

Subungual Exostosis: A Case Report

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Abstract: *Subungual exostosis is a benign osteocartilaginous tumor of the ungual apparatus, particularly of the toes. This tumor presents as a firm swelling below the nail, which usually displaces the nail. It is often misdiagnosed leading to inadequate therapy. This case is of a 16 year female presenting with a lesion in the left great toe. The lesion was excised and the tissue was sent for histopathological examination, which showed evidence of subungual exostosis.*

Keywords: Subungual Exostosis, Toe, Lesion, Histopathological.

Introduction: Subungual exostosis may be defined as a solitary benign tumor of bone on the distal phalynx beneath the nail, first described by Duputyren in 1847 when he reviewed his experience with 30 patients afflicted with subungual exostosis of the great toe.¹ There is scant literature available regarding subungual exostosis. This lesion is not a true exocytosis but an outgrowth of normal bone tissue.¹ Nearly

80 percent of the reported cases involve the great toe.² It is considered to be a rare variant of osteochondroma.³ The great toe is involved in most of the cases but even the lesser toes and fingers may be affected.^{4,5} Subungual exostosis usually develops during adolescence and is more common in females than males.⁶ From clinical point of view, in typical cases, the subungual exostosis is usually a solitary lesion, which appears like a small firm lesion, usually located deep to the free edge of a nail. Pain, particularly severe on walking develops due to the collision of nail plate with the expanding exostosis. The overlying nail is pushed up and is finally detached; leading to a mass of fibrous tissue whose surface may be eroded and infected. The mass overlies the exostosis.⁶ The skin overlying an exostosis may become thickened like a callus and ulcerate with repeated trauma, pain being a prominent symptom.

Case History: A 16 year old female presented with the complaint of slowly

growing tender nodular growth under her left great toe nail for the last six to seven month. Earlier her toe was normal in appearance. There was no history of chronic infections or injury. The patient complained of pain at the site of lesion. The subungual nodular growth was measuring around 1x1cm, it was bony hard in consistency and was bit tender. Radiograph of the foot revealed and outgrowth of trabeculated bone with intact well-defined cortical margins. No destructive changes were noted to suggest the possibility of a malignant lesion. These radiological findings were consistent with the diagnosis of subungual exostosis. The

patient underwent excision of the exostosis with satisfactory relief of symptoms. The growth was sent to the Department of Pathology for histopathological analysis. The initial gross specimen was a grey brown tissue piece received in formalin measuring 1.0x0.8x 0.5cms. Histopathological analysis of the lesion showed a base of trabecular bone covered by a thin fibrocartilage cap consistent with diagnosis of subungual exostosis. Fig. 1 to 4 depicts the micrograph of subungual exostosis at various levels of magnification whereas fig. 5 shows the X-ray image of subungual exostosis.

Micrograph of excised tissue from the lesion showing the evidence of mature bone with a fibrocartilaginous cap deep in the dermis (H & E)

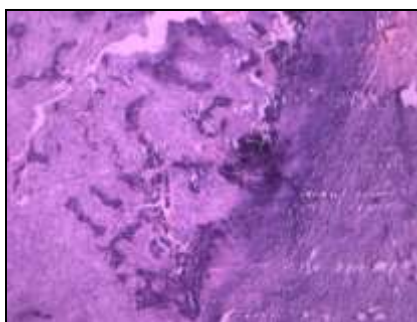


Fig. 1 (40x)

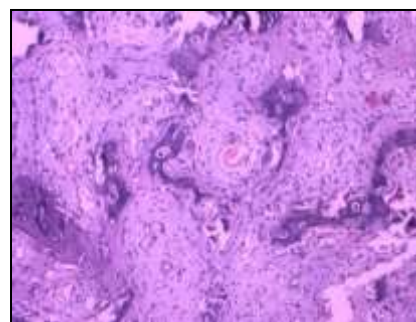


Fig. 2 – (100x)

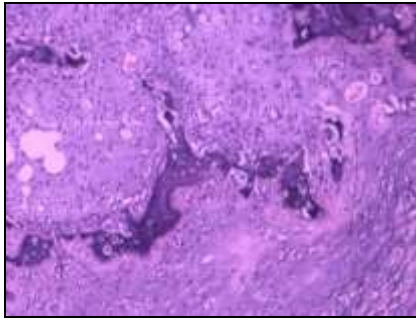


Fig. 3- (150x)

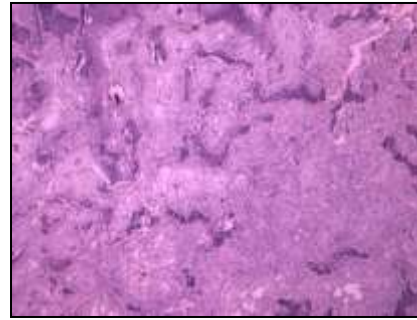


Fig. 4 - (200x)

Photograph of Subungual exostosis left great toe



Fig 5.

Discussion: Subungual exostosis is infrequent benign tumor, most commonly seen in the great toe in patient who is in the second to third decades of their life. Clinical manifestation includes pain, swelling and ulceration of the nail bed or surrounding tissue.

The pathogenesis of exostosis is not clearly understood, however the following have been suggested: trauma, teratogenic abnormality, association with multiple hereditary exostosis. Trauma is often a precipitating factor and subungual exostosis may represent cartilaginous metaplasia occurring in response to acute and chronic irritation.^{3,7} The recent

identification of chromosomal translocation $t(X;6)(q24-q26;q15-21)$ in short term cultured tumor cells strongly suggests that subungual exostosis is a neoplastic lesion caused by rearrangement of genes in the two breakpoints.⁸ In the early stages of the tumor development, the tumor consists of proliferating fibroblasts in direct continuity with nail bed where cartilaginous metaplasia can be seen. The cartilage undergoes ossification and ossifies. In the early stage proliferation of cartilage contributes to the exophytic growth of the lesion while later mature bone dominates the outgrowth.⁴ Diagnosis of subungual exostosis is made on plain

radiographs. On radiographs it appears as a trabecular bony outgrowth arising from the parent bone of terminal toe or finger. The cortex and medulla of outgrowth are continuous with the parent bone. The outgrowth has well defined cortical margins without any destruction of parent bone.⁹ Histologically, in the mature lesion, the picture is of a base of trabecular bone with a proliferating fibro cartilaginous cap. In immature lesions the cartilaginous cap is thick while the mature exostosis shows a thin cap of cartilage that has largely been replaced by trabecular bone.⁴ Treatment of subungual exostosis remains surgical.

Differential diagnosis of subungual exostosis include subungual verruca granuloma pyogeuicicum, glomus tumor, carcinoma of the nail bed, melanotic whitlow, keratokanthoma, subungual epidermoid inclusions and enchondroma, konen's tumor and ingrown toe nail.¹⁰ Mature trabeculae bone formation under the cartilage cap produces the appearance of an osteochondroma. However the location and spindle cell proliferation separate it from an osteochondroma. The subungual exostosis has a fibro-cartilage cap whereas the osteochondroma has a distinctive hyaline cartilage.¹¹ Like an exostosis an enchondroma may involve the distal phalynx. However, enchondromas

are cartilaginous tumors arising from the medullary cavity of tubular bones and appear on X Ray as radiolucent defects with expansion of bone.¹² Distintion from a subungual osteochondroma may be possible histologically because fibrous cartilage caps the bony outgrowth in exostosis and hyaline cartilage in osteochondroma.¹³

Conclusion: This case has been presented to illustrate the relatively uncommon case of subungual exostosis without proper histopathological and radiological examination the diagnosis can be mistaken and the treatment inadequate. The lesion must be distinguished from other malignant conditions. Treatment of subungual exostosis is surgical excision and removal of the lesion.

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