

ORIGINAL ARTICLE

TREATMENT OF INGROWN TOE NAIL-COMPARISON OF PHENOLIZATION AFTER PARTIAL NAIL AVULSION AND PARTIAL NAIL AVULSION ALONE

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Background: Ingrown toe nail is common problem presenting to the surgeon. Partial Nail avulsion only results in recurrence of the ingrown toe nail. The aim of this study was to see the effect of phenolization in preventing recurrence after partial nail avulsion. **Methods:** This was a randomized controlled trial carried out at Department of Surgery, Pakistan Institute of Medical Sciences, Islamabad. This study included 100 patients (50 in each group) with ingrown toe nail presented from November 2009 to October 2010. This study compared the application of phenol after partial avulsion with partial avulsion alone in the treatment of ingrown toe nail. **Results:** Sixty-nine percent of the patients were males and 31% were female. The mean age in both groups was 18 years. Patient in the partial nail avulsion with application of phenol group had less pain as compared to patient with partial nail avulsion group only. Our study has shown that patient in phenol group had less post operative infection, spike formation and recurrence as compared to wedge resection group only. **Conclusion:** Partial nail avulsion with phenolization is better than partial nail avulsion only for the management of the in-growing toe nail.

Keywords: Ingrowing toe nail, Wedge resection, Chemical matricectomy

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INTRODUCTION

In-growing toe nail or onychocryptosis is a painful condition of foot in which the edge of a nail, usually the big toe nail, grows into the surrounding soft tissue (paronychia) causing inflammation and subsequent infection.¹ It is the commonest condition of foot presenting to a surgeon. Ingrown toenails are frequently encountered in clinical practice, with an estimated 10000 new cases per year in the United Kingdom.² Approximately 20 percent of patients presenting to doctor with a foot problem have an ingrown toenail.³ It can occur at any age but common in young people, immunocompromised status and peripheral vascular disease.⁴ The usual presentation is pain in the affected nail with progression to drainage, infection, and difficulty in walking. It results in significant morbidity which has economic impact, secondary to decreased mobility and work absenteeism.

A wide range of conservative and surgical methods are available for the treatment of Ingrown toe nail. These options include simple incision & drainage of the abscess, the partial nail excision (wedge resection), nail avulsion and radical excision (Zaddik's procedure) of the nail. But the surgical treatment only is associated with high recurrence rate.⁵ Studies have shown that application of phenol after partial nail avulsion reduces the recurrence rate to 0-4.4%.⁶ Application of the phenol after partial

nail avulsion chemically destroys the matrix and prevents the recurrence of the ingrowing toe nail.

Review of literature shows better results of partial nail avulsion and phenolization compared with other surgical options. We have large number of patients presenting to our surgical outdoor clinics with in grown toe nail. The aim of present study is to compare the use of phenolization after partial nail avulsion and see the response of the treatment in order to develop some local guidelines in our scenario.

MATERIAL AND METHODS

This was a randomized control trial, conducted at Pakistan Institute of Medical Sciences, Islamabad. It included 100 patients with ingrown toe nail presenting from November 2009 to April 2010. The sample size of 99 was determined Using WHO sample size calculator where, Confidence level was taken at 95%, Absolute precision (d) equal to 0.06, P1 (recurrent rate of IGTV after phenolization) equal to 4.3%, P2 (recurrent rate of IGTV after matrix excision) to be 5.4%. Fifty patients each in either group-A or B were randomly allocated using lottery method. Group-A included patients who had partial nail avulsion with application of the phenol (phenolization) while Group-B included patients who had partial nail avulsion alone. Well understood informed written consent was obtained from all patients undergoing partial nail avulsion and phenolization. All patients were informed about

inclusion in study, the procedure, its benefits and risks involved.

The procedures were performed as a day case procedure. A cotton ball soaked in 80% phenol was applied to the nail bed underneath the nail fold for 1 minute after the partial nail avulsion in phenolisation group. This was repeated once, and the residual phenol was then neutralized with 70% isopropyl alcohol. Visual analogue scale (VAS) was used in our study as scoring system for pain.

The relevant data collected on a well-structured pro forma. It included personal profile of the patient and findings of local clinical examination. Postoperatively patients were followed up in outdoor clinics on 3rd and 7th day for pain and infection and after one month and 6 months for recurrence or spike formation.

Data was compiled and analyzed using SPSS-16. Chi square test was applied at 5% level of significance to compare recurrence rate and spike formation phenolization and matrix excision. A *p*-value less than 0.05 was considered as significant.

RESULTS

The results showed that ingrown toe nail affected males more frequently 69% as compared to females 31%. The male to female ratio was 2.3:1. Most of the patient included in the study were teen agers and were of school and college going age (Figure-1). The mean age in both groups was 18 years and the age range was 14–45 years. Patients in phenol group had experienced less pain as compared to partial nail avulsion alone group (Table-1). The *p*-value for pain at 3rd day between two groups is 0.018 which is significant and shows that phenol group has significant less pain at 3rd day as compared to partial nail avulsion alone group. In contrast to this the *p*-value for pain at 7th day is 0.64 showing insignificant difference

Postoperatively 16% of the patients had wound after partial nail avulsion infection. Out of these 4% of the patients were from the phenol application group and 12% patients were from the partial nail only group (Table-2). The *p*-value is 0.029 which is significant and shows that patient who had application of phenol after nail avulsion had less infection as compared to partial nail avulsion alone group.

Follow up of these patients after one and 6 months revealed that 5% patients had spike formation and all of them belonged to the partial nail avulsion alone group (Table-2). 8% of the patients had recurrent ingrown toe nail from which only 1% patient belonged to the phenol group and rest of the 7 patients who had recurrent ingrown toe nail were from the partial nail avulsion alone group (Table-2).

The *p*-value for spike formation was 0.022 and for recurrent disease was 0.027. These vales are significant and showed that partial avulsion with phenol application had better result as compared to partial nail avulsion alone.

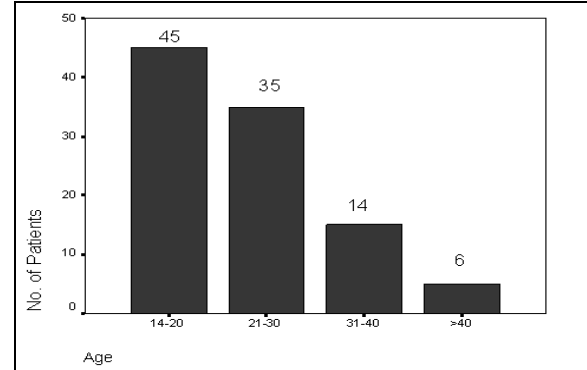


Figure-1: Distribution of age (n=100)

Table-1: Complications after partial nail avulsion with and without phenol application (n=100)

Complications		Partial Nail Avulsion				<i>p</i> -value
		With Phenol		Alone		
Days		3 rd	7 th	3 rd	7 th	
Pain (VAS)	No	2%	40%	0%	35%	0.018
	Mild	31%	6%	18%	10%	
	Moderate	12%	3%	22%	3%	
	Severe	5%	1%	10%	2%	
Infection			4%	3%	9%	0.029
Follow up time		1 month	6 month	1 month	6 month	
Spike Formation		Nil	Nil	2%	3%	0.022
Recurrence		Nil	1%	3%	4%	0.027
Mortality		None				

DISCUSSION

Ingrown toenails are common world wide and diverse treatment options exist.⁷An ideal surgical technique is not currently available, but theoretically, such an approach would be technically simple cost effective and yield good cosmetic results with low recurrence rates. Furthermore, the procedure would be done on an outpatient basis with a quick return to normal activities and low complication rates.⁸ A wide range of surgical methods are available for the treatment of Ingrown toe nail. These options include simple incision and drainage of the abscess, the partial nail excision (wedge resection), nail avulsion and radical excision (Zaddik’s procedure) of the nail.⁹⁻¹³ But the surgical treatment only is associated with high recurrence rate.⁹ Initially the preferred treatment was simple nail avulsion (extraction) or partial nail avulsion (wedge resection) but these procedures have fallen out of favour due to the high recurrence rates ranging between 64% and 83%.¹⁴⁻¹⁶ The technique of partial nail avulsion often fails to remove the spicule which needed incision of eponychium. The

recurrence rate of wedge resection with incision of the eponychium ranges from 10% to 30%.^{11,12,17-19} A recent trial noted an improved but still unsatisfactory 1-year recurrence rate of 6.9% for partial nail avulsion and surgical matricectomy.²⁰ The use of phenol was described by Ross in 1969 and is also called angular phenolization.¹⁰ Studies have shown that application of phenol after partial nail avulsion reduces the recurrence rate to 0–4.4%.^{21,22} Application of the phenol after partial nail avulsion chemically destroys the matrix and prevents the recurrence of the in growing toe nail. Some people argue that use of phenol may cause an increased risk of post operative infection.^{13,23} However further studies showed that the use of phenol does not lead to more chances of infection than matrix excision.²⁰

Many researchers have shown that patient satisfaction in terms of less pain and earlier pain relief was greatest in the nail matrix phenolization group.^{22,24} Studies also shown that application of phenol after partial nail avulsion resulted in decrease in spike formation and recurrence of ingrown toe nail.¹⁰⁻¹² These results indicate that nail matrix phenolization is an efficient therapy for ingrown toenails and may be preferable to partial nail avulsion only.

In our study we compared the partial nail avulsion for the ingrown toe nail with application of phenol after the partial nail avulsion. Postoperatively patients with application of the phenol had less pain as compared to partial nail avulsion alone especially at the 3rd of the surgery. But the comparison of the pain at the 7th day showed that both groups of the patients had same intensity of pain. The results in our study are comparable to many international studies. Carina compared in the pain felt by the groups and reported that both group patients felt pain of same intensity.²⁴

Postoperative infection is the main concern after every surgery and it is same for the in grown toe nail surgery as well. In this study patients who had partial avulsion with application of phenol had less infection (4%) as compared to partial nail avulsion alone group (12%) ($p=0.029$). Thommasen showed that application of the phenol result in decrease infection as compared to partial nail avulsion alone group.²⁵ Spike formation and recurrence are the troublesome and very disabling complications of the ingrown toe nail surgery. There was no spike formation in the phenol group while there were 5 recurrences in partial nail avulsion alone group. There was only one recurrence in the phenol group while 7 patients had recurrent ingrown toe nail in the partial nail avulsion alone group. The p -value for spike formation was 0.022 and for the recurrent ingrown toe nail was 0.027. Vaccari reported up to

0% spike formation and low recurrence after the application of the phenol as compared to partial nail avulsion only group.²²

The results of the our study are comparable to many international studies except for the early postoperative pain assessed at 3rd after surgery which is less in phenol application group as compared to partial nail avulsion group only in our study.

CONCLUSIONS

Application of phenol after partial nail avulsion resulted in less post-operative pain in early postoperative period, less wound infection, no spike formation and decrease recurrence as compared to the nail avulsion without application of phenol. We recommend use of phenol after partial nail avulsion for better patient outcome.

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