

Case Report

An Innovation in the Management of Osteolytic Lesions in Distal Phalanges of Digits

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Abstract

Osteolytic lesions in hand is not uncommon finding. But the occurrence of these bony lesions in distal phalanx is quite rare. The differential diagnosis includes both the benign and malignant tumors which can be primary or secondary. Clinical and radiological examination can very well differentiate between benign and malignancy, but always histopathological examination is a must for final diagnosis. Here is a case report of a distal phalanx osteolytic lesion which was managed in an entirely different way from the traditional technique.

Introduction

Osteolytic lesions of the distal phalanges of the digits have remained uncommon entities. Intraosseous epidermoid inclusion cyst is an exceedingly rare entity, especially in thumb, and may arise as the result of previous digital trauma given the unique regional anatomy of the terminal phalanx. Only a few cases of epidermal inclusions cysts of hand phalanges have been reported in Orthopedic literatures. The preferred treatment has always been surgical curettage and bone grafting of the resultant defect which has acceptable outcome.

Case Report

36-year-old man, with no known chronic illnesses, presented to our clinic with 2 months history of slow growing swelling of the tip of his right thumb. It was asymptomatic and did not cause any kind of disability. He did not recollect any prior traumatic events and there were no similar swellings in other digits or anywhere else. His musculoskeletal examination was insignificant. Examination of his right thumb revealed a diffuse ill-defined swelling of the tip of his right thumb, beneath the nail bed which pushing the nail apparatus dorsally (Figure 1).



Figure 1: X ray showed well defined osteolytic lesion of distal phalanx without any periosteal reaction or violation of surrounding soft tissues.

He had no tenderness, no skin changes. He had normal range of motion in his interphalangeal joint. Preoperative radiographs demonstrated a well circumscribed, lytic, expansible lesion occupying the distal half of the of the distal phalanx with cortical thinning and no pathological fracture. Preoperative imaging suggested a benign cartilage tumor. Given the clinical and radiographic findings, the patient was indicated for operative intervention. We performed intra lesional curettage of the lesion through dorsal approach, after raising the nail bed and the defect was filled with calcium chips which has osteo inductive property

and was covered with Matriderm so as to prevent inflammatory reaction and scarring of the nail bed. Matriderm was placed in the plane between calcium chips and nail bed, which was repaired meticulously with 6-0 vicryl sutures. Nail plate was placed back and secured, and the interphalangeal joint was splinted for two weeks postoperatively (Figure 2).



Figure 2: X-ray done one week postoperatively showing how was the gap filled with calcium chips.

Histopathological analysis demonstrated the presence of stratified squamous cell epithelium with prominent keratinization, consistent with a diagnosis of an intraosseous epidermal inclusion cyst. There was no evidence of chondrocytes or cartilaginous tissue to support a diagnosis of enchondroma or any other benign lesions. Postoperatively, the recovery was uneventful. Patient was followed up regularly. Radiographic images, preoperatively, 2 weeks and 9 months postoperatively are given, which show good new bone formation and a soft tissue photograph demonstrating completely normal nail plate and nail bed at 9 months postoperatively, as well (Figure 3).



Figure 3: There was clear new bony formation on X-ray.

Discussion

The differential diagnoses of hand phalangeal lesions consist many including inflammatory processes, benign or malignant tumors. Location of the lesion along the longitudinal axis of the bone plays a role in the diagnosis. Enchondromas (benign cartilage tumor) or intraosseous synovial cysts are commonly located proximally, while cystic lesions including those secondary to tophaceous gout or a localized giant cell tumor of tendon sheath, aneurysmal bone cyst, osteoid osteoma, giant cell reparative granuloma, simple bone cyst, and epidermoid inclusion cyst are commonly distally based. Primary malignant lesions are very rare to arise in distal phalanges. Metastatic tumors are still remaining a diagnostic consideration, with most common being metastatic lung carcinoma. Epidermal Inclusion Cysts (EIC) of the bone is a rare entity, with most commonly appearing in hand and skull [1-3, 4,5] but have been reported in the toes as well [6,7].

Patients will be complaining mostly of pain. In a review of 10 cases of EIC, (distal phalanges of the hand, n = 9; toe, n = 1), Roth [4] observed that pain was the most common presenting symptom. Swelling and nail plate deformity are less common symptoms [5]. The average age of presentation is approximately 30-50 [4,5], but cases have been reported in children as young as 8 years old [3]. The lesions more commonly appear in men than women [4, 5]. The etiology of this condition not very well understood. Though a congenital etiology with intra osseous inclusion of embryonic epithelial tissue has been proposed [5], theory of post-traumatic displacement of superficial epithelial cells into underlying osseous compartment remains most prevalent, since most of the patients recall an antecedent traumatic event.

Radiographically, intraosseous EIC typically presents as a well-defined osteolytic lesion without any trabecular pattern There may be cortical thinning or erosion, and typically bony sclerosis or reaction is absent [1, 4,6,7]. These lesions are typically located in the distal aspect of distal phalanges. Definitive diagnosis is made almost always by tissue histopathology and the preferred treatment is Surgical intra-lesional curettage with or without bone graft [1,3,4,6]. Recovery is uneventful most of the time, but patients may end up with nail plate deformity because of nail bed scarring, post operatively.

We decided to experiment with Matriderm and calcium chips in this particular case because of few reasons.

1. Patient is right hand dominant, immobilizing the right thumb for longer periods to aid bone graft intake would significantly delay his return to work.
2. A relatively big defect with no intact bone distal to it, to support the graft, would significantly reduce the chance of graft intake.
3. Bone graft should be removed in case the histopathological examination of the lesion shows any dysplastic changes.
4. This technique leaves no chance for donor site morbidity, as well.

We find this as very promising technique since use of Matriderm dramatically changed the expected outcome in terms of cosmetic and functional.

MATRIDERM is a single-use three-dimensional matrix composed of native structurally intact collagen fibrils and elastin for supporting dermal regeneration. The collagen is obtained from bovine dermis and contains the dermal collagen types I, III, and V. The elastin is obtained from bovine nuchal ligament by hydrolysis. MATRIDERM serves as a scaffold in the skin reconstitution and modulates scar tissue formation. Moreover, MATRIDERM has an excellent haemostatic property and thus reduces the risk of hematoma. The non-use of chemical cross linking of the collagen results in a matrix that is especially biocompatible. In addition, MATRIDERM is a collagen matrix of acellular nature. The collagen serves as a “scaffold” to promote cell growth and vascularization. Matriderm has been used widely in the management of burn wounds.

Conclusion

Epidermal inclusion cyst of phalanges of hand is an exceedingly rare entity. We should consider other entities like enchondroma, giant cell tumor or simple bone cyst while encountering patients with phalangeal lesions. History of previous traumatic events to the affected digits makes diagnosis of EIC more likely, as well as the distally based location of the lesion in the longitudinal axis of the phalanx. Definitive diagnosis is made by tissue histopathology

and the treatment is always surgical curettage. Reconstruction of the bony defect using calcium chips covered with Matriderm is a very good alternative to traditional bone grafting since it gives superior cosmetic and functional outcome.

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