Case Report

Onychocryptosis complicated with osteomyelitis – A case report from tertiary wound care center in South India

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ABSTRACT

Onychocryptosis or in-grown nail is a painful condition caused by the nail plate's penetration into the soft surrounding tissue. If left untreated, it leads to infection, discharge, and difficulty in walking, seriously impeding the quality of life of the person. We present a case study of 26-year-old male non-diabetic, in-grown toenail involving the right great toe with osteomyelitis and lymphedema in the right leg. Onychectomy was performed to the patient's right great toe followed by bone curettage to remove the infected bone. The patient was prescribed with analgesics and antibiotics and he was under constant medical follow- up once a week to change the dressing. Consecutive and careful administration revealed that the growth of healthy matrix and lymphedema is significantly under control.

Key words: Ingrown toenail, Matricectomy, Onychocryptosis, Osteomyelitis

Ingrown toenails or onychocryptosis occur when the periungual skin is punctured by its corresponding nail plate, resulting in a cascade of foreign body, inflammatory, infectious, and reparative processes [1]. This may result in a painful, draining, and foul-smelling lesion of the involved toe (most commonly, the hallux nail), with soft- tissue hypertrophy around the nail plate. Past studies reported that the prevalence can be as high as 2.5–5% [2]. This condition occurs most often in teenagers and young adult males between the ages of 15 and 40 years; with a male to female ratio of 3:1 [3]. Most common causes of ingrown toenails are improper trimming, repetitive or inadvertent trauma, genetic predisposition, hyperhidrosis, poor foot hygiene, wearing tight shoes, obesity, and differential growth of nails and toes during puberty [1,4].

CASE REPORT

A 26-year-old male presented to a tertiary care center in Chennai, with complaints of pain and irritability in the right great toe for 2 days. The tissues surrounding the nail were inflamed resulting in the pain with which the patient presented. There was no purulent discharge. The remaining toenails were free of deformity and within normal limits for length, thickness, and coloration. The nail on the great toe on the left side was normal. The patient had a history of partial matricectomy done elsewhere in the right great toe a year ago.

On general examination, the vitals were stable. Local examination of the patient revealed bilateral lower limb swelling, lymphatic obstruction, deep venous reflux, in-growing nail in the right great toe with paronychia, and ingrown toenail with osteomyelitis suggesting recurrent incidence in the same region with granulating tissue (Fig. 1).

Biochemical reports of the patient were observed to be normal but lymphoscintigraphy revealed the presence of Grade II lymphedema. The Duplex and color flow mapping of both the lower limbs revealed the presence of chronic venous insufficiency in the right thigh and the right leg in the zone of influence of greater saphenous vein. Radiological investigation revealed alterations in the distal phalanx of the right great toe indicating osteomyelitis of the right distal phalanx (Fig. 2).

The lymphatic pump was performed in the patient to stimulate the flow of excess lymph out of the affected limb and to relieve the lymphedema in the right leg. Complete onychectomy was performed to the patient's right great toe. An oblique incision was made at each apex of the nail plate, and the cuticle, eponychium, and proximal nail matrix were incised. The toenail was grasped with a hemostat and avulsed. The nail matrix was excised, and the lateral nail grooves were also released. Bone curettage was accomplished in the same to remove the infected bone, which was excised with the bone nibbler from the ulcer incision. The

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Figure 1: In-growing nail in the right great toe with paronychia and granulating tissue

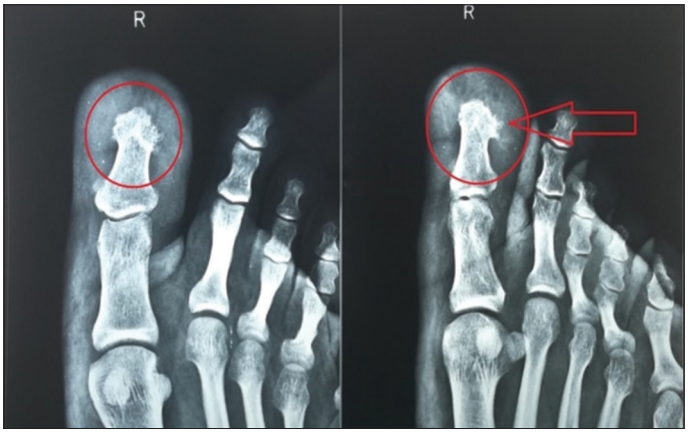

Figure 2: X-ray of the foot showing alterations in the distal phalanx of right great toe indicating osteomyelitis of the right distal phalanx

skin was closed with interrupted sutures with a sterile dressing (Fig. 3).

The patient was advised to take analgesics and antibiotics and was under constant follow-up. He was advised to change the dressing once a week (Fig. 4a). Six weeks post-surgery, the toenail healed with a healthy matrix, and the nail is growing well (Fig. 4b).

DISCUSSION

In-growing toenail, also called as the embedded toe or unguis incarnates, is an acquired condition of usually the great toe. The most commonly affected toenails are the hallux toenails and the involvement of the lateral toe edge occurs twice as compared to the medial side [2,5]. The most frequent symptoms are pain, swelling, redness, and suppuration and in severe cases of prolonged nail infection, the process involved the underlying bone causing secondary osteomyelitis may be observed [6].

The most common etiological factor responsible for onychocryptosis is the improper nail trimming as it leads to a nail spike that traumatizes adjacent soft tissue. Other predisposing factors responsible for the condition are tight-fitting shoes, bad foot

Figure 3: Interrupted sutures were placed at the wound with a sterile dressing

Figure 4: Follow-up of the patient after (a) 1 week and (b) 6 weeks post-surgery. At 6 weeks, the toe nail was healed with healthy matrix

hygiene, hyperhidrosis, trauma, and the use of some medications, especially epidermal growth factor receptor inhibitors (gefitinib and cetuximab) [1,7]. Apart from the etiological factors, there are several risk factors that can also predispose the condition such as pincer-nail deformity, wide nail plates, congenital malalignment of the toenails, and thickening of the nail plate [7,8]. Regarding its pathogenesis, onychocryptosis occurs when the lateral nail fold is penetrated by the edge of the nail plate resulting in a cascade of reactions starting from pain, sepsis and, the formation of granulation tissue [9].

An ingrown toenail is not difficult to diagnose as the diagnosis is based on clinical features only and does not require any laboratory or radiographic tests. In the present case, the patient was diagnosed to have lymphedema and the lymphoscintigraphy proved the same. Lymphoscintigraphy is widely considered to be the main investigation to establish the diagnosis of lymphedema and visualize peripheral lymphatics. Differential diagnosis includes subungual exostosis, primary osteomyelitis of the phalanx and tumors of the nail bed, including subungual melanoma [10,11].

Similar to our case reports, various case reports are present in the literature [6,12,13]. Cox and Jones in their case series reported three cases of direct extension osteomyelitis secondary to chronic onychocryptosis which was similar to our case [6]. Ko and Lipner presented the case of a 67-year-old man with a 30-year history of severe thickening, abnormal growth, and yellow discoloration of his left great toenail [12]. A case report of ingrown toenail

involving the right great toe with a swelling in the same toe with occasional pain was reported by Samy [13].

Treatment of the condition depends on the stage of the ingrown nail, prior modalities of treatment in case of recurrence, and other factors. The treatment procedures may range from conservative to minor surgery ranging from simple incision and drainage of the abscess, the partial matricectomy, nail avulsion, and radical excision of the nail. Heifetz and Frost classified ingrown toenails in three stages [14]. Conservative measures are recommended in mild to moderate cases (Stages 1 and 2), whereas severe lesions causing disability (Stage 3) require surgical methods [5,15]. In the present case, initially the patient underwent a partial matricectomy a year ago but later on due to the recurrence of the lesion, he underwent complete onychectomy of the right toe. Aguilar *et al.* reported a case of a 25-year onychocryptosis that did not respond to conservative management and was extracted with partial matricectomy of the nail [16].

CONCLUSION

The ingrown toenail continues to be a common source of morbidity and has a significant impact on the quality of life of an individual. At present, a mass public health campaign is very much required to educate teenagers and young adults on how to cut their nails, to avoid wearing tight short shoes, and always keep the foot clean and dry to prevent the development of in-grown toenail.

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