

Subungual Exostosis in a Young Soccer Player

Georgi Tchernev^{1,2*}, Yavor Grigorov³, Stanislav Philipov⁴, Anastasiya Chokoeva⁵, Uwe Wollina⁶, Torello Lotti⁷, Jose Cardoso⁸, Irina Yungareva¹, Ilia Lozev¹, Georgi Konstantinov Maximov¹

¹Medical Institute of the Ministry of Interior, Medical Institute of Ministry of Interior (MVR), Department of Dermatology, Venereology and Dermatologic Surgery, Sofia, Bulgaria; ²Onkoderma, Private Clinic for Dermatologic Surgery, Sofia, Bulgaria; ³University Hospital Lozenetz, Department of Orthopedics and Traumatology, Sofia, Bulgaria; ⁴Sofiiiski universitet Sveti Kliment Ohridski, Meditsinski fakultet, Department of General and Clinical Pathology, Sofia, Bulgaria; ⁵Medical University Plovdiv, Dermatology and Venereology, Plovdiv, Bulgaria; ⁶Krankenhaus Dresden-Friedrichstadt, Department of Dermatology and Venereology, Dresden, Sachsen, Germany; ⁷Universitario di Ruolo, Dipartimento di Scienze Dermatologiche, Università degli Studi di Firenze, Facoltà di Medicina e Chirurgia, Chair of Dermatology, University of Rome G. Marconi, Rome 00186, Italy; ⁸Centro Hospitalar e Universitario de Coimbra EPE, Department of Dermatology and Venereology, Coimbra, Portugal

Abstract

Citation: Tchernev G, Grigorov Y, Philipov S, Chokoeva A, Wollina U, Lotti T, Cardoso J, Yungareva I, Lozev I, Georgi Maximov GK. Subungual Exostosis in a Young Soccer Player. Open Access Maced J Med Sci. <https://doi.org/10.3889/oamjms.2018.002>

Keywords: Surgery; exostosis; nail; verruca vulgaris; treatment outcome

***Correspondence:** Georgi Tchernev. Medical Institute of the Ministry of Interior, Medical Institute of Ministry of Interior (MVR), Department of Dermatology, Venereology and Dermatologic Surgery, Sofia, Bulgaria; Onkoderma, Private Clinic for Dermatologic Surgery, Sofia, Bulgaria. E-mail: georgi_tchernev@yahoo.de

Received: 26-Jul-2017; **Revised:** 14-Aug-2017; **Accepted:** 21-Aug-2017; **Online first:** 30-Dec-2017

Copyright: © 2018 Georgi Tchernev, Yavor Grigorov, Stanislav Philipov, Anastasiya Chokoeva, Uwe Wollina, Torello Lotti, Jose Cardoso, Irina Yungareva, Ilia Lozev, Georgi Konstantinov Maximov. This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

Funding: This research did not receive any financial support

Competing Interests: The authors have declared that no competing interests exist

BACKGROUND: Subungual exostosis is a relatively uncommon, benign osteocartilaginous tumor of the distal phalanx of the toes or fingers in young adults, considered as a rare variant of osteochondroma. Differential diagnoses include subungual verruca (viral wart), pyogenic granuloma, osteochondroma, amelanotic subungual melanoma and glomus tumour. Misdiagnosis and total onychodystrophy frequently occur as a result of late treatment or inadequate treatment strategy. Dermoscopy could be a useful technique, involved in the diagnostic process, although X-ray examination and histopathology are mandatory for the diagnosis.

CASE REPORT: We report a rare case of subungual exostosis of the great toe associated with repeated trauma of the nail bed. The lack of radiographic and histopathological examination could lead to misdiagnosis and inadequate treatment. Although completely benign, subungual exostosis should be considered in differential diagnosis of nail bed tumors in young adults, in order to avoid associated complications and unneeded aggressive surgical interventions.

CONCLUSION: Complete excision of the lesion and delicate separation from the underlying nail bed structures results in total resolve of the problem, by providing the lowest risk of recurrences.

Introduction

Subungual exostosis (SE) is a relatively uncommon, benign osteocartilaginous tumor of the distal phalanx of the toes or fingers, considered as a rare variant of osteochondroma [1][2].

First described by Dupuytren in 1847, SE is the most common nail tumor of young adults, representing a benign bony proliferation of the distal phalanx with unknown etiology [2][3].

The proposed possible triggering factors

include constant irritation of the bone, previous trauma and longstanding infection [1]. Two inherited conditions could be manifested as subungual exostosis, namely multiple exostoses syndrome and multiple exostoses-mental retardation syndromes [3]. Although completely benign, SE must be differentiated between a number of other subungual tumors, both benign and malignant [4]. There are increasing evidences of histological differences between subungual exostosis and subungual osteochondroma. Histologically, subungual exostosis has a fibrocartilaginous cap whereas osteochondroma has distinctive hyaline cartilage [5]. When the

diagnosis is made, simple surgical removal of the exostosis is effective and well-tolerated treatment option [6].

Case report

A 7-year-old otherwise healthy male patient presented with a small painful, raised skin lesion under the nail plate, on the medial edge of the right hallux, with one year history of duration.

A lobulated nodule of bony-hard consistency, measuring around 1 × 1 cm located on the medial aspect of the right great toe was established within the clinical examination. Elevation and destruction on the nail plate in the affected area was also presented (Fig. 1a).



Figure 1: 1a - Clinical manifestation of a subungual exostosis, presented as a firm, painful lesion, with eroded surface, on the medial aspect of the right great toe, under the distal half of the nail plate; 1b - X-ray examination of the foot showing mature bone projecting from the distal end of the terminal phalanx of the right hallux forming a Y-shaped bifurcation; 1c - Intraoperative images of a marginal excision of subungual exostosis of the great toe; 1d - The operative wound after resection of the exostosis. At the bottom - a well-rounded macroscopic intact bone, the incision is extended proximally to cure the medial part of the nail matrix in order to narrow the future nail and avoid its ingrowth

Mild pain was reported by the patient, when pressure was applied on the right great toe. A history of preceding chronic trauma was available, as the patient was a soccer player. The initial diagnostic consideration was a subungual verruca vulgaris. Radiography of the right foot revealed a lesion composed of mature bone stemming from the dorso-medial end of the terminal phalanx of the right hallux

forming a Y-shaped bifurcation (Fig. 1b). The lesion was excised under general anesthesia, with complete removal of the cartilaginous cap by curetting to normal trabecular bone (Fig. 1c,d). Histopathological examination of a fragment of excised lesion established mature trabecular bone covered by a well-developed fibrocartilaginous cap located in the deep dermis (Fig. 2a,b,c,d).

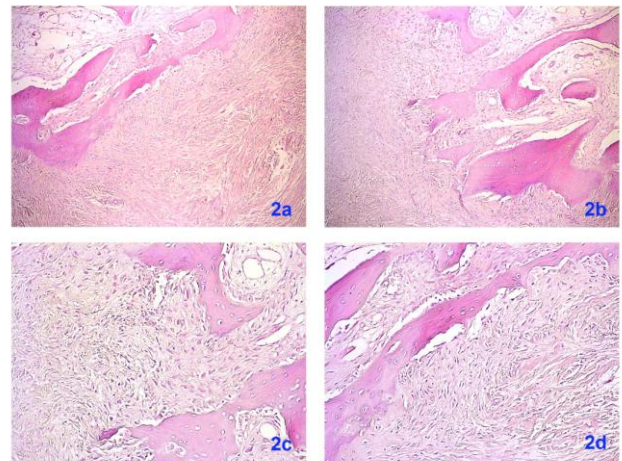


Figure 2: a, b – Histological findings (HE x100) - Loosely arranged spindle cells with mitotic activity, but no cytologic atypia, zonation (zonation phenomenon). The central cellular portion matures into trabecular bone surround by a well-developed fibrocartilaginous cap; 2c,d -(HE x 40) The lesion tends toward the periphery producing osteoid rimmed with osteoblasts

The morphological findings cover a large number of criteria for a histological profile of the underneath exostosis (underneath zone heteropic ossification). The clinical, radiographic and histopathological data support the diagnosis of subungual exostosis.

Discussion

Subungual exostosis is usually presented with a solitary lesion, which appears like a small firm lesion, located deep to the free edge of the nail in children and young adults [1].

The most common site of affection is the inner or medial aspect of the great toe, and less common SE could affect the fingers, especially the index and middle fingers [2][3]. Although it can occur at any age, half of the reported cases described patients under 20 years of age, with female predominance of the gender distribution [3].

Many possible causes have been implicated in the etiopathogenesis of SE, such as: trauma, chronic infections, tumor, hereditary abnormality, or activation of a cartilaginous cyst [4][6]. The condition may also represent cartilaginous metaplasia occurring

in response to acute or chronic irritation [7][8].

The differential diagnosis of subungual exostosis includes verruca vulgaris, subungual fibroma/fibrokeratoma, pyogenic granuloma, glomus tumor, subungual epidermal inclusion cyst, achromic malignant melanoma, squamous cell carcinoma of the nail bed, melanotic whitlow, osteogenic sarcoma and enchondroma [7]. Radiological findings may establish the diagnosis in the majority of cases [7]. Radiographically, the lesion is approximately 1 cm in diameter and projects from the dorsal or dorsomedial aspect of the distal portion of a terminal phalanx. It is composed of mature trabecular bone with attachment to the phalanx; the free end is flat, cupped and smooth, or irregular [9]. There is a large radiolucent cartilaginous cap [3]. There is no cortical disruption or other abnormality of the distal phalanx [9]. Dermoscopy could be another useful technique, involved in the diagnostic process, although X-ray examination and histopathology are mandatory for the diagnosis [10]. The dermoscopic features include vascular ectasia, hyperkeratosis, onycholysis, and ulceration [10].

Specific operative and nonoperative strategies vary widely and there are no articles comparing directly one technique with another. The most successful therapeutic approaches involved curettage, burr or rongeur debridement down to the base of the stalk to avoid recurrence, with preservation of the nail bed when possible [1][6].

We report a rare case of subungual exostosis on the great toe associated with repeated trauma of the nail bed. Although completely benign, the lack of radiographic and histopathological examination could lead to misdiagnosis and inadequate treatment. Delayed diagnosis occurred in approximately 10% of the cases and total onychodystrophy occurred in more than 10% of the patient as a result [1]. Complete

excision of the lesion and delicate separation from the underlying nail bed structures results in the lowest rate of recurrences and future complications.

References

1. DaCamba MP, Gupta SK, Ferri-de-Barros F. Subungual exostosis of the toes: a systematic review. *Clin Orthop Relat Res.* 2014; 472(4):1251-9. <https://doi.org/10.1007/s11999-013-3345-4> PMID:24146360 PMCID:PMC3940761
2. Aggarwal K, Gupta S, Jain VK, Mital A, Gupta S. Subungual exostosis. *Indian J Dermatol Venereol Leprol.* 2008; 74(2):173–174. <https://doi.org/10.4103/0378-6323.39722> PMID:18388393
3. Russell JD, Nance K, Nunley JR, Maher IA. Subungual exostosis. *Cutis.* 2016; 98(2):128-9. Dave S, Carounanidy U, Thappa DM, Jayanthi S. Subungual exostosis of the thumb. *Dermatol Online J.* 2004; 10(1):15.
4. Guarneri C, Guarneri F, Risitano G et al. Solitary asymptomatic nodule of the great toe. *Int J Dermatol.* 2005; 44: 245-247. <https://doi.org/10.1111/j.1365-4632.2004.02475.x> PMID:15807738
5. Tuzuner T, Kavak A, Parlak AH, Ustundag N. Subungual osteochondroma. *JAPMA.* 2006; 96(2):154 – 157. <https://doi.org/10.7547/0960154>
6. Letts M, Davidson D, Nizalik E. Subungual exostosis: diagnosis and treatment in children. *J Trauma.* 1998; 44(2):346-349. <https://doi.org/10.1097/00005373-199802000-00020> PMID:9498509
7. Ilyas W, Geskin L, Joseph AK, Seraly MP. Subungual exostosis of the third toe, *J Am Acad Dermatol.* 2001; 45(6 Suppl):S200–S201. <https://doi.org/10.1067/mjd.2001.102666> PMID:11712058
8. Resnick D, Kyria Kos M, Greenway GD. Tumors and tumor like lesions of bone: Imaging and pathology of specific lesions. In: Resnick D, ed. *Diagnosis of bone and joint disorders, Vol 6.* 3rd edn. Philadelphia: WB Saunders Company, 1995: 3628 - 3938.
9. Piccolo V, Argenziano G, Alessandrini AM, Russo T, Starace M, Piraccini BM. Dermoscopy of Subungual Exostosis: A Retrospective Study of 10 Patients. *Dermatology.* 2017; 233(1):80-85. <https://doi.org/10.1159/000471800> PMID:28482347