

A new concept for management of ingrown toenail

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Abstract

Background: Ingrown toenails occur when the peri-ungual skin is punctured by its corresponding nail plate, surgical management of this process still creates a problem about the ideal therapy for its management, we report here a new procedure for its management.

Patients and methods: This study included n=18 patients aged from 21 years to 42 with a mean age 26 ± 0.2 years, in the period between March 2010 to December 2010. All the patients were consulted for pain with or without infected granulation tissue in the lateral nail fold in n= 8, medial folds in n= 6 patients and in n=4 on both sides of the big toe. Under local anesthesia or general all the patients were operated on with a long V shaped excision in the middle aspect of the nail.

Results: Minimal postoperative pain and bleeding occurred according to the visual analogue score, the patients started to walk normally with a well weight bearing after 7days. Time off work ranged from 7 to 10 days with a mean duration 7.5 days. Complete wound nail healing occurred in 14 to 18 days, mean $[11 \pm 1.2]$ and one case developed postoperative recurrence through the period of follow up (mean 7.4 m), range from 6 to 12 months.

Conclusion: Midline V shaped excision of the nail gives us an alternative tool for management of ingrowing nail with less pain and rapid healing.

Introduction:

Ingrown toenails occur when the periungual skin is punctured by its corresponding nail plate, resulting in a cascade of foreign body, inflammatory, infectious, and reparative processes. Ultimately, 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.¹

Anatomic and behavioral factors that may predispose to onychocryptosis may include incorrect methods of nail trimming, repetitive or unintentional trauma, genetic risk factors, hyperhidrosis, and poor foot hygiene. Wider nail folds and thinner, flatter nails are thought to increase the risk for ingrown toenails, but this is still unproven.

Partial nail avulsion combined with phenolization is more effective at preventing symptomatic recurrence of ingrown toenails versus surgical excision of the nail without

phenolization, but it carries a slightly increased risk for postoperative infection (level of evidence, B).³

The aim of this study is to avoid the recurrence rate that occurred after lateral nail avulsion and the high incidence of infection that may follow the phenolization.

Patients and methods:

In outpatients clinic in Zagazig University Hospital, this study included n=18 patients aged from 21 years to 42 with a mean age 26 ± 0.2 years, in the period between March 2010 to December 2010. All the patients presented with or without infected granulation tissue, in the lateral nail fold in n= 8, medial folds in n= 6 patients and in n=4 on both sides of the big toe **Table(1)**. Under local anesthesia or general all the patients were operated with a long V shaped excision in the middle aspect of the nail that was deepened to the bed about 3mm at the nail base **Figures(1,2,3)**. After

excision of the convex nail part, the two sides of the nail should be approximated with a towel clips **Figure(4,5)**, then one to three sutures were done. The sutures were removed after two weeks for all patients. All patients undergoing toenail surgery should receive one gm cephalosporin pre and postoperative and appropriate education regarding postoperative care.

The entire procedure was performed in an outpatient clinic and took approximately fifteen to thirty minutes depending on the extent of the problem. Either in one leg or both legs with a mean period 20 ± 0.3 minutes. The patients were allowed to go home immediately, immediate walking was allowed after one day, walking with weight bearing was allowed after one week.

Results:

There was minimal blood loss and pain according to the visual analogue score. One ampoule voltaren postoperative was sufficient once after the operation. Two patients received one injection daily for three days postoperatively.

One case developed postoperative recurrence through the period of follow up (mean 7.4 m) range from 6 to 12 months. The patients started to walk 24 to 48 hours according to the severity of the case and presence or absence of infections. Only two patient's stated walking after one week.

Walking with a wight bearing was allowed after one week to ten days. Time off work ranged from 7 to 10 days with a mean duration 7.5 days. One case of postoperative recurrence through the period of follow up ranged from 6 to 12 months (mean 7.4 m). Complete wound nail healing occurred in 14 to 18 days mean $[11 \pm 1.2]$ **Table(2)**.

Table (1): Demographic data.

| | |
|-----------------------------|--------------------|
| Number mean | 18 |
| age of patients | 26 ± 0.2 years |
| Males/ female | 12 /6 patients |
| Lateral nail bed | 8 patients |
| Medial | 6 |
| Both sides | 4 |
| Walking with weight bearing | 7- 10 days |

Table (2): Operative results.

| | |
|--------------------------------------|-------------------------|
| Operative time | 15-30 (20 ± 0.3 m) |
| Mean time off work | 7.5 ± 1.2 days |
| No. of patients with delayed walking | 2 (11.1%) |
| Recurrence | 1 (5.5%) |
| Cure rate | 16 (89%) |
| Complete nail healing (d) | 14-18 (11.2) |
| Mean follow up time | 7.4 months |



Figure (1): Midline incision; V shaped excision of the nail base of the left toe.

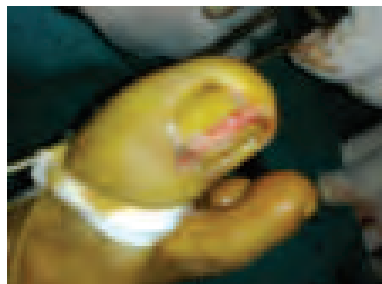


Figure (2): Midline incision; V shaped excision of the nail base of the right toe.



Figure (3): After one week with three sutures at the nail base and two at its middle.



Figure (4): After two weeks with removed stitches.

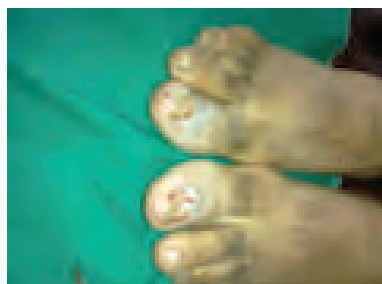


Figure (5): Patient with bilateral ingrowing nail.



Figure (6): After four weeks with healed nail matrix.

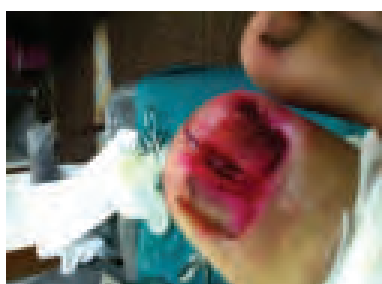


Figure (7): Patient 33 years with ingrowing nail after V shaped excision of the nail.



Figure (8): The artery marks the site of ingrowing nail which was immediately released from the pressure.

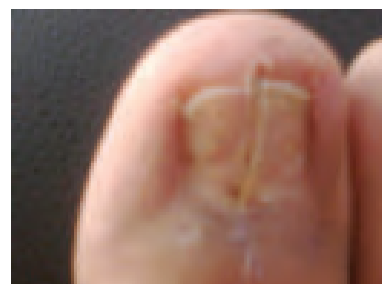


Figure (9): Postoperative picture after one month with healed nail bed.

Discussion:

When conservative therapy fails for initial management of moderate to severe onychocryptosis, surgical treatments may be appropriate, such as partial nail avulsion or complete nail excision with or without phenolization.^{1,3}

One of the pathological effect of an ingrowing nail is the pressure effect on the skin and soft tissue around it that leads to its damage, and so on swelling, redness and infection onychocryptosis.¹ Controversy is still present about the initiating pathology either

the nail problem is the cause of a round soft tissue inflammation or the inflamed soft tissue, pressure and trauma is the first pathology that leads to ingrowing nail.

Vandenbos and Bowers theorized that pressure necrosis of the soft tissues surrounding the nail due to weight-bearing is the primary cause of ingrowing toenails and the initial cause of this condition is due to the procedure of nail trimming in a curved or rounded fashion instead of straight across, that leads to further bulging of soft tissue, and as the nail grows out, pressure necrosis of soft tissue occurs.

According to the thesis of Vandedbos and Bowers they suggested that ingrowing nail treatment by removal of a segment of nail is not rational. It increases the relative amount of soft tissue and predisposes to recurrence and at the same time inept attempts to remove some nail matrix lead to faulty regrowth of the nail. The soft tissue should be excised, so that with weight bearing there will be no tissue to bulge up across the nail.³

In spite of the above theory³ where the nail is not the problem of ingrown toenail and too much skin around the nail ("overgrown foreskin") is actually the cause, their results were depending on the complete excision of the skin all around the nail about one cm breadth, versus our study where we focused on the nail as it is the main problem thus after V shaped excision of the convex nail part it will lead to more straightening and curves the nail away from both skin folds.

The skin and soft tissue removal need, more time of bed rest, more analgesics and delay return to work in comparison to our study with less postoperative pain and rapid return to work in spite of the nearly same results regarding recurrence in both studies. One study only compared patients with ingrown toenails to healthy controls and found no difference in the shape of toenails between patients and controls and suggested that treatment should not be based on the correction of a non-existent nail deformity.^{4,5}

We agree with a previous study that was published that, the nail deformity is the main cause for the existing pathology.⁶

Whether the pathology is due to overgrown foreskin" or due to nail problem we aimed to manage the nail convexity through midline V shaped nail bed excision followed by deviating of both nail sides toward the midline to correct nail growth direction on both sides. This is versus the common procedure about marginal nail avulsion with phenolisation. The point of the procedure is that the nail does not grow back where the matrix has been cauterized and so the chances of further ingrowths are very low. One of the disadvantages of the other procedure, if the application of the phenol was improperly performed or an insufficient quantity of phenol was applied to the afflicted

area; the nail matrix can regenerate from its partial cauterization and grow new nail. This will result in a recurrence of the ingrown nail in approximately 4-6 months. Also this procedure if it recurred, the shape of the nail become irregular, too thick and curved.

Other solution of this problem is through placing a small piece of cotton under the affected area of the nail but this way can help the mild cases as it allows the nail to grow back out from underneath the skin and it is ineffective in advanced cases and may only works in the early stages. Some authors will not perform a complete nail avulsion (removal) except under the most extreme circumstances and preferred to remove both sides of a toenail (even if one side is not currently ingrown) and coat the nail matrix on both of those sides with a chemical or acid (usually phenol) to prevent re-growth.⁸ One of the advantages of this study is the mild postoperative pain and also the ability to walk after 24-48 hours and rapid return to work after an average 7-10 (7.5 d), versus other procedures,⁶ it is advisable to leave at least four days before walking any further than very short distances. Even with painkillers this can be exceedingly painful. It is also important to be aware that the patient may be unable to work for 1-2 weeks (at most) depending on the speed of recovery.⁸

References

- 1- Chapeskie H: Ingrown toenail or overgrown. *Canadian Family Physician* 2008; 54 (11): 1561-1562.
- 2- Pearson HJ, Bury RN, Wapples J, Watkin DF: Ingrowing nail, is there a nail abnormality. *J Bone Joint Surg Br* 1987; 69 (5): 840-842.
- 3- Vandenbos KQ, Bowers WP: Ingrown toenail as a result of weight bearing. *US Armed Forces Medical Journal* 1959; 10 (10): 1168-1173.
- 4- Aksakal AB, Ozsoy E, Güreş M: Silicon gel sheeting for management and prevention of onychocryptosis. *Dermatol Surg* 2003; 29 (3): 261-264.
- 5- Boll OF: Surgical correction of ingrowing toenails. *J Natl Assoc Chiropr* 1945; 35: 8-9.

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- 6- Kominsky SJ, Daniels MD: A modified approach to the phenol and alcohol chemocqal partial matrixectomy. *J Am Podiatr Med Assoc* 2000; 90(4): 208-210
 - 7- Boberg JS, Frederiksen MS, Harton FM: *J Am Podiatr Med Assoc* 2002; 92 (10): 575-579.
 - 8- Hausman MR, SP Lisser: Hand infections. *Ortho Clin North Am* 1992; 23: 171-185.