JOURNAL OF
CONTEMPORARY MEDICINE

DOI:10.16899/jcm.1175187
J Contemp Med 2022;12(6):930-936

Original Article / Orijinal Araştırma

Comparison of Winograde and Vandenbos Surgical Techniques According to Heifetz Stage in the Treatment of Ingrown Toenails

Batık Tırnak Tedavisinde Winograde ve Vandenbos Cerrahi Tekniklerinin Heifetz Evresine Göre Karşılaştırılması

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Abstract

Aim: In ingrown toenail, classifications and the treatment approaches according to staging has been clearly reported in the literature. However, there are not enough data about the selection of the appropriate surgical technique according to the stage. In this study, we compared two different surgical techniques in patients with Heifetz stage 2 and 3 in means of surgical results, recovery time, patient comfort and cosmetics.

Material and Method: Between January 2019 and January 21, patients who applied with the complaint of ingrown toenails who were treated with two mentioned surgical techniques in two centers with at least 1 year follow-up were included. The patients were evaluated preoperatively in means of the Heifetz classification. In group 1 (n:54) matrix excising Winograd and in group 2 (n:51) matrix preserving Vandenbos techniques were used. Postoperative recovery time, complication rates, functional and cosmetic patient satisfaction were evaluated in tall cases.

Results: 105 cases of ingrown toenails treated surgically were included in the study. 62 (59%) cases were Heifetz stage 2, 43 (41%) cases were Heifetz stage 3. No statistically significant difference was found between Heifetz stage 2 and stage 3, regardless of surgical technique, in complication, recurrence, patient functional/cosmetic satisfaction rates, and recovery time. In overall analysis regardless of Heifetz staging, recovery time was shorter with Winograd method (p:0.0001), complication and recurrence rates were lower with Vandenbos method (p:0.0001), and VAS cosmetic satisfaction was higher in Vandenbos (p:0.002).

Conclusion: Winograd and Vandenbos in Heifitz stages 2 and 3 have low complication rates and high patient satisfaction. Earlier healing could be achieved with the Winograd technique, while low complication/recurrence rates and high cosmetic satisfaction could be achieved with the Vandenbos technique. Early recovery/high cosmetic expectation should be considered instead of Heifetz staging in determining the surgical technique.

Keywords: Ingrown toenail, Heifetz, Vandenbos, Winograd

Öz

Amaç: Tırnak batmasında evrelemeye göre sınıflandırmalar ve tedavi yaklaşımları literatürde net olarak bildirilmiştir. Ancak evreye göre uygun cerrahi tekniğin seçimi konusunda yeterli veri bulunmamaktadır. Bu çalışmada Heifetz evre 2 ve 3 olan hastalarda iki farklı cerrahi tekniği cerrahi sonuçlar, iyileşme süresi, hasta konforu ve kozmetik açısından karşılaştırdık.

Gereç ve Yöntem: Ocak 2019-21 Ocak tarihleri arasında tırnak batması şikayeti ile başvuran ve iki merkezde en az 1 yıl takipli olarak bahsedilen iki cerrahi teknikle tedavi edilen hastalar dahil edildi. Hastalar ameliyat öncesi Heifetz sınıflamasına göre değerlendirildi. Grup 1'de (n:54) Winograd matriks eksizyonu, grup 2'de (n:51) matriks koruyucu Vandenbos teknikleri kullanıldı. Bu olgularda ameliyat sonrası iyileşme süresi, komplikasyon oranları, fonksiyonel ve kozmetik hasta memnuniyeti değerlendirildi.

Bulgular: Çalışmaya cerrahi olarak tedavi edilen 105 tırnak batması olgusu dahil edildi. 62 (%59) olgu Heifetz evre 2, 43 (%41) olgu Heifetz evre 3 idi. Heifetz evre 2 ile evre 3 arasında cerrahi teknik, komplikasyon, nüks, hasta fonksiyonel/kozmetik açısından istatistiksel olarak anlamlı fark bulunmadı. Memnuniyet oranları ve iyileşme süresi genel analizde Heifetz evrelemesinden bağımsız olarak Winograd yöntemi ile iyileşme süresi daha kısaydı (p:0.0001), Vandenbos yöntemi ile komplikasyon ve nüks oranları daha düşüktü (p:0.0001), Vandenbos'ta VAS kozmetik memnuniyeti daha yüksekti (p:0.002).

Sonuç: Heifitz evre 2 ve 3'teki Winograd ve Vandenbos düşük komplikasyon oranlarına ve yüksek hasta memnuniyetine sahiptir. Winograd tekniği ile daha erken iyileşme sağlanırken, Vandenbos tekniği ile düşük komplikasyon/nüks oranları ve yüksek kozmetik memnuniyet sağlanabilmektedir. Cerrahi tekniğin belirlenmesinde Heifetz evrelemesi yerine erken iyileşme/yüksek kozmetik beklenti göz önünde bulundurulmalıdır.

Anahtar Kelimeler: Tırnak batması, Heifetz, Vandenbos, Winograd

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Received *(Geliş Tarihi)*: 14.09.2022 **Accepted *(Kabul Tarihi)*:** 25.09.2022

INTRODUCTION

Ingrown toenail is a painful and unpleasant condition that often occurs in adolescents and young adults. The Heifetz classification is used for staging ingrown toenail.[1,2] Heifetz stage 1 is the inflammation stage, there is mild swelling and redness in the nail bed. Conservative treatment is usually enough in this stage but in Heifetz stage 2, there is acute infection and suppuration. The nail bed protrudes above the nail plate. In Heifetz stage 3, there is chronic nail bed hypertrophy and a granulation tissue forms on the nail plate. If there is no improvement with conservative treatment in Heifetz stages 2 and 3, surgical treatment is required. Nail bed surgery can be broadly divided into two topics. In the first, the nail matrix is excised, and in the second, the nail matrix is preserved. The Winograd technique is the most commonly used method of nail matrix excision. In this technique, the matrix is partially excised.[3] One of the most commonly used surgical methods that preserve the nail bed is the Vandenbos technique. In this technique, a wide elliptical excision of the paronychium is performed.[4] In this study, we compared the results of two different surgical techniques used in Heifetz stage 2 and stage 3 patients. There are publications in the literature comparing Vandenbos and Winograd techniques. However, there was no comparative publication based on staging according to our knowledge. In this study, we compared the results of Vandenbos and Winograde techniques in Heifetz stage 2 and stage 3 patients.

MATERIAL AND METHOD

After the approval of ethics committee (approval number: 2021/200, approval date: 29.09.2021), Heifetz classification was used for preoperative staging. Patients with Heifetz stages 2 and 3 who did not respond to conservative treatment were included. Traumatic, relapsed, deformed, diabetic nails were excluded. All patients had a follow-up period for at least 12 months. In our study105 cases with Heifetz stage 2 and 3 between January 2019 and January 21 were evaluated. Patients were surgically treated with either Winograd or Vandenbos techniques randomly. The results were evaluated in retrospective manner. All patients were informed before surgery and an ethical committee approval was obtained. The recurrence rate, complication rate, and recovery time of all patients were recorded. Recovery status/duration was based on duration after surgery that patient was able to wear shoe. Recovery duration, complications, recurrences, functional and cosmetic patient satisfaction rates of Vandenbos and Winograd methods were statistically analyzed. We decided on the recurrence situation in the following cases; recurrent ingrown toenails, spicule formation, and recurrence of initial symptoms (pain, erythema). A visual analog score (VAS) was used postoperatively to evaluate the functional and cosmetic satisfaction of the patients. The relationship between the persistence of pain, difficulty in wearing shoes and dissatisfaction were analyzed. All surgeries were performed by two experienced orthopedic surgeons.

Surgical Technique

Chapeski technique was used for Vandenbos procedure. A first generation cephalosporin was administered to all patients 30 minutes before the operation for infection prophylaxis. A digital block was performed at the base of the toe with 2 % prilocaine, and a tourniquet (eg, the finger of a surgical glove was used as a tourniquet) was wrapped tightly around the toe. Surgical area was cleaned with an iodine wash. A 5 mm incision was made proximally from the base of the nail, about 3 mm from the edge (leaving the nail bed intact). The incision has been extended toward the side of the toe in an elliptical sweep and finished under the tip of the nail, still keept at least 3 mm from the edge. All skin tissue at the edge of the nail was removed. An adequate excision was performed in each patient that left a soft tissue deficiency of about 1.5 x 3 cm. A portion of the lateral aspect of the distal phalanx was exposed if necessary. After the tourniquet removal external pressure was applied for at least 3 minutes and then the whole area was cauterized extensively. A tight dressing was applied with Coban bandage for 15 minutes to reduce postoperative bleeding. The foot was held high in the observation room, and then the bandage was loosened and a soft dressing was applied. Shoes were not allowed until the wound was completely healed and antibiotic prophylaxis was applied for 5 days after the procedure. Patients were advised for 2-week follow-ups to ensure adequate healing and proper care of the wound. After 4 to 6 weeks, skin covering the nail was considered healing (**Figure 1**).

Figure 1. 15 years old man, bilateral Heifitz stage 3 ingrown toenails treated with Vandenbos method. Patient has a staisfactory result.

Winograde procedure; all cases were performed under digital block anesthesia (2% prilocaine solution) with finger tourniquet. Wedge excision was performed from the lateral or medial corner, covering one-fourth of the entire nail. This incision was advanced 5 mm into the eponychium. The quarter part of the nail and the germinal matrix were excised. Curettage was performed on the excised part of the nail

bed so that no nail matrix remained. After the hypertrophic granulation tissue was excised with a scalpel, the lateral nail fold was sutured to the nail plate with 2-0 prolene (Eticon, Division of Johnson & Johnson, Sommerville, NJ). Soft dressing and oral antibiotic prophylaxis for 5 days were applied in all cases. Dressing was repeated every 3 days and they were terminated after the sutures were removed on the 10th day. It was recommended not to wear shoes until wound healing was complete. Patients were followed weekly in the first month after the sutures were removed (**Figure 2**).

Table 1

		Min-Max	Median	Med.±sd/n-%	
Age		8.0-57.0	16.0	18.2±7.2	
18 Years old	< 18 Years old			62	59.0%
	≥ 18 Years old			43	41.0%
Gender	Female			49	46.7%
	Male			56	53.3%
Side	Right			48	45.7%
	Left			57	54.3%
Heifetz Stage	II			62	59.0%
	III			43	41.0%
Complication	Yes			93	88.6%
	No			12	11.4%
Complication Type	Recurrence			6	50.0%
	Local Infection			3	25.0%
	Spicule Formation			2	16.7%
	Bleeding			1	8.3%
	Residual Pain			1	8.3%
	Numbness			1	8,3%
Recurrence	Yes			99	94.3%
	No			6	5.7%
Revision Surgery Technique	Winograd			4	66.7%
	Vanderbos			1	16.7%
	Winograd Re-revision			1	16.7%
Healing Time		7.0-32.0	15.0	15.6±5.5	
VAS Functional Patient Satisfaction		7.0-10.0	10.0	9.8±0.7	
VAS Cosmetic Patient Satisfaction		5.0-10.0	10.0	9.0±1.4	

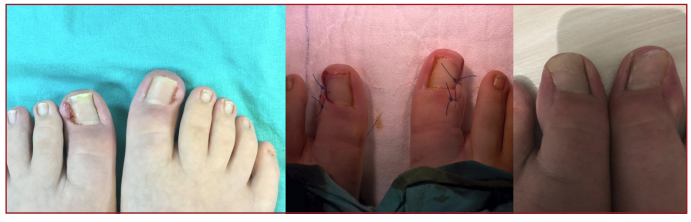

Figure 2. 14 years old man, left Heifetz stage 3 and left Heifetz stage 2 ingrown toenail treated with Winograd method. Patient has a satisfactory result.

Statistical Method

In the descriptive statistics of the data; mean, standard deviation, median minimum, maximum, frequency and ratio values were used. The distribution of variables was measured with the Kolmogorov-Smirnov test. Student-t test was used in the analysis of quantitative independent data. Chi-square test was used in the analysis of independent qualitative data, and fischer test was used when the chi-square test conditions were not met. SPSS 28.0 program was used in the analysis.

RESULTS

The median age of the patients and follow-up duration were 18 (8-57) years and 15.3 (12-25) months respectively. 56 (53.3%) of the patients were male. 62 (59%) of 105 cases were staged as Heifetz stage 2 while 43 (41%) were staged as stage 3. Winograd/Vandenbos procedure rates in these stages were as follows; 39/23 in stage 2 and 15/28 in stage 3. There was no difference between the complication rates and patient satisfaction of Heiftez stage 2 and stage 3 patients treated either with Winograd and Vandenbos. The VAS functional and cosmetic results for Winograd/Vandenbos in stage 2 patients were as follows; 9.7/9.7, 8.5/9.6 respectively. The VAS functional and cosmetic results for Winograd/Vandenbos in stage 3 patients were as follows; 9.7/10, 8.5/9.6 respectively (**Table 2, 3**). In Heifetz stages 2 and 3, no statistically significant difference was found between both methods in means of VAS functional scores. We observed a higher satisfaction rate in cosmetic score of patients operated with Vandenbos in both stages (p:0.002, 0.004 respectively). Most common cosmetic complaint in Winograd group was proximal incision scars (**Figure 3**). Recovery time was found to be 10.8±2.8 days in Heifetz stage 2 Winograd patients and 20.0±2.2 days in Vandenbos patients (p:0.0001). Recovery time was 12.0±2.8 days in patients treated with Heifitz grade 3 Winograd, and 20.6±3.8 days in patients treated with Vandenbos (p:0.0001). Regardless of Heifitz staging, the recovery time was 20.3±3.1 days with the Vandenbos method and 11.1±2.8 days with the Winograd method (p:0.0001). Recovery time was significantly longer with the Vandenbos method.

Figure 3. 18 years old man, a bad cosmetic result after Winograd method.

Table 2

Heifetz Stage 2		Winograd			Vandenbos			p
		Med.±sd/n-%		Median	Med.±sd/n-%		Median	
Age		17.7±5.6		16.0	17.3±7.5		15.0	0.581[m]
Age	< 18	24	61.5%		15	65.2%		0.722[X²]
	≥ 18	15	38.5%		8	34.8%		
Gender	Female	18	46.2%		11	47.8%		0.899[X²]
	Male	21	53.8%		12	52.2%		
Side	Right	15	38.5%		10	43.5%		0.697[X²]
	Left	24	61.5%		13	56.5%		
Complication	Yes	32	82.1%		21	91.3%		0.318[X²]
	No	7	17.9%		2	8.7%		
Recurrence	Yes	34	87.2%		23	100%		0.073[X²]
	No	5	12.8%		0	0.0%		
Healing Time		10.8±2.8		10.0	20.0±2.2		20.0	0.000[m]
Patient Satisfaction								
VAS Functional		9.7±0.8		10.0	9.7±0.9		10.0	0.700[m]
VAS Cosmetic		8.5±1.6		9.0	9.6±0.9		10.0	0.002[m]

m Mann-whitney u test / X^2 chi-square test (Fischer test)

Table 3

Heifetz Stage 3		Winograd			Vandenbos			p
		Med.±sd/n-%		Median	Med.±sd/n-%		Median	
Age		17.5±4.0		16.0	20.1±9.8		19.0	0.979[m]
Age	< 18	10	66.7%		13	46.4%		0.205[X²]
	≥ 18	5	33.3%		15	53.6%		
Gender	Female	8	53.3%		12	42.9%		0.512[X²]
	Male	7	46.7%		16	57.1%		
Side	Right	9	60.0%		14	50.0%		0.531[X²]
	Left	6	40.0%		14	50.0%		
Complication	Yes	13	86.7%		27	96.4%		0.275[X²]
	No	2	13.3%		1	3.6%		
Recurrence	Yes	14	93.3%		28	100%		0.349[X²]
	No	1	6.7%		0	0.0%		
Healing Time		12.0±2.8		12.0	20.6±3.8		20.0	0.000[m]
Patient Satisfaction								
VAS Functional		9.7±0.9		10.0	10.0±0.2		10.0	0.215[m]
VAS Cosmetic		8.5±1.4		8.0	9.6±1.1		10.0	0.004[m]

m Mann-whitney u test / X^2 chi-square test (Fischer test)

Complications developed in 12 (11.4%) of 105 cases in the study. Types of complications; recurrence in 6 patients, local infection in 3 patients, bleeding in 1 patient, residual pain in 1 patient, and numbness in 1 patient. There was no statistically significant difference in the complication rate in Heifetz stages 2 and 3. However, when surgical methods compared overall complication and recurrence rates were found to be significantly higher in Winograd method (p:0.0001). Complications were observed in Winograd and Vandenbos methods were as follows; n:9 (16.7%)/n:3 (5%) respectivelyof 54 cases performed with the Winograd method, and recurrence was found in 6 (11.1%). Spicule formation was most common recurrence type. Recurrence and revision surgery needs for Winograd and Vandenbos methods were as follows; n:5 (9%)/n:1 (2%) respectively (p:0.0001). In cases with recurrence, VAS patient satisfaction was 8 and VAS cosmetic results were 7. The complication seen in the other 3 patients was early superficial local infection. 1 case was treated with debridement and antibiotherapy. In the other 2 cases, only oral antibiotics were prescribed. Complications developed only in 3 cases with Vandenbos technique. Residual pain developed in 1 patient, numbness occurred at the edge of the finger in 1 patient, and late bleeding developed in 1 patient. Late bleeding was treated with follow-up dressing and VAS functional satisfaction was 10. Functional VAS was found to be 8 and VAS satisfaction was found to be 7 in patients who developed residual pain and finger margin numbness. No additional surgical intervention was required for any of the complications that developed after Vandenbos method.

DISCUSSION

Ingrown toenails impair the quality of life of the person by causing bleeding, discharge and pain. The Heifetz classification is often used to decide on treatment. Heifetz stage 1 is first treated conservatively. However, after this early stage, Heifitz stages 2 and 3 often require surgical treatment. In surgical treatment; early recovery, returning to work/school in a short time, non-recurrence and good cosmetic results are targeted. To our knowledge, there is no publication in the literature comparing which method is more successful in Heifetz stage 2 and stage 3. In Martinez-Nova's study, where they added one more stage to the classification and gave a treatment algorithm, Winograd was recommended for everyone. However, no data or details about its definitive success have been reported.[6]. In this study, we compared the surgical treatment results of Heifetz stage 2 and 3 ingrown toenails.

Kose et al.[7] found a 13.2% recurrence rate in a study of 68 patients with Winograd. Pettine et al.[8] found this rate to be 6% in a study conducted on 95 patients. Acar et al.[9] reported 6% recurrence in another study involving 102 patients. According to Karacan et al. who conducted a study using Vandenbos and Winograde techniques [10] 14% recurrence was observed in 70 patients who underwent Winograd, while no recurrence was observed in patients who were operated with Vandenbos. In another study of 110 pediatric patients, 11% recurrence was seen with the Winograd technique and 2.2% with the Vandenbos technique.[11] Perry et al.[12] found no statistically significant difference in recurrence rates between Vandenbos and Winograd. In a meta-analysis of 9 different studies with Vandenbos, the recurrence rate was found to be between 0% and 20%. However, 7 studies here reported a 0% recurrence rate.[13] In our study, recurrence rates were found consistent with the literature. Recurrence was observed in 11.1% of the 54 cases in which we applied Winograd, while there was no recurrence in any of the 51 cases in which we applied Vandenbos. According to steges; Winograd in Heifetz stage 2 cases, had 12.8% rate and in cases with Heifetz stage 3, 6.7% recurrence rate was observed. In other words, the recurrence rate was significantly higher with the Winograd technique in both stages. Our study, like other studies, revealed that the best way to avoid recurrence is the Vandenbos technique. The main reason for ingrown nails is the protrusion of soft tissue on the nail. Therefore, the tissue around the nail should be pulled down. In the Winograd technique, the nail matrix is partially removed and the lateral fold is sutured to the nail. In the Vandenbos technique, while the nail remains in place, the soft tissue around the nail is excised, so it does not hypertrophy again and recurrence does not occur. Spiculum formation is a complication specific to the Winograd method that can cause recurrence. We also observed spicule formation in 2 (3.7%) of 54 cases treated with Winograd. We accepted these cases as recurrences and performed Winograd as revision surgery. In this case, the nail emerges symmetrically from the proximal corner and disturbs the patient again. The only treatment is surgical re-extraction of the matrix with a spicule. Since the nail matrix is not touched in Vandenbos, complications of spicule formation are not seen.

In some of our patients, VAS cosmetic satisfaction was found to be low due to the formation of proximal incision scars, which is one of the typical complications. With the Vandenbos method, Chapeski and Kovac observed loss of thumb sensation in 1.6% of patients.[14] In our study, similar to the literature, we observed loss of sensation in the finger in 1 patient (1.9%) in whom we applied Vandenbos. Peyvandi et al.[15] reported 7.5% local infection in the Winograd study of 40 patients and Acar et al.[9] reported that no postoperative infection was observed. In our study, 5.5% local recurrence was observed in Winograd applied cases, while local infection was not observed in Vandenbos applied cases. Local infection was observed in 2 (5.1%) of Heifetz stage 2 Winograd cases and in 1 (6.6%) of Heifetz stage 3 Winograd cases. There was no significant difference in terms of local infection in Heifitz stages 2 and 3. Complete response was obtained in all these complications with dressing and oral antibiotic therapy.

In the Vandenbos technique, the soft tissue around the nail is removed aggressively, although it can be thought that this creates a susceptibility to infection, this complication is not common in literature. In the meta-analysis in which 9 studies related to the Vandenbos technique were compiled in the literature, the infection rate was stated as 0% among 682 cases.[13] We evaluated all complications, including recurrence, in our study. Therefore, we had the opportunity to compare minor and major complications together. In Heifetz stage 2, there were 7 (17.9%) complications in Winograd and 2 (8.7%) complications in Vandenbos. In Heifetz stage 3, 2 (13.3%) complications were detected with Winograd and 1 (3.6%) with Vandenbos. There was no statistically significant difference between Winograd and Vandenbos techniques and Heifetz stages 2 and 3. However, when all cases were evaluated without group discrimination, we found that complication rates were higher in Winograd. In our study, one patient who underwent Vandenbos had loss of sensation in the finger, one patient had bleeding and one patient had residual pain. No recurrence was detected in any patient. In addition, recurrence was detected in 6 patients and local infection was detected in 3 patients who were operated with Winograd. As a result, the complication and recurrence rate with the Winograd method was statistically higher than the Vandenbos method regardless of the stages.

The types and rates of these complications were similar to the literature.[7-15] Acar et al.[9] reported in their study with Winograd, the recovery duration was 10 days, Antrum at al.[16] reported 20 days in their study with Vandenbos. According to Karacan et al.[10] in the study in which they compared Winograd and Vandenbos, recovery durations were reported as 11.8 days in both groups. Perry et al.[12] compared Winograd and Vandenbosand reported recovery durations of 2.4 weeks and 5 weeks, respectively. In our study, recovery duration

with Winograd and Vandenbos at Heifitz 2nd stage were 10.8 days and 20 days, respectively (p:0.0001). In Heifitz stage 3, recovery durations with Winograd and Vandenbos were 12 days and 20.6 days, respectively (p:0.0001). In our study, no significant difference was found between recovery durations in the comparison of Heifitz stage 2 and 3 patients with each other. In our study, recovery duration independent of Heifitz staging was 11.1 days with Winograd and 20.3 days with Vandenbos. Similar results have been reported in the literature with Winograde and Vandenbos. The mean recovery duration with Vandenbos is significantly longer than with the Winograd method, regardless of Heifitz staging.

While Chapeski [5] reported 94% patient satisfaction with the Vandenbos technique, Haricharan et al.[17] reported 99% patient satisfaction with Vandenbos. Karacan et al.[10] evaluated both functional and cosmetic satisfaction, similar to our study, by comparing Vandenbos and Winograd. In this study, functional and cosmetic patient satisfaction with Winograd was 80% and 85%, respectively, and with Vandenbos, functional and cosmetic patient satisfaction was 98% and 98%, respectively. Acar et al.[9] reported 93.1% patient satisfaction (very satisfied-satisfied) with the Winograd technique in 102 patients. Another recent study with Winograd reported 4% patient dissatisfaction due to residual pain associated with the proximal incision scar. [18] In our study, high patient satisfaction rates were found with Winograd and Vandenbos methods, regardless of Heifetz staging. However, in our study, significantly lower cosmetic satisfaction was found with the Winograd method compared to the Vandenbos method. In a study in which cosmetic results were reported after the Winograd method, 8.8% patient dissatisfaction was reported.[7] In this study, it was reported that all patients with cosmetic dissatisfaction were women and the reason for their complaints was the proximal incision scar. It has also been reported that there is asymmetry between the nails due to the narrowing of the nail bed. It has been stated that this will be more evident in bilateral ingrown fingers or in recurrence surgery. Due to high cosmetic dissatisfaction, Winograd is not recommended in cases of relapse, ingrown toenails and female patients.[7] In our study, cosmetic satisfaction with Winograd was found to be low by 12.2%, especially in female patients. For this reason, we do not recommend the Winograd technique to patients who have high cosmetic expectations, such as women, who have bilateral involvement, and might require revision treatment due to recurrence. We recommend the Vandenbos technique to this patient group.

Limitations

The limitation of our study is that it is retrospective and only compares two techniques for Heifetz staging. However, the positive aspects of our study are the high number of cases, the follow-up period of 12 months or more, and the comparison of frequently preferred effective surgical techniques such as Winograd and Vandenbos. It is also the first study to evaluate the effectiveness of the treatment according to the Heiftez staging. We think that studies should be conducted with other surgical and conservative techniques according to Heifetz staging.

CONCLUSION

There was no significant relationship between Winograd and Vandenbos surgical techniques in terms of patient outcomes according to Heifetz staging. Regardless of Heifitz staging, surgical intervention provides high patient satisfaction with both Winograd and Vandenbros methods. With the Winograd method, the recovery time is shorter in both stages. Considering the cosmetic results and recurrence, the Vandenbos method gives better results than the Winograd method in both stages.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Sancaktepe Prof. Dr. İlhan Varank Training and Research Hospital Scientific Researches Ethics Committee (Date: 29/09/2021, Decision No: 2021/200).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The author has no conflicts of interest to declare.

Financial Disclosure: The author declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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