Papules and Plaques Over the Joint Spaces	Arch dermatol. 1993	Kodama B., Gentry R., Fitzpatrick J.
Knuckle Pads: Does Knuckle Cracking Play an Etiologic Role?	Pediatric dermatology 2000	Peterson C., Barnes C. , Davis L.
Pseudo-knuckle pads: an unusual cutaneous sign of obsessive-compulsive disorder in an adolescent patient	The Turkish Journal of Pediatrics 2003	Çalýkoðlu E.
A Novel Treatment for Knuckle Pads With Intralesional Fluorouracil	Arch dermatol 2007	Weiss E, Amini S.
Knuckle Pads – A common problem but good to treat by Laser	Aip conference proceedings (2010)	Herold M., Russe-Wilflingseder K.
Fibromatosis palmoplantar y nódulos de los nudillos	Piel 2010	Batalla A., Feal C., Prieto O., de la Torre C.
Knuckle pads – a rare finding	Journal of Ultrasonography 2012	Tamborrini G., Gengenbacher M., Bianchi S.
Report of a Family with Idiopathic Knuckle Pads and Review of Idiopathic and Disease-associated Knuckle Pads	Dermatology Online Journal, 2013	Hyman A., Cohen C., Philip R.
Characterization of Knuckle (Garrod) Pads Using Optical Coherence Tomography In Vivo	Cutis 2015	Luber A., Bienenfeld A., Clark C., Markowitz O.
Imaging Features of Knuckle Pads	Journal of the Belgian Society of Radiology 2016	De Keersmaeker A., Vanhoenacker F.
Acrokeratoelastoidosis and Knuckle Pads Coexisting in a Child	Cutis 2018	Barrick C., Moran J., Oram C, Purcell S.
A novel treatment for idiopathic knuckle pads with cantharidin-podophylotoxin-salicylic acid	Pediatric Dermatology 2019	Hasbún C., Sandoval M., Maximiliano C.

Victoria and Giuliano de Medici.[1,3,4] These lesions were previously known as articularw tylosis, helodermas, benign fibromas, supracapitular keratosis, pulvinus or subcutaneous fibromas.[2,5] They are asymptomatic, soft keratotic lesions measuring between 0.5 to 1.5 cm in diameter.[6-8] Garrod nodules occurr more commonly in distal interphalangeal joints than in metacarpophalangeal joints, rarely appearing at the knees or feet.[9]

The condition affects both males and females, with occupation being a contributing factor.[4] It usually manifests in patients aged thirty and fifty. Nonetheless, pediatric cases have been reported.[2,9]

Knuckle pads are mostly observed as hereditary or acquired, and solitary or multiple. In some cases, their origin is idiopathic or may be associated to diseases, such as fibromatosis (with minor occurrence), palmoplantar keratoderma, pseudoxanthoma elasticum, among others.[7,10] There are two knuckle pad family case reports related to sensorineural hearing loss and leukonychia, widely known as Bart-Pumphrey syndrome (of autosomal dominant inheritance due to gen GJB2 mutation).[7,11-13] Ritter et al. define a knuckle pad case associated with leukoplakia and esophageal cancer.[5]

Since there is limited recognition of such lesions, only a few cases have been reported in the medical literature. Some of them have been gathered in the following revision. (Table 1).[3,6,8-10,14-22]

Diagnosis is based on the clinical morphology of the lesions.[6] Complementary studies are required if the condition is related to other diseases and affected family members. Accordingly, skin biopsy, performed when necessary, reveals acanthosis, hyperkeratosis, parakeratosis, capillary fibroblast proliferation and a group of thick irregular collagen bands.[2,19,21] In the case of trauma-related knuckle pads, there are depressed areas and superficial loss of epidermis.[23]

Ecography showed an hypoechoic structure on the tendons and thickening of the skin, which differentiates knuckle pads from other pathologies.[2]

Radiography solely revealed an augmentation of soft tissue, without erosions or alteration of the joint space.[1]

Differential diagnosis included gouty tophi, which are yellow painful nodules in distal interphalangeal joints; rheumatoid nodules, mobile and asymptomatic; Gottron papules, violaceous plaques at the extensor surface of distal interphalangeal joints;[2] and other lesions, such as scars, warts, fibromas, foreign body granulomas and xanthomas.[10]

Considering nodules are asymptomatic, treatment is not usually required. If the lesions are caused by repetitive trauma, the patient is asked to quit the contributing habit.[24] In certain cases, to reduce the size of the lesion, topical corticosteroids and keratolytics, such as salicylic acid, urea and 5-fluorouracil, are applied.[1,20,23] Herold and cols. suggest the use of a long pulse erbium YAG laser in patients at high risk of recurrence, recognizing the risk of keloids and tendon anchorage after several surgical resections of the lesion.[21]

Hasbon and cols. describe a case with proper cosmetic results, in which 1 % cantharidin, 5% podophyllotoxin and 30% salicylic acid were combined.[17]

Surgical treatment of idiopathic knuckle pads is not recommended due to the lesions' high risk of recurrence and scar formation.[16]

This case presents trauma-induced clinical lesions, which, in contrast to primary lesions, did not require complementary studies.

CONCLUSION

Knuckle pads or Garrod nodules represent a relatively unknown pathology in the dermatological medical literature. Correct diagnosis, apart from the acknowledgment of their traumatic origin, rules out a possible association to other diseases.

Proper clinical assessment and examination allows physicians to rule out possible diagnoses, such as diseases related to fibromatosis, rheumatoid nodules, Gottron papules or foreign body granulomas. Regarding trauma-induced knuckle pads, it is essential for patients to quit any habits contributing to the condition or be referred to a psychologist for assistance.

It is crucial to consider minimally invasive treatments without collateral effects to avoid recurrence.

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