Subungual Squamous Cell Carcinoma of the Third Finger with Radiologic and Histopathologic Findings: A Report of Case

Erkan Inkaya · Emrah Sayit · Asli Tanrivermis Sayit ·
Elcin Zan · Mustafa Bakirtas

Received: 27 May 2014 / Accepted: 29 July 2014 / Published online: 5 August 2014
© Society of the Hand & Microsurgeons of India 2014

Keywords MRI · Nail bed · Subungual squamous cell carcinoma · Finger

We present the radiologic and histopathologic findings of a middle finger subungual SCC that does not involve the bone in an 84 year old woman.

Introduction

Although subungual squamous cell carcinoma (SCC) is a rare entity, it is the most common malignancy of the nail bed [1]. It is seen in men more often than women, and usually occurs in the fifth decade of life. It usually involves the thumb, the index finger and rarely, the toes (especially great toe) [2].

The subungual area is densely packed with connective tissues, vessels and nerves measuring 1–2 mm in thickness [3]. Approximately, 50 % of nail disorders are fungal infections [1] whereas the remainder consists of benign solid or cystic lesions and malignant neoplasms [3]. They may mimic each other causing a similar clinical picture. Therefore, the diagnosis of the SCC can be challenging and is often delayed jeopardizing the function preserving surgical approach. Imaging plays an indispensable role for identifying and characterizing lesions in this densely packed area.

Case Report

An 84 year-old woman presented with 1 year history of intermittent pain and discharge from the left middle finger nail bed. Examination of the left middle finger was unremarkable and discharge was not evident at that time. There was no skin discoloration, ulceration or deformity. There was no history of trauma or immunosuppression. Initial radiographic examination of the digit was unremarkable except mild osteopenia and degenerative changes attributable to patient's age (Fig. 1a, b). Particularly there was no osteolytic or osteosclerotic defect on the radiography. She was initially treated empirically with topical antifungal drugs owing to the most common pathology of the nail bed; onychomycosis. Due to persistent pain despite the treatment and lack of overt physical examination findings to explain the etiology, magnetic resonance imaging (MRI) was performed.

MRI of the hand showed a left middle finger subungual mass measuring 12x18mm with slightly low T1-weighted and slightly high T2-weighted signal intensity (Fig. 2a, b). There was no suppression on the fat saturation sequences indicating lack of fatty component (Fig. 3). Bone marrow signal of the adjacent digit was normal without cortical changes. Contrast material was not given due to deteriorating renal function of the patient (creatinine 1.9 mg/dl). The MRI findings were not definitive but differential diagnosis included chronic fungal nail bed infection (despite lack of treatment response), pyogenic granuloma and glomus tumor. Excisional biopsy of the nail and the lesion was performed (Fig. 4a, b). Histological examination revealed the diagnosis of differentiated squamous cell carcinoma (Fig. 5a, b). The patient underwent

E. Inkaya · E. Sayit
Department of Orthopaedics and Traumatology, Samsun Education and Research Hospital, Samsun, Turkey

A. T. Sayit (✉)
Department of Radiology, Samsun Gazi State Hospital, Samsun, Turkey
e-mail: draslitanrivermissayit@gmail.com

E. Zan
Russell H. Morgan Department of Radiology and Radiological Sciences, The Johns Hopkins Hospital, Baltimore, USA

M. Bakirtas
Department of Pathology, Samsun Education and Research Hospital, Samsun, Turkey

Fig. 1 a, b Anteroposterior and lateral direct radiography of the middle finger is normal except osteophytic degenerative changes

amputation of the left middle finger at the proximal interphalangeal joint. The postsurgical histological examination confirmed tumor free margins without bony involvement. The patient was lost to follow-up after 1 year of uneventful watch.

Discussion

Subungual SCC can arise from nail bed, nail matrix, nail groove or lateral folds [1]. The true incidence of the subungual SCC is unknown due to its rare occurrence. Risk factors include chronic infections, radiation exposure, human papillomavirus infection, burn scars, sun exposure, repeated trauma, immunosuppression and chronic dermatitis [4]. It occurs most commonly in the fifth decade of life and usually affects the thumb, index, middle, or ring finger in decreasing order, and, only rarely the toes [4]. Nonetheless, the literature has described synchronous involvement of multiple digits [5]. Bone involvement of the SCC is seen fewer than the 20 % cases [2].

Subungual SCC runs an indolent course and can cause very mild symptoms. Sometimes patients may present with

ulcerative lesions or insignificant swelling under the distal lateral edge of the nail. Nodularity, bleeding, ulceration, large exophytic mass, lack of antifungal or antibacterial treatment response are very suspicious. In particular, rapidly growing ulcerative lesions should strongly be considered for malignancy of the subungual region, especially the SCC [1].

Clinic features are not specific and may mimic benign entities such as viral warts, onychomycosis, paronychia, pyogenic granuloma, glomus tumor, subungual exostosis and osteomyelitis as well as malignant entities such as verrucous carcinoma, subungual keratoacanthoma and subungual metastasis [4]. None of the imaging modalities offer a definitive diagnosis for these differentials. Therefore, the patients are often misdiagnosed leading to an average delay of 4 years in definitive treatment noted in the literature [1]. In our case, mild pain and intermittent discharge were the symptoms and the definitive diagnosis took approximately 1 year. Pyogenic granuloma is a relatively common skin growth. It is a small, oozing and bleeding bump that looks reddish like raw meat. There is often a history of trauma and rapid growth within a few weeks. Verruca vulgaris can be seen as multiple hyperkeratotic and exophytic papules or nodules especially located

Fig. 2 **a, b** Axial (**a**) and sagittal (**b**) T2-weighted images of the middle finger show a subungual mass with non-homogeneous high signal intensity

Fig. 3 Coronal fat saturated T2-weighted image of the left hand show an abnormal signal intensity in the subungual area of the middle finger

Fig. 4 **a, b** Ulcerative lesion were seen in the nail bed, when remove the nail

on the palmar or dorsal side of the fingers [4]. Verrucous carcinomas are very rare and frequently seen in the six decade of life. They can be slow-growing, exophytic or fungating masses. Subungual keratoacanthoma is a rapidly growing and locally aggressive dome-shaped tumor. Some authors consider keratoacanthoma a subset of squamous cell carcinoma. But, keratoacanthoma often resolves spontaneously, and the treatment is often conservative. On the contrary, SCC does not recover spontaneously and not infrequently the treatment requires amputation the involved phalanges [2].

The lesions of the subungual space often mimic each other, necessitating the advanced imaging studies to depict the location and extent of tumor. Nonetheless, the clinical findings and initial radiograph of the hand in our case were nonspecific, but, lack of response to empirical treatment with longstanding pain were concerning. MRI was performed to investigate the possible soft tissue or bone masses in the subungual area which was inconclusive.

Fig. 5 **a** Photomicrograph of the histopathological specimen. Tumoral cells marked with an arrow have not reached to the bone yet, on the left side intact bone spicules are seen (H and E, $\times 100$). **b** Photomicrograph of the histopathological specimen shows severe cell infiltration around the tumor cells with atypia and mitosis (H and E, $\times 400$)

Direct radiography and computed tomography (CT) are useful to show SCC as a crescent-shaped soft tissue mass with osteolytic defect of the associated phalanx without periosteal reaction. Ultrasonography (US) and color Doppler US suffer from the small size of the subungual lesions [6]. A heterogeneous hypoechoic mass with irregular contours and posterior acoustic enhancement best represents the SCC. Color Doppler examination shows low-resistance pulsatile flow both at the center and periphery of the tumor. MR imaging is superior to the other radiologic imaging methods for the soft tissue masses with capability of identifying the exact location and extension and adds value in local staging for SCC [3]. Theodorou et al. presented a SCC in the lateral aspect of the fifth toe with homogeneous hypointense signal on T1-weighted images, intermediate signal on T2-weighted images with heterogeneous contrast enhancement [7]. Our case showed a slightly

irregular mass detected in the subungual area with low signal intensity on T1 and intermediate signal intensity on T2 weighted images. There was no abnormal intramedullary signal adjacent to the lesion swaying us from the osseous involvement. However one should consider possibility of minimal osseous invasion if there is fluid signal in the bone marrow even without erosion [3]. The definitive diagnosis sure requires histopathologic evaluation [3].

Currently, no standardized therapeutical approach has been established. The treatment of subungual SCC depends on the tumor size, extent and location. Moh's micrographic surgery can be used in the early stage of the disease. It is critical to obtain a clear margin with minimum amount of normal surrounding tissue to preserve functionality. Wide excision with no less than 4 mm of normal tissue from the margins of the tumor can be used for the lesions without bone involvement. The postsurgical reconstruction can be done with full thickness skin graft. However, amputation is the unfavorable treatment for the patients with bone involvement with the level depending on the extent of bone involvement [4]. We performed wide local excision with negative pathologic margins in accordance with the literature. Sentinel lymph node biopsy is not recommended as the axillary lymph node involvement and distant metastases are very rare. Local and regional recurrence rate is very low [1]. Radiation therapy can be recommended in unresectable lesions after obtaining a pathological confirmation [4].

Conclusion

Subungual SCC is the most common malignancy of the subungual space but luckily is a rare entity. Delayed diagnosis of this entity is almost inevitable due to non-specific clinical presentation and imaging characteristics. Our aim was to raise the awareness of malignancy and in particular the SCC of the subungual region in patients who do not benefit from conservative treatment. A biopsy should be encouraged in those patients for definitive diagnosis. Unlike its counterparts in the head and neck or the chest, the SCC of the subungual space is a locoregionally limited malignancy. Early diagnosis is still crucial offering limited phalanx amputation to preserve functionality.

Conflict of Interest The authors declare that there are no conflicts of interest related to the subject matter or materials discussed in this article.

Financial relationship We have no financial relationship.

References

1. Sever C, Kulacı Y, Oksuz S (2012) Subungual squamous cell carcinoma masquerading as an onychomycosis. *J Clin Anal Med* 3:231–233
2. Bui-Mansfield LT, Pulcini JP, Rose S (2005) Subungual squamous cell carcinoma of the finger. *AJR* 185:174–175
3. Baek HJ, Lee SJ, Cho KH et al (2010) Subungual tumors: clinico-pathologic correlation with US and MR imaging findings. *Radiographics* 30:1621–1636
4. Arumugam M (2007) Squamous cell carcinoma of the thumb nail bed. *Indian J Dermatol Venereol Leprol* 73:445
5. Abner S, Redstone J, Chowdhry S, Kasdan ML, Wilhelmi BJ (2011) Synchronous squamous cell carcinoma in multiple digits. *Eplasty* 11:e9
6. Wortsman X, Merino D, Catalan V et al (2010) Perineurioma of the nail on sonography. *J Ultrasound Med* 29:1379–1382
7. Theodorou SJ, Theodorou DJ, Bona SJ et al (2005) Primary squamous cell carcinoma: an incidental toe mass. *AJR* 184:110–111