

Original Research

Sodium hydroxide versus phenol for chemical matricectomy in patients with ingrown toenails

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ABSTRACT:

Background: An ingrown toenail occurs when the edge or corner of a toenail grows into the surrounding skin instead of over it. This common ailment can manifest through symptoms such as pain, swelling, redness, and sometimes infection. The present study was conducted to assess the efficacy of phenol and sodium hydroxide for chemical matricectomy in the management of ingrown toenails. **Materials & Methods:** 80 cases of matricectomy of both genders were divided into 2 groups of 40 each. Group I patients received 88% phenol and group II received 10% NaOH chemical matricectomy. The following were recorded: the duration of complaints, the severity of ingrown toenails, the duration of postoperative pain, the duration of postoperative discharge, and the time required for tissue normalization. **Results:** Out of 80 patients, 46 were males and 34 were females. The mean duration of postoperative pain was 6.1 days and 12.7 days, duration of complaints was 13.4 months and 9.1 months, time taken for tissue normalization was 9.3 days and 16.2 days and the duration of postoperative discharge was 14.5 days and 19.5 days in group I and group II respectively. The difference was significant ($P < 0.05$). The severity of ingrown toenail in group I and group II was stage 1 in 14 and 17, stage 2 in 7 and 9 and stage 3 in 18 and 15 patients respectively. The difference was significant ($P < 0.05$). **Conclusion:** The treatment of ingrown toenails with 10% sodium hydroxide is equally effective as an 88% phenol chemical matricectomy. Its unfavorable impact profile is slightly better.

Keywords: toenail, matricectomy, sodium hydroxide

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INTRODUCTION

An ingrown toenail occurs when the edge or corner of a toenail grows into the surrounding skin instead of over it.¹ This common ailment can manifest through symptoms such as pain, swelling, redness, and sometimes infection. Ingrown toenails can occur on any toe, but they most commonly affect the big toe. Rounding the edges or cutting them too short can promote the development of ingrown toenails.² Very tight footwear can compress the toes and drive the nails into the skin. Trauma to the toe, like stubbing it, can sometimes cause an ingrown toenail. Some individuals may have a genetic predisposition to develop ingrown toenails.³

Lateral matricectomy, or the removal of the matrix's lateral horns, is an essential component of treating

ingrown toenails. Either surgery or, more commonly, chemical matricectomy—the destruction of the lateral matrix—can be used to achieve this.⁴ For many decades, phenol (solution with 88% concentration) has been one of the most successful and commonly utilized agents; still, it can lead to extended postoperative drainage and a postponed recovery, even when applied carefully.⁵ It is standard procedure to examine alternative medications to reduce postoperative morbidity. Sodium hydroxide (NaOH; 10% solution) is a viable option demonstrated to be safe, effective, and capable of minimizing postoperative drainage; nevertheless, only a limited number of studies on long-term efficacy exist.^{6,7} The present study was conducted to assess the efficacy of

phenol and sodium hydroxide for chemical matricectomy in the management of ingrown toenails.

MATERIALS & METHODS

The present study consisted of 80 cases of matricectomy of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 40 each. Group

I patients received 88% phenol and group II received 10% NaOH chemical matricectomy. The following were recorded: the duration of complaints, the severity of ingrown toenails, the duration of postoperative pain, the duration of postoperative discharge, and the time required for tissue normalization. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 80		
Gender	Male	Female
Number	46	34

Table I shows that out of 80 patients, 46 were males and 34 were females.

Table II Assessment of parameters

Parameters	Group I	Group II	P value
Duration of postoperative pain (days)	6.1	12.7	0.01
Duration of complaints (months)	13.4	9.1	0.02
Time taken for tissue normalization (days)	9.3	16.2	0.01
Duration of postoperative discharge (days)	14.5	19.5	0.05

Table II, graph I shows that the mean the duration of postoperative pain was 6.1 days and 12.7 days, duration of complaints was 13.4 months and 9.1 months, time taken for tissue normalization was 9.3 days and 16.2 days and the duration of postoperative discharge was 14.5 days and 19.5 days in group I and group II respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters

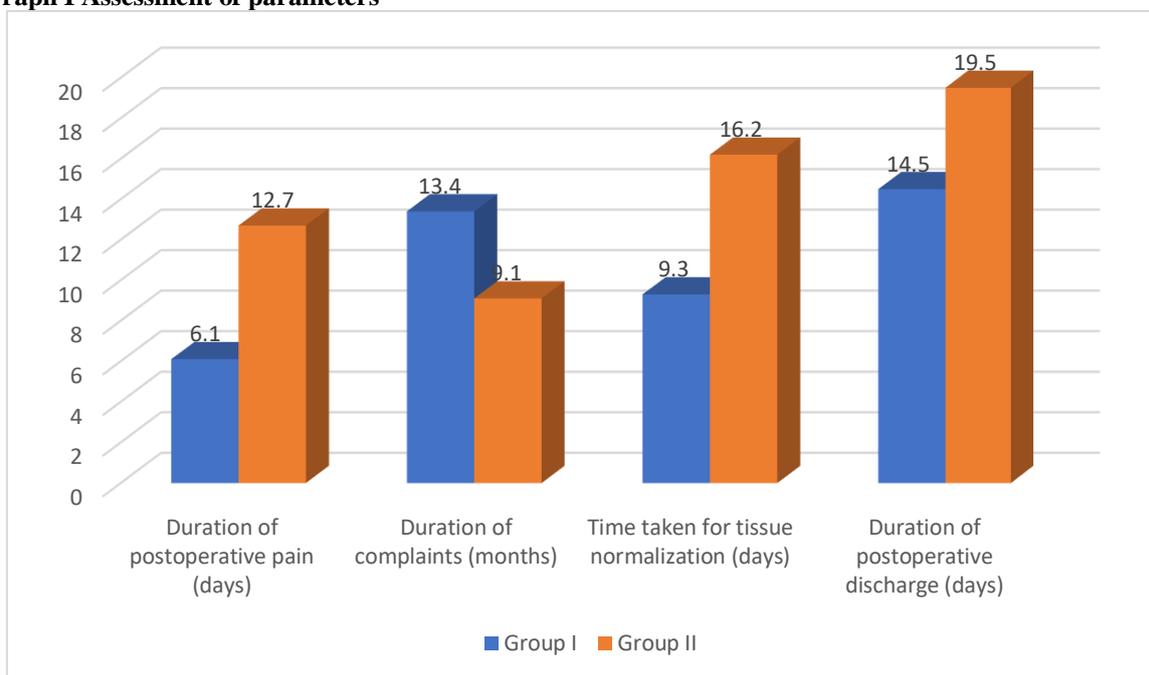


Table III Severity of ingrown toenail

Stage	Group I	Group II	P value
Stage 1	14	17	0.29
Stage 2	9	10	
Stage 3	17	13	

Table III shows that the severity of ingrown toenail in group I and group II was stage 1 in 14 and 17, stage 2 in 9 and 10 and stage 3 in 17 and 13 patients respectively. The difference was significant (P< 0.05).

DISCUSSION

Ingrown toenails are among the most frequent painful nail conditions that dermatologists encounter.⁸ This occurs when the lateral edge of the nail plate becomes embedded in the nail fold (acting as a foreign body), leading to a series of inflammation, infection, and repair processes. The condition primarily affects young adults and usually involves the great toes. In recent years, partial nail plate avulsion combined with chemical cauterization of the matrix edge has become the preferred method among many doctors treating ingrown nails.⁹ This procedure traditionally involved the use of two chemical agents: sodium hydroxide and phenol. The initial agent applied is phenol, which is reported to yield effective outcomes with success rates exceeding 95%.¹⁰ The present study was conducted to assess the efficacy of phenol and sodium hydroxide for chemical matricectomy in the management of ingrown toenails.

We found that out of 80 patients, 46 were males and 34 were females. In the research conducted by Grover et al¹¹, individuals suffering from ingrown toenails were randomly assigned to two treatment groups based on their enrollment order. They received chemical matricectomy using either 88% phenol (Group 1, n = 26) or 10% NaOH (Group 0, n = 23). The median duration of postoperative pain was 7.92 days for Group 0 and 16.25 days for Group 1 ($P < 0.202$), suggesting that both groups effectively responded to therapy. For Group 0, the median postoperative discharge duration was 15.42 days, while for Group 1 it was 18.13 days ($P < 0.203$). The tissue condition normalized after 7.50 days for Group 0 and 15.63 days for Group 1 ($P < 0.007$).

We found that the mean the duration of postoperative pain was 6.1 days and 12.7 days, duration of complaints was 13.4 months and 9.1 months, time taken for tissue normalization was 9.3 days and 16.2 days and the duration of postoperative discharge was 14.5 days and 19.5 days in group I and group II respectively. Ozdemir et al.¹² divided 60 patients into two groups and conducted 156 partial chemical matricectomy surgeries with 10% sodium hydroxide. The first group (80 nail sides) received a 2-minute sodium hydroxide application, while the second group (76 nail sides) underwent curettage of the lateral matrix area along with a 1-minute sodium hydroxide application. Postoperative discomfort, drainage, and tissue damage were evaluated two days after the procedure and at three additional visits that were one week apart. The success rate of partial matricectomy with 10% sodium hydroxide was 100% in both groups ($P > 0.05$). Most patients experienced either no postoperative discomfort or only minor tissue damage, with no statistically significant difference between the two groups. On the 2nd day, more patients in the first group experienced mild drainage than the patients in the second group ($P = 0.001$), but in the following control visits, this difference disappeared.

We found that the severity of ingrown toenail in group I and group II was stage 1 in 14 and 17, stage 2 in 7 and 9 and stage 3 in 18 and 15 patients respectively. The best timing for sodium hydroxide application was evaluated by Kocyigit et al.¹³, and it yielded high success rates and minimal postoperative morbidity. Three groups of 66 patients with 225 ingrown nail edges underwent sodium hydroxide treatments that lasted for 30 seconds, 1 minute, and 2 minutes. Postoperatively, each patient underwent an examination for tissue injury, discomfort, and drainage. The median duration of the long-term follow-up was 14 months. In the first group, the therapy had a success rate of 70.9%, while in the second and third groups, the rates were 92.7% and 94.4%, respectively. Almost half of the patients in all groups reported experiencing little pain within 48 hours after the procedure; only 20% of the patients in the third group, however, reported experiencing little pain for at least a week. All groups experienced minimal to no tissue injury or drainage, which resolved after three weeks for the first two groups but took six weeks for the third group.

The shortcoming of the study is the small sample size.

CONCLUSION

Authors found that the treatment of ingrown toenails with 10% sodium hydroxide is equally effective as an 88% phenol chemical matricectomy. Its unfavorable impact profile is slightly better.

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