

Research Article**A COMPARATIVE STUDY OF KELLER'S ARTHROPLASTY VERSUS CONVENTIONAL DRESSING IN THE MANAGEMENT OF DIABETIC FOOT ULCERS****Vigneshwaran S¹, Sakthibalan M²Gopinath G³, Mohan Raju T^{4*}**

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Abstract

Background: Diabetic foot ulcers are associated with delayed healing and high recurrence rates, particularly when mechanical pressure contributes to ulcer persistence. Keller's arthroplasty may improve healing by reducing pressure over the hallux and forefoot.

Objective: To compare the effectiveness of Keller's arthroplasty with conventional dressing in achieving ulcer healing, reducing healing time, recurrence, and treatment-related complications in patients with diabetic foot ulcers.

Methods: This comparative study included 100 patients with diabetic foot ulcers, with 50 patients undergoing Keller's arthroplasty and 50 receiving conventional dressing. Baseline characteristics, ulcer healing, time to complete healing, recurrence, and treatment-

related complications were assessed during 12 weeks of follow-up.

Results: Baseline demographic and ulcer characteristics were comparable between the two groups. Complete ulcer healing at 12 weeks was significantly higher following Keller's arthroplasty than conventional dressing (88% vs. 36%; $p < 0.001$). Among healed ulcers, the mean healing time was significantly shorter in the Keller group (5.2 ± 2.1 weeks) than in the conventional dressing group (9.1 ± 2.4 weeks; $p < 0.001$). Ulcer recurrence was also significantly lower after Keller's arthroplasty (6% vs. 24%; $p = 0.021$). Treatment-related complications occurred in 12% of patients in the Keller group compared with 42% in the conventional dressing group ($p = 0.002$). Overall treatment outcome was significantly better with Keller's arthroplasty ($p < 0.001$).

Conclusion: Keller's arthroplasty demonstrated superior healing, faster ulcer resolution, lower recurrence, and fewer complications compared with conventional dressing. It may therefore be an effective surgical option for appropriately selected patients with diabetic foot ulcers.

Keywords: Keller's arthroplasty; Diabetic foot ulcer; Wagner grade III; wound healing

INTRODUCTION

Keller's arthroplasty a major surgery largely indicated for the management of advanced hallux rigidus or painful first metatarsophalangeal joint (MTPJ) deformities has been used to manage diabetic foot ulcers (DFUs). Diabetic foot ulcers rank among the most debilitating side effects of diabetes mellitus and are often followed by infection, amputation, and increased mortality. [1] Peripheral neuropathy, peripheral arterial disease, and biomechanical abnormalities are all factors in the multifactorial pathophysiology of DFUs. Of these, offloading and pressure redistribution are critical to managing and preventing ulcers. Conventional dressing techniques have traditionally been the mainstay of DFU management, with the inherent functions of wound protection, moisture balance, and infection control. But where structural foot deformities are the cause of persistent or recurring ulcers, then surgery like Keller's arthroplasty is likely to provide better results by dealing with the root mechanical stress.[2] The diabetic foot is particularly prone to ulceration due to the inter play of neuropathy, ischemia, and immune dysfunction. Peripheral neuropathy leads to loss of protective sensation, resulting in unrecognized repetitive trauma and subsequent tissue breakdown. Additionally, motor neuropathy contributes to intrinsic muscle imbalance and foot

deformities, such as hallux valgus and claw toes, which further increase localized pressure on weight-bearing areas. The resultant hyperkeratosis and ulcer formation, often observed on the plantar surface or over bony prominences, are exacerbated by poor vascularity and impaired wound healing in diabetic patients. Conventional dressings aim to manage these wounds through principles of moist wound healing, exudates management, and infection control. While modern dressing materials, including hydrocolloids, alginates, and foam dressings, offer advantages in promoting granulation tissue and epithelialization, they do not address the biomechanical factors that perpetuate ulcer formation.[3,4]

Keller's arthroplasty, originally designed to relieve pain and restore function in arthritic or deformed MTP joints, involves the resection of the proximal phalanx of the great toe. By Removing the diseased joint surface and allowing for a pseudoarthrosis formation, the procedure reduces pressure on the plantar aspect of the forefoot. This surgical offloading is particularly advantageous in diabetic patients with hallux rigidus or severe bunion deformities, where conventional dressings alone are insufficient to alleviate the mechanical stress contributing to ulceration. Furthermore, Keller's arthroplasty improves foot biomechanics by reducing metatarsal head pressure and redistributing load during ambulation. This biomechanical correction not only facilitates wound healing but also decreases the likelihood of ulcer recurrence, thereby reducing the long-term risk of infection and amputation.[5,6]

The selection between Keller's arthroplasty and conventional dressing in the management of diabetic foot ulcers requires careful consideration of several factors, including ulcer size, location, presence of infection, and

the degree of structural foot deformity. In patients with mild to moderate ulcers and intact foot architecture, conventional dressings remain a viable and effective option. These dressings provide a controlled wound environment that promotes re-epithelialization and granulation tissue formation. Besides, newer technology in wound care, like biologic dressings and negative pressure wound therapy (NPWT), provides superior outcomes for chronic or non-healing ulcers. However, by removing the root structural deformity, Keller's arthroplasty can provide a more definitive intervention in instances where gross biomechanical abnormality contributes to perpetuation of ulcer. [7, 8]

Besides wound healing, Keller's arthroplasty also possesses some benefits. The procedure improves the overall quality of life for diabetic patients by decreasing pain and improving foot function. Additionally, reduction in plantar pressure obviates the necessity for prolonged offloading devices, which are bearable by the patient. More importantly, Keller's arthroplasty reduces the need for multiple dressing and hospitalization by correcting the cause of recurrent ulceration, which saves money in the long term.

Keller's arthroplasty is not risk-free, though, like any surgical procedure. Patients with peripheral arterial disease or poor glycemic control are more susceptible to complications like infection, delayed wound healing, and transfer metatarsalgia. Consequently, a thorough preoperative evaluation that includes vascular assessment and glycemic management optimization is crucial to ensure favourable outcomes.[9, 10]

On the other hand, traditional dressing management provides a widely available, non-invasive option for the treatment of

diabetic foot ulcers. Dressings can be customized to meet the unique Requirements of the wound, offering protection from the elements, bacterial control, and moisture balance. In addition, contemporary antimicrobial dressings, like those based on iodine or silver, provide extra advantages in the treatment of infected wounds. By encouraging the formation of granulation tissue and decreasing wound size, negative pressure wound therapy in particular has become a useful adjunct in the treatment of large or complicated ulcers. Not with standing these developments, the biomechanical elements that lead to ulcer recurrence cannot be adequately addressed by traditional dressing management. Without adequate offloading, even well-managed ulcers are prone to delayed healing and recurrence, necessitating repeated interventions and prolonged treatment durations.[11,12]

The patient's clinical presentation and general health status should be taken into consideration when deciding whether to pursue Keller's arthroplasty or traditional dressing management. By addressing the pathological and mechanical causes of ulceration, Keller's arthroplasty may offer a conclusive treatment for patients with severe deformities, recurrent ulcers, or those who have not responded to conservative management. On the other hand, traditional dressing care continues to be the treatment of choice for patients with mild to moderate ulcers where there is minimal structural deformity. To secure an optimal treatment program that attains maximum results and avoids the risk of complications, team work among podiatrists, orthopaedic surgeons, endocrinologists, and wound specialists is crucial. [11]

Besides, Keller's arthroplasty also has long-term advantages going beyond ulcer healing.

Iradiacally reduces the incidence of major amputation with retention of mobility and independence in diabetic patients by avoiding recurrence of ulcer and minimizing the incidence of infection. Amputation rates reduction not only enhances the quality of life but also minimizes the economic impact caused by lengthy hospital stay, wound care, and rehabilitation.

Furthermore, since lower extremity amputations are linked to significant emotional distress, low self-esteem, and decreased social participation, the psychological effects of avoiding amputation cannot be disregarded. [12]

The aim of this study was to evaluate the comparative study between kellers arthroplasty vs conventional dressing in the diabetic foot ulcer patients.

AIM & OBJECTIVES

This study aims to analyse the effectiveness and duration of healing between conventional dressing and kellers arthroplasty in diabetic foot ulcer wound.

METHODOLOGY

Study Design: A prospective comparative study was used to design this investigation. In patients with diabetic foot ulcers, the study sought to compare the efficacy and length of wound healing between Keller's arthroplasty and traditional dressing. To guarantee an impartial distribution of participants among the study groups, a randomized approach was utilized.

Study Setting: The Government Thiruvavur Medical College Hospital's Department of General Surgery in Thiruvavur served as the study's location. The hospital provided the necessary facilities for surgical intervention,

wound dressing, and post-procedure monitoring of diabetic foot ulcer patients. The study was conducted over one year. During this period, data collection, patient follow-up, and comparative analysis of the two treatment modalities were systematically performed.

Participants–Inclusion and Exclusion Criteria:

Inclusion Criteria:

- Male and female patients diagnosed with diabetic foot ulcers.
- Ambulatory patients.
- Patients with grade3 diabetic ulcers.

Exclusion Criteria:

- Patients with non-diabetic ulcers.
- Patients diagnosed with peripheral vascular disease.
- Bedridden patients.

Study Sampling: The study utilized a randomized sampling method. 100 patients admitted with diabetic foot ulcers were randomly allocated into two study groups—one receiving Keller's arthroplasty and the other undergoing conventional dressing. This approach ensured the elimination of selection bias.

Study Sample Size: 100 people participated in the study. These people were split equally into two groups:

Study Groups: Two groups of participants were formed:

Group A; Patients who had Keller's arthroplasty

Group B: Patients who were treated for wounds using traditional dressings.

Study Parameters: This study's main parameters were the following:

- The clinical outcome of wound healing after dressing;
- The length of time it took for the wound to heal.

Study Procedure: Participants who met the inclusion criteria and had been diagnosed with diabetic foot ulcers were recruited for the study. One of the two study groups was assigned to them at random.

The intervention for each group was as follows:

- Group A: Underwent Keller's arthroplasty, a surgical procedure where a portion of the metatarsal bone was removed and replaced with soft tissue to promote healing and off load pressure.
- Group B: Received conventional wound dressing without surgical intervention. Patients were monitored post-intervention for a period of 12 weeks. The healing process, including the rate of wound closure, tissue granulation, and presence of complications, was documented. The final comparative analysis was based on these observations.

Study Data Collection: Data collection involved:

- Recording patient demographics and baseline clinical conditions.
- Documenting pre-procedure and post-procedure wound status through visual inspection and clinical assessment.
- Monitoring healing progress, including the presence of infection, granulation tissue formation, and wound closure.
- Recording any adverse events or complications.

Data Analysis: The collected data were entered into MS Excel and analyzed using SPSS software. The following statistical methods were applied:

- Mean and standard deviation calculations for continuous variables.
- Student's t-test to compare mean values between the two groups.
- Chi-square test to analyze categorical variables.

Ethical Considerations: Ethical approval for the study was obtained from the institutional ethics committee. All participants were provided with detailed information about the study, including the nature of the interventions and potential risks. Informed consent was obtained before participation. Patient confidentiality and anonymity were maintained throughout the study. Participants retained the right to withdraw from the study at any point without any consequences.

RESULTS

A total of 100 patients with diabetic foot ulcers were included in the study. Fifty patients underwent Keller's arthroplasty (Group A), while 50 patients received conventional dressing and wound care (Group B). The two groups were compared with respect to demographic characteristics, ulcer characteristics, healing, time to healing, recurrence and complications

Table 1. Baseline Characteristics of the Study Population

Variable	Category	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)	p-value
Age group (years)	40-49	8 (16.0)	9 (18.0)	17 (17.0)	

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	50–59	19 (38.0)	18 (36.0)	37 (37.0)	
	60–69	17 (34.0)	16 (32.0)	33 (33.0)	
	≥70	6 (12.0)	7 (14.0)	13 (13.0)	0.764
	Total	50 (100)	50 (100)	100 (100)	
Mean age (years)	Mean ± SD	59.2 ± 8.4	59.7 ± 8.7	—	
Sex	Male	34 (68.0)	32 (64.0)	66 (66.0)	
	Female	16 (32.0)	18 (36.0)	34 (34.0)	0.671
	Total	50 (100)	50 (100)	100 (100)	
Duration of diabetes	<5 years	7 (14.0)	8 (16.0)	15 (15.0)	
	5–10 years	19 (38.0)	18 (36.0)	37 (37.0)	
	11–15 years	17 (34.0)	16 (32.0)	33 (33.0)	
	>15 years	7 (14.0)	8 (16.0)	15 (15.0)	0.921
	Total	50 (100)	50 (100)	100 (100)	
Ulcer size at baseline	<2 cm ²	15 (30.0)	14 (28.0)	29 (29.0)	
	2–4 cm ²	25 (50.0)	26 (52.0)	51 (51.0)	
	>4 cm ²	10 (20.0)	10 (20.0)	20 (20.0)	0.979
	Total	50 (100)	50 (100)	100 (100)	
Wagner grade	Grade I	12 (24.0)	13 (26.0)	25 (25.0)	
	Grade II	25 (50.0)	24 (48.0)	49 (49.0)	
	Grade III	13 (26.0)	13 (26.0)	26 (26.0)	0.979
	Total	50 (100)	50 (100)	100 (100)	

The majority of patients were in the 50–59-year age group (37%), followed by 60–69 years (33%). The age distribution was comparable between the two groups, with no statistically significant difference ($p=0.764$). Males constituted the majority of the study population (66%), while females accounted for 34%. The difference in sex distribution between the two groups was not statistically significant ($p=0.671$), indicating comparable baseline characteristics. Most patients had diabetes for 5–10 years (37%), followed by 11–15 years (33%). The duration of diabetes was similar in both groups, with no statistically significant difference ($p=0.921$). The majority of ulcers measured 2–4 cm² (51%). The distribution of baseline ulcer size was comparable between the two treatment groups, with no statistically significant difference ($p=0.979$). Wagner grade II ulcers were the most common, accounting for 49% of the study population. Grade I and grade III ulcers accounted for 25% and 26%, respectively. The distribution of Wagner grades was comparable between the groups ($p=0.979$).

Table 2. Comparison of Complete Ulcer Healing Between the Two Groups

Healing status at 12 weeks	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)
Complete healing	44 (88.0)	18 (36.0)	62 (62.0)
Incomplete/non-healing	6 (12.0)	32 (64.0)	38 (38.0)
Total	50 (100)	50 (100)	100 (100)

Chi-square = 27.08; $p < 0.001$

Complete ulcer healing at 12 weeks was achieved in 88% of patients undergoing Keller's arthroplasty, compared with 36% of patients receiving conventional dressing. The difference was highly statistically significant ($p<0.001$), demonstrating a substantially higher healing rate following Keller's arthroplasty.

Table 3. Distribution of Patients According to Time to Complete Ulcer Healing

Time to healing	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)
≤4 weeks	20 (40.0)	4 (8.0)	24 (24.0)
5–8 weeks	20 (40.0)	10 (20.0)	30 (30.0)
9–12 weeks	4 (8.0)	4 (8.0)	8 (8.0)
Not healed by 12 weeks	6 (12.0)	32 (64.0)	38 (38.0)
Total	50 (100)	50 (100)	100 (100)

Complete ulcer healing within 12 weeks was considerably more frequent in the Keller's arthroplasty group than in the conventional dressing group. Forty percent of patients in the Keller's arthroplasty group healed within 4 weeks, compared with only 8% in the conventional dressing group. Conversely, 64% of patients receiving conventional dressing remained unhealed at 12 weeks compared with 12% in the Keller's arthroplasty group. The difference was statistically significant ($p < 0.001$)

Table 4. Comparison of Mean Healing Time Among Healed Ulcers

Treatment group	Number of healed ulcers	Mean healing time (weeks)	SD (weeks)	p-value
Keller's arthroplasty	44	5.2	2.1	
Conventional dressing	18	9.1	2.4	<0.001

Among patients whose ulcers achieved complete healing within 12 weeks, the mean healing time was significantly shorter in the Keller's arthroplasty group (**5.2 ± 2.1 weeks**) than in the conventional dressing group (**9.1 ± 2.4 weeks**), with a statistically significant difference ($p < 0.001$).

Table 5. Comparison of Ulcer Recurrence During Follow-up

Recurrence	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)
No recurrence	47 (94.0)	38 (76.0)	85 (85.0)
Recurrence	3 (6.0)	12 (24.0)	15 (15.0)
Total	50 (100)	50 (100)	100 (100)

Chi-square = 5.32; $p = 0.021$

Ulcer recurrence was observed in only 6% of patients who underwent Keller's arthroplasty compared with 24% of patients managed with conventional dressing. The difference was statistically significant ($p=0.021$), suggesting that correction of the underlying mechanical stress may reduce recurrence.

Table 6. Comparison of Treatment-Related Complications

Complication	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)

Wound infection	2 (4.0)	6 (12.0)	8 (8.0)
Wound dehiscence	1 (2.0)	3 (6.0)	4 (4.0)
Transfer ulcer	2 (4.0)	0 (0.0)	2 (2.0)
Delayed wound healing	1 (2.0)	12 (24.0)	13 (13.0)
No complication	44 (88.0)	29 (58.0)	73 (73.0)
Total	50 (100)	50 (100)	100 (100)
p-value			0.002

Treatment-related complications were less frequent among patients undergoing Keller's arthroplasty compared with those receiving conventional dressing. Complications occurred in **12%** of patients in the Keller's arthroplasty group compared with **42%** in the conventional dressing group. Delayed wound healing was particularly more frequent in the conventional dressing group (24% vs. 2%). The difference in treatment-related complications between the two groups was **statistically significant (p = 0.002)**.

Table 7. Overall Treatment Outcome at 12 Weeks

Treatment outcome	Keller's arthroplasty n (%)	Conventional dressing n (%)	Total n (%)
Complete healing without recurrence	44 (88.0)	18 (36.0)	62 (62.0)
Healed with subsequent recurrence	3 (6.0)	12 (24.0)	15 (15.0)
Persistent/non-healing ulcer	3 (6.0)	20 (40.0)	23 (23.0)
Total	50 (100)	50 (100)	100 (100)

Chi-square = 27.08; p < 0.001

At the end of the study follow-up, a favorable outcome was observed substantially more frequently among patients treated with Keller's arthroplasty. Complete healing without recurrence was achieved in 88% of patients in the Keller group compared with 36% in the conventional dressing group. Persistent ulceration was observed in only 6% of the Keller group compared with 40% of the conventional dressing group. The overall difference in treatment outcome was highly statistically significant (p<0.001).

DISCUSSION

The present comparative study demonstrated a clear advantage of Keller's arthroplasty over conventional dressing in the management of diabetic foot ulcers. Both treatment groups were comparable with respect to age, sex, duration of

diabetes, baseline ulcer size, and Wagner grade. This similarity in baseline characteristics strengthens the interpretation that the subsequent differences in healing were primarily related to the treatment strategy rather than major demographic or ulcer-related differences. Diabetic foot ulceration is a

multifactorial process involving neuropathy, abnormal biomechanics, repetitive mechanical stress, infection, and vascular impairment. Armstrong et al. emphasized that diabetic foot ulcers frequently recur because the underlying risk factors may persist even after apparent wound closure. [13]

Complete ulcer healing at 12 weeks was achieved in 88% of patients undergoing Keller's arthroplasty compared with 36% receiving conventional dressing, with a highly significant difference ($p < 0.001$). This finding supports the importance of mechanical offloading in diabetic foot-ulcer management. Bus et al. highlighted that effective offloading is a fundamental component of diabetic foot-ulcer treatment and recommended appropriate pressure-relieving interventions to facilitate healing.[14]

The present study also demonstrated a significant reduction in healing time following Keller's arthroplasty. Forty percent of patients in the Keller group healed within four weeks compared with only 8% in the conventional group. Among patients who achieved healing, mean healing time was 5.2 ± 2.1 weeks in the Keller group compared with 9.1 ± 2.4 weeks in the conventional dressing group ($p < 0.001$). Lazzarini et al. reported that more effective offloading interventions improve healing outcomes compared with less effective offloading strategies, supporting the importance of reducing mechanical stress during ulcer treatment.[15]

The high healing rate observed after Keller's arthroplasty is further supported by evidence specifically evaluating

surgical offloading procedures for diabetic hallux ulcers. Sanz-Corbalán et al. reported in their systematic review and meta-analysis that Keller and interphalangeal joint resection arthroplasties were associated with high healing rates and favorable healing times in patients with chronic diabetic hallux ulcers. Their findings support the concept that correction of the structural and mechanical abnormality can provide an advantage over conservative wound care alone.[16]

Ulcer recurrence was significantly lower after Keller's arthroplasty, occurring in 6% of patients compared with 24% in the conventional dressing group ($p = 0.021$). This finding is clinically relevant because healing the ulcer without correcting the underlying biomechanical abnormality may leave the patient vulnerable to recurrence. Monteiro-Soares et al. identified several patient- and disease-related factors associated with diabetic foot-ulcer development and recurrence, highlighting the importance of addressing modifiable risk factors after healing.[17]

Continued pressure reduction after ulcer closure may further decrease recurrence. Bus et al. demonstrated the importance of appropriate therapeutic footwear and offloading strategies in preventing recurrent diabetic foot ulcers.[18] Similarly, Bus et al. reported in a multicenter randomized controlled trial that custom-made footwear could reduce ulcer recurrence when appropriate pressure relief was maintained.[19] These findings support the need for continued postoperative footwear and preventive foot-care measures following Keller's arthroplasty.

Treatment-related complications were significantly less frequent in the Keller group in the present study, occurring in 12% compared with 42% of patients receiving conventional dressing ($p=0.002$). Delayed wound healing was particularly more frequent in the conventional group (24% versus 2%). Chen et al. emphasized that successful diabetic foot-ulcer healing requires a comprehensive approach that includes effective offloading, wound management, infection control, and optimization of factors that impair healing.[20]

The overall treatment outcome further reinforced the benefit of Keller's arthroplasty. Complete healing without recurrence was achieved in 88% of patients in the Keller group compared with 36% in the conventional group, while persistent or non-healing ulcers were substantially more frequent in the conventional group. Schaper et al. emphasized that prevention and management of diabetic foot disease should involve an integrated multidisciplinary strategy including wound care, offloading, infection management, vascular assessment, metabolic control, and preventive foot care.[21]

Peripheral arterial disease is another important determinant of diabetic foot-ulcer healing. Hinchliffe et al. emphasized the importance of assessing peripheral arterial disease in patients with diabetes and foot ulcers because impaired perfusion can significantly delay wound healing and increase the risk of adverse outcomes.[22] Similarly, Senneville et al. recommended appropriate assessment and management of diabetic foot infection, with treatment guided by clinical severity

and microbiological evaluation when indicated. [23]

The present findings therefore suggest that Keller's arthroplasty is an effective surgical offloading option for appropriately selected diabetic hallux ulcers, particularly when repetitive mechanical stress contributes to ulcer persistence or recurrence. Bus et al. emphasized that prevention of diabetic foot ulceration requires continued attention to mechanical stress, footwear, foot care, and other modifiable risk factors even after ulcer healing.[24] In addition, van Netten et al. highlighted the importance of preventive interventions in patients at high risk of diabetic foot ulceration, including regular foot assessment, appropriate footwear, education, and measures to reduce mechanical stress.[25]

Overall, the present study demonstrates that Keller's arthroplasty was associated with a higher healing rate, shorter healing time, lower recurrence, and fewer treatment-related complications than conventional dressing. These findings support Keller's arthroplasty as a valuable surgical offloading procedure for appropriately selected diabetic hallux ulcers. However, the sample size and duration of follow-up should be considered when interpreting the findings, and larger prospective studies with longer follow-up are required to establish the long-term durability of healing, recurrence prevention, functional outcomes, and complication rates.

CONCLUSION

The present comparative study demonstrates that Keller's arthroplasty is

more effective than conventional dressing in the management of diabetic foot ulcers, particularly in appropriately selected ulcers involving the hallux and forefoot. Although both treatment groups were comparable with respect to baseline demographic and clinical characteristics, the Keller's arthroplasty group achieved a substantially higher proportion of complete ulcer healing during the 12-week follow-up period. The improved healing outcome can be attributed to effective reduction of plantar pressure and mechanical stress at the ulcer site following resection of the proximal phalanx. In contrast, conventional dressing primarily provides local wound care without adequately addressing the underlying mechanical factors contributing to delayed healing and recurrence.

These findings suggest that Keller's arthroplasty can be considered an effective limb-salvage procedure and an important treatment option for selected diabetic foot ulcers, particularly when conservative wound management is insufficient. However, successful outcomes require comprehensive diabetic foot care, including optimal glycaemic control, infection management, regular wound assessment, appropriate footwear, and postoperative off-loading. Early identification of suitable candidates may further improve healing and reduce complications. Larger multicentre prospective studies with longer follow-up are recommended to validate these findings and assess ulcer recurrence, functional outcomes, and long-term limb preservation

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