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Diabetic foot ulcer assessment - A comprehensive guidance for physicians

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ABSTRACT

Early diagnosis and a multidisciplinary team approach to manage comorbidities is essential in treating Diabetic Foot Ulcerations (DFUs). The lifetime risk of a foot ulcer in patients with diabetes mellitus (DM) is high. DFUs are a major cause of morbidity in these patients. Infected or ischemic DFUs account for approximately 25% of all hospital stays for patients with DM. Based on data from the World Health Organization, lower extremity complications of DM are among the top ten conditions in terms of years lived with disability. Moreover, patients with DM with or without a foot ulcer have increased rates of depression. These observations illustrate the importance of prompt and appropriate treatment of DFU. The information in this review of guidelines is aimed to guide the healthcare professionals involved in the care of persons with DM and DFUs.

Key words: Diabetes mellitus; Diabetic foot ulcer; Healthcare professional; Assessment; Management

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INTRODUCTION

Diabetes mellitus (DM) is a serious and complex life-long condition affecting 422 million people worldwide. The majority of diabetic patients live in low and middle-income countries. 1.5 million deaths are directly attributed to diabetes each year.[1] The prevalence of diabetes has been steadily increasing over the past few decades. In India, around 77 million adult people suffer from Type 2 DM and nearly 25 million are prediabetics.[1] DM alone exhausts 5–25% share of an average Indian household's earnings.[2-4] In the past 3 decades, rise in the prevalence of type 2 DM has been noted in countries of all income levels. There is a globally agreed target to halt the rise in diabetes and obesity by 2025.[1]

Care for chronic diseases especially DM poses challenges as it requires patients' compliance to treatment and active effort for prevention and management of associated complications.[5] Caring for patients suffering with DM requires coordination across all tiers of healthcare systems. Most importantly the care is co-driven by the patient's knowledge, attitude, awareness, and perceptions about the disease, and understanding the importance of requirement and adherence to the treatment recommended.[5,6] The non-communicable disease (NCD) Monitoring Framework targets and indicators set by the Ministry of Health and Family Welfare, Government of India adapted from the Global NCD framework (the World Health Organization), has called for a need to halt the rise in diabetes and prevent premature deaths from NCDs by 25% by 2025.[7,8] Such targets can be met only with effective strategies at multisectoral levels.[9]

Diabetic foot ulcer (DFU) and amputation are the result of complications of diabetes such as peripheral arterial

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disease (PAD) and peripheral neuropathy (PN). Worldwide, the number of lower limb amputations has increased as a result of diabetes.[10] Foot ulceration is a major complication of DM and is associated with high morbidity and mortality, as well as significant financial costs.[11] The lifetime incidence rate of DFU is 19–34%, with a yearly increase rate of 2%.[12,13] After successful healing the recurrence rate of diabetes-related foot ulceration is 40% within a year and 65% within 3 years.[14] Therefore, the prevention of DFU is of paramount importance to reduce the risk of limb and/or life loss of patients with DM and prevention of economic and social burden to society.

PAD causes reduced blood flow due to the narrowing of arteries resulting in poor tissue oxygenation and medication delivery. Lower limbs PAD is common in DM patients. These together increase the risk for ulceration, impacts response to treatments, and patients' ability to heal them. PN occurs when the nerves of the peripheral nervous system are damaged (by diabetes) and can present with lower limb symptoms and signs, such as burning pain, loss of sensation, skin changes, deformities, and limited joint mobility of the foot. Other factors, such as inadequate self-care, poor glucose control, improper footwear, obesity, and lack of timely resources, complicate the situation as they already have components of PAD and PN. While the majority of ulcers eventually heal, approximately one-third may result in some form of amputation.[15] Non-healing DFU are at risk of infection if above-mentioned derangements and deformities remain uncorrected. Infected DFUs may require a range of treatments in the form of antibiotics, debridement, revascularization (angioplasty or lower limb bypass surgery), minor or major amputation, and foot deformity correction, this list in non-exhaustive with the pace of advancement happening in medicine. Non-healing foot ulcers and amputations incur huge costs on society, in the form of loss of wages, loss of jobs, prolonged hospitalization, lengthy rehabilitation, and requirement of home care with social services. With data suggestive of the burden of illness and the significant long-term health impact, the care of persons with DFUs demands a systematic, team approach from healthcare professionals.[14]

With the present understanding of DFUs and associated complications, the recommendations serve as an evidence-based guide for junior doctors and general surgeons, and other healthcare professionals to identify and assess people in high-risk groups who would benefit from systematic wound care. Interprofessional healthcare teams should work closely with patients and their families to address the complex lifestyle, self-care, and multiple treatment demands of people with DM and DFUs by keeping in mind that all DM patients are at risk of DFU in lifetime. Healthcare professionals should be able to facilitate and influence positive wound healing outcomes by promoting, collaborating, and participating in a Multi-Disciplinary Team (MDT) that follows best practice guidelines as presented in this document.

IDENTIFYING THE DFU

While planning treatment for foot ulcers, it is important to differentiate DFU from Pressure Ulcer. Etiologically of DFUs can be because of PN (Neuropathic DFU), PAD (Ischemic DFU), or a combination of neuropathy and PAD (Neuro-ischemic DFU). Infection is not the cause of DFU but is a consequence. Any ulcer below the ankle in mobile patient with DM is DFU, which may be present over bony prominences of the foot (Figure 1).

THE MAJOR RISK OF THE DEVELOPMENT OF DFU

Early identification of persons at high risk for DFU can aid in targeted monitoring and focused prevention efforts, whilst reducing unnecessary resource expenditure on low-risk persons. At-risk foot with skin damage if not managed correctly may deteriorate rapidly. Amputation in Diabetic foot is preceded by DFU in approximately 80% of cases.

Annual examination of a person suffering with DM for foot signs or symptoms is helpful in detecting at-risk foot. Following examination findings should be looked for in at-risk foot in person with DM.

1. PN: reduced sense of touch and pain and loss of protective sensation (LOPS).
2. Foot Deformity: Distal neuropathy causes small muscle wasting and muscle atrophy. Claw toe, Hammer toe, mallet toe, and hallux valgus are common. Neuropathy

Figure 1: Diabetic foot ulcer

also leads to ankle bone destruction, a condition referred to as Charcot's foot. This increased pressure where new bony prominences appear along with a shift of fat pad exacerbates the harmful effect of pressure.
3. Autonomic Neuropathy: Loss of sweating, dry skin, and callus formation which again increases the local pressure. Autonomic neuropathy can cause distended veins and warm dry foot. Thus, the foot may appear healthy but still be at risk.
4. PAD: Seen in 50% of Diabetic patients, especially in Type 2 Diabetic patients.
5. Previous ulcer or amputation.
6. Uncontrolled Blood sugar- causes diabetic immunopathy. This leads to aggressive infection in the form of Necrotizing fasciitis or cellulitis.

STAGES OF DFU DEVELOPMENT

With understanding of at-risk foot in patient with DM it is often possible to predicting DFU occurrence. In practice at-risk foot can present at different stages. At 7th Practical Diabetes International Foot Conference, Six Stages of a Diabetic Foot classification was described, and is an easy way of documentation of presentation and progress of DFU.

Stages of a Diabetic Foot

1. Stage 1 – Normal foot with no risk factors
2. Stage 2 – High-risk foot
3. Stage 3 – Ulcerated foot
4. Stage 4 – Cellulitic foot
5. Stage 5 – Necrotic foot
6. Stage 6 – Foot that cannot be rescued.

Refer to Figure 2.

MANAGEMENT OF DFUS DEPENDS ON

Treating DFU can be intimidating, especially when it presents with complications. Systematic approach in DFU with in following manner often rewarded with optimal outcome. First is to correctly assess to find the etiology of the ulcer. Second step should be to referral to a health professional and or team best qualified to manage the DFU. Moreover, third step should be involving the MDT approach while treating DFUs.

MDT can vary between institutions, but major team members helpful in DFU management are:[16]

- Surgeon or podiatrist trained in wound care or wound care nurse
- Vascular surgeon
- Plastic surgeon
- Intervention Radiologist
- Orthopedic surgeon
- Endocrinologist
- Infectious disease specialist
- Physiotherapist
- Dietician
- Orthotist
- Other specialties can be involved in MDT on a case-by-case basis.

PATIENT EDUCATION

A well-educated patient with respect to understanding risk factors and routine foot care is the center of successful DFU management. Patient education with regular reinforcement of blood sugar control, cessation of smoking, and use of custom-made footwear is of paramount importance in preventing complication of active or healed DFU.

ASSESSMENT OF DFU

In a person suffering with DFU assessment should include comprehensive history, ulcer assessment, assessment for diabetic peripheral neuropathy (DPN), and assessment of vascular status.

Patient history

Carefully taking note of the following details is helpful in history taking.

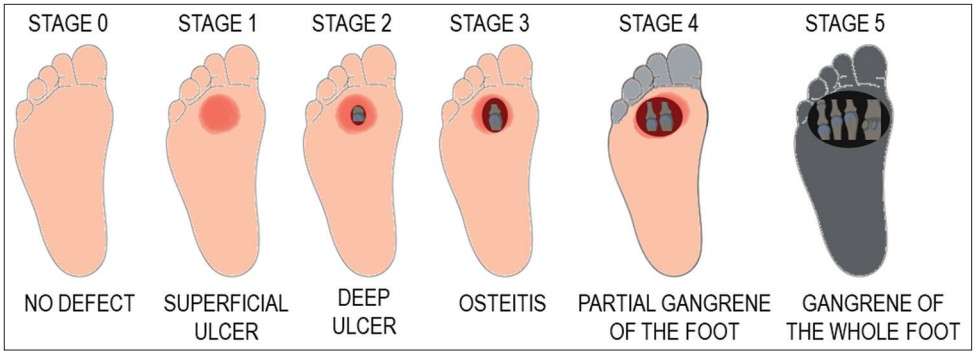

Figure 2: Stages of foot ulcer

1. Age and sex
2. Presenting foot complaints
3. Skin and nail problems
4. Medical History
5. Current medications
6. Antibiotic usage
7. Previous ulcerations or amputations
8. Family history of diabetes
9. Duration of diabetes
10. Glycemic control
11. Diabetic medication
12. Drug allergies
13. Cultural habits of walking barefoot
14. Use of footwear with/without socks
15. Type of footwear used – sandals, shoes, slippers
16. Daily activity level
17. Awareness of the requirement of foot care.

DFU examination should include:

1. General examination, assessment of lower limb condition with respect to lower limb hair, temperature, color, skin condition, hyperkeratosis, dryness, callus formation, etc.
2. DFU examination cannot be complete without examination for PN and PAD. Attention should be paid to, how the ulcer is being managed, who all are involved, and use of offloading in any form.

In practice "DIABETICS" mnemonic can be helpful in comprehensive foot examination.

- D - Deformity
- I - Infection
- A - Atrophy of nails
- B - Breakdown of skin
- E - Edema of foot
- T - Temperature rise
- I - Ischemia
- C - Callosities
- S - Skin color.

Nail changes are common with patients with DM. Nails can be thickened or there might be hypertrophy of the nail plate of the toenail. Nail thickening can present with or without deformity. Common nail changes for which patients visit include discoloration or a loss of translucency. Though onychauxis can be a natural part of aging, it is also a common symptom of diabetes.

Charcot foot deformity in patients suffering with DM is a foot condition responsible for recurrent medical help requirements. Charcot foot is because of PN causing Charcot arthropathy, a condition of the foot and ankle caused by an inability to sense injuries, which results in significant deformities (Figure 3).

Figure 3: (a) Hypertrophic nails, (b) Charcot's foot

Abnormally high plantar pressures in patients with DM are related and predictor to the development of plantar foot ulceration. It can be mapped easily with help of foot scanner. Values generated by it can reveal both static and dynamic pressure. For this the patient must stand and freely walk over the mat and a foot map is generated by computer program. Red areas on foot map generated suggest high plantar pressures, which are liable for ulceration. Yellow, green and blue areas suggest moderate, low, and very low plantar pressure areas respectively (Figure 4).

WOUND ASSESSMENT

Wound assessment in DFU can be much helpful by complete wound assessment to guide toward etiology causing it. Complete wound assessment should cover:

1. Location (Plantar, heel, metatarsal head, instep, dorsal, lateral)
2. Size
3. Depth including underlying tissue
4. Edge and Peri wound appearance
5. Exudate type
6. Visual appearance
7. Pain
8. Presence of infection and surrounding cellulitis and redness
9. Skin condition (dry or atrophic, fissures, cracks)
10. Temperature (Drop of skin temperature)
11. Presence of callus
12. Deformity associated (Hammer toe, prominent metatarsal head, Charcot foot)
13. Previous toe amputation site
14. Various Nail disorders
15. Between the toe and nails presence of infection

"MEASURE" mnemonic may be useful in practice to completely assess wound;[17]

- M: Measure size
- E: Exudate amount and character
- A: Appearance, necrotic, sloughy, or granulating
- S: Suffering from pain

Figure 4: Images showing high plantar pressures

- U: Undermining, measured in cm and position of the ulcer
- R: Re-evaluation
- E: Edge.

GRADING OF WOUND

Multiple wound grading systems are in place for standard documentation and follow up of DFUs. They help to appreciate the severity of the wound. Newer Grading systems take vascularity and infection into account. Grading and staging can be done using one of the following grading and staging system (Table 1).

MICROBIOLOGICAL SPECIMEN COLLECTION

DFU related infections are often polymicrobial, and judicious use of antibiotics is recommended to avoid antibiotic resistance. Knowing bacterial causing DFU infection and its susceptible pattern can guide antibiotic treatment plan. Microbiological specimen preferably a tissue from DFU or if feasible bone culture in case of osteomyelitis in DFU should be collected on the first encounter.

PRINCIPLES OF SPECIMEN COLLECTION

Tissue Specimens should be collected before starting antibiotics.

1. The ulcer should be debrided and cleaned before specimen collection
2. The specimen should be transferred quickly to a transport medium to preserve it
3. The request should include tests for aerobic and anaerobic organisms and antibiotic sensitivity.

Table 1: Grading of wound

System	Description
WIFI	Wound, Ischemia, Foot Infection
SIMBAD	Site, Ischemia, Neuropathy, Bacterial infection, Area, Depth
Wagner	Stage 0–5, Graded for wound depth to gangrene
University of Texas Classification	Takes into consideration of wound depth with ischemia and infection
PEDIS	Perfusion, Extent/size, depth/tissue loss, infection, sensation

ASSESSMENT OF DEGREE OF MOBILITY AND DEFORMITY

Degree of mobility of person suffering with DFU determines post healing target to be achieved, Mobile patients having plantar pressure area DFUs points towards possible underlying DPN. Mobility may be reduced because of ischemia in DFU with underlying PAD. Thus, assessment of DFUs should include persons mobility history, with assessment of the footwear and assessment of any deformity in the foot.

ASSESSMENT OF DPN

Bony pressure area DFU can give clue of possible underlying DPN. DPN can present with range of symptoms from painful foot with tingling sensation to complete insensate foot.

At risk foot

Any diabetic patient with LOPS (Nylon Monofilament test and Vibration Perception Threshold [VPT]) is at risk of diabetic foot complications. NEURO TOUCH is used to evaluate Small and Large Nerve Fibers

Neuropathy and enable longitudinal tracking for better outcomes.

CLINICAL TEST FOR DIAGNOSIS OF DPN

Toe touch test

Furthermore, known as Ipswich Touch Test (IpTT) performs well against a recognized standard for ulcer prediction which is simple to teach, reliable, inexpensive, and always at hand. We should encourage the uptake of screening and detection of high-risk inpatients requiring foot protection. Sensitivity is 78.3% and Specificity is 93.9%. The IpTT involves lightly touching/resting the tip of the index finger for 1–2 s on the tips of the first, third, and fifth toes and the dorsum of the hallux. The major limitation of this test is that the pressure with the index finger cannot be controlled and excess pressure can give false negative results. If the test result is positive, then the patient should be referred for monofilament testing.

Nylon monofilament test

Semmes-Weinstein monofilament is used to test for DPN, which involves buckling or bending of the monofilament tip when a force of 10 g is applied against the area to be examined (Figure 5).

Figure 5: Nylon Monofilament test

Figure 6: Vibration perception threshold

Steps in monofilament sensation test

1. A person is made aware of how the monofilament sensation feels on his/her hand or inside of the wrist
2. A person is blindfolded or shielded from viewing the test
3. The monofilament is applied as described above to the tip of the toes and metatarsal head of the 1st, 3rd, and 5th toes
4. It should be applied in no rhythmic manner
5. Document monofilament sensation present or absent
6. Failure to demonstrate monofilament sensation at 2 or more sites in any of the foot suggests the person with DFU has LOPS.

VPT

Vibration sensation is one of the sensations lost very early in DPN, VPT test is a test which measures large nerve fiber functioning and vibration perception is normally poorer in the lower extremity.

Below are steps of VPT by 128 Hz tuning for, which is set to vibration by striking it on the palm for 40 s. It is applied on the dorsum of the great toe proximal to the nailbed (Figure 6).

1. Introducing by applying a vibrating tuning fork on the back of the hand on the bony prominence
2. Conducting test on both great toes' dorsum
3. Absent of sensation is VPT-positive
4. Alternating devices for the VPT test are VibraTip, an Electronic Tuning Fork, etc.

Other methods of determining DPN

Tactile Circumferential Discriminator (TCD) detects two-point discrimination on feet. The TCD is a new, portable sensory testing device used for a two-point discrimination test that can reflect large-fiber nerve function (two-point discrimination) (Figure 7). The device consists of a handheld disc with eight protruding rods of increasing circumference (numbered zero through seven). Rod zero is 12.5 mm in diameter, and rod seven is 40 mm. Scores are denoted as the lowest number of rods a patient can discriminate from rod zero and this is the threshold value of the TCD test. A score of six or higher is significantly correlated with neuropathy.

Figure 7: Foot Pulse palpation

Electromechanical devices to measure the VPTs

Electromechanical instruments for VPT include Biothesiometer, Neurothesiometer, Manometer, Vibrameter, Vibration, and the CASE IV system. VPT by neurothesiometer values are graded as mild (15–20v), moderate (20–25v), and severe (>25v). It may extend up to 50v.

Ankle reflex

Unlike monofilament and VPT which assesses sensory component of neuropath, absent ankle reflex is suggests of motor neuropathy. It is associated with increased risk of ulcers in DM. Foot is slightly dorsiflexed to stretch Tendo Achilles (TA) and then TA is struck with a tendon hammer, to note if ankle reflex is present, absent, or exaggerated reflexes.

VASCULAR STATUS ASSESSMENT

Significant percentage of people suffering with DFU have underlying PAD. It is common finding for person with nonhealing DFU with PAD also to have associated PN. Thus, vascular assessment should be undertaken in DFU presenting in any form, with aim of determining if the person also needs an only vascular pathway of management.

Pulse palpation

Basic vascular evaluation in DFUs is palpating foot arteries. Knowledge of anatomical location of foot arteries and clinical skill in assessing is easy to remember and learn. The Anterior Tibial Artery is present at midpoint between two malleoli over talus bone, Posterior Tibial Artery (PTA) is felt just behind the medial malleolus over the medial surface of the calcaneus, and Dorsalis pedis artery (DPA) is felt between the 1st and 2nd metatarsal base, just lateral to the extensor tendon of the great toe over the navicular bone.

There is variance in documentation of foot pulse finding viz., foot pulse present or absent or Grade of pulsation felt (0, +, ++, or +++) depending on the understanding of the examiner. Whatever way of documentation is followed, person with absent or 0 reading patients should be urgently referred for further vascular assessment. For others clinical presentation should guide to decide. Clinically person with DFU and DPN have warm foot with bounding foot pulse because of arteriovenous fistula formation and can be misguiding. Low threshold for involving vascular specialist for difficult to treat DFUs is advised is such cases to avoid error.

Ankle brachial pressure index (ABPI)[18]

ABPI is a useful bedside test to determine lower limb circulation. It compares the blood pressure in the upper and lower limbs. It is the ratio of the highest systolic pressure in systolic pressure in the PTA and DPA at each ankle and brachial artery at each elbow (Table 2).

Steps for measuring ABPI

1. The patient should have 10 min of rest in supine position before conducting this test
2. The sphygmomanometer cuff is placed around the ankle just above the malleoli or up to 2.5 cm above the ankle.

Reading at the ankle from each foot with the help of a handheld doppler for PTA and DPA is recorded. The highest reading among PTA and DPA are noted, for each foot. The ratio between the highest Ankle pressures in each leg with the highest brachial pressure gives ABPI (Table 2).

In patients with DM ABPI ≥1.3 ABPI is because of the hardening of the wall of arteries and is called Medial Arterial Calcification. Thus, ABPI should not be used as a standalone screening tool in patients DM.[19]

Toe brachial pressure (toe brachial index [TBI])

TBI is a non-invasive way of determining arterial perfusion in feet and toes. It is the ratio of systolic pressure at the digital arteries of each toe of the foot with the highest systolic brachial pressure.

Normal systolic pressure in the toe is >50 mmHg.

TBI >0.7 is considered normal.

TBI <0.7 is indicative of PAD in diabetics.

TBI should be looked for in patients with DM with ABPI ≥1.3.

Doppler ultrasound

DFUs or patients with clinical examination suggesting possible associated PAD Doppler ultrasound study of foot

Figure 8: Doppler ultrasound

arteries can guide further planning of vascular intervention. It estimates the blood flow through the blood vessels by bouncing high-frequency sound waves. It gives information about the condition of arteries. It can be interpreted by audible sound or visual tracing (Figure 8).

Audible sounds are in the form of Triphasic, Biphasic, and Monophasic waves. Triphasic sound or wave indicates healthy artery. The third sound is visually seen as a dicrotic notch because of the elastic recoil of an artery. A biphasic sound or wave is seen when the elasticity of the artery is lost, indicating that the artery is hardened but not occlusive. Monophasic: is indicative of occlusive PAD.

Table 2: ABPI value interpretation

ABPI value	Interpretation	Action required
0.9–1.2	Normal	
≤0.9	Abnormal	Should undergo further evaluation
≥1.3	Abnormal	Common in DM and should undergo TBI for correct and complete vascular assessment

ABPI: Ankle brachial pressure index, DM: Diabetes mellitus, TBI: Toe brachial index

TREATMENT OPTIONS FOR DFU

It is important to understand DFU in multifactorial and multisystemic disease. MDT approach in treating DFU is accepted method of treating DFU. By end of DFU assessment we should be able to answer if it is associated with Vascular component, Infection, Pressure, and Sensation. It can be easily remembered as mnemonic VIPS.

- V- Vascular: Minimum Pulse palpation and if needed ABPI
- Infection: Signs of inflammation i.e., redness, swelling, slough, smell, and pain. Presence of Biofilm
- P - Pressure: Mobile or immobile patient. And the relation of wound or ulcer with a pressure point
- S - Sensation: touch test or monofilament test.

REFERRAL TO APPROPRIATE TREATMENT PATHWAY

This article has prepared a pathway approach along with MDT approach in DFU management is helpful in deciding treatment plans and arranging referrals to appropriate

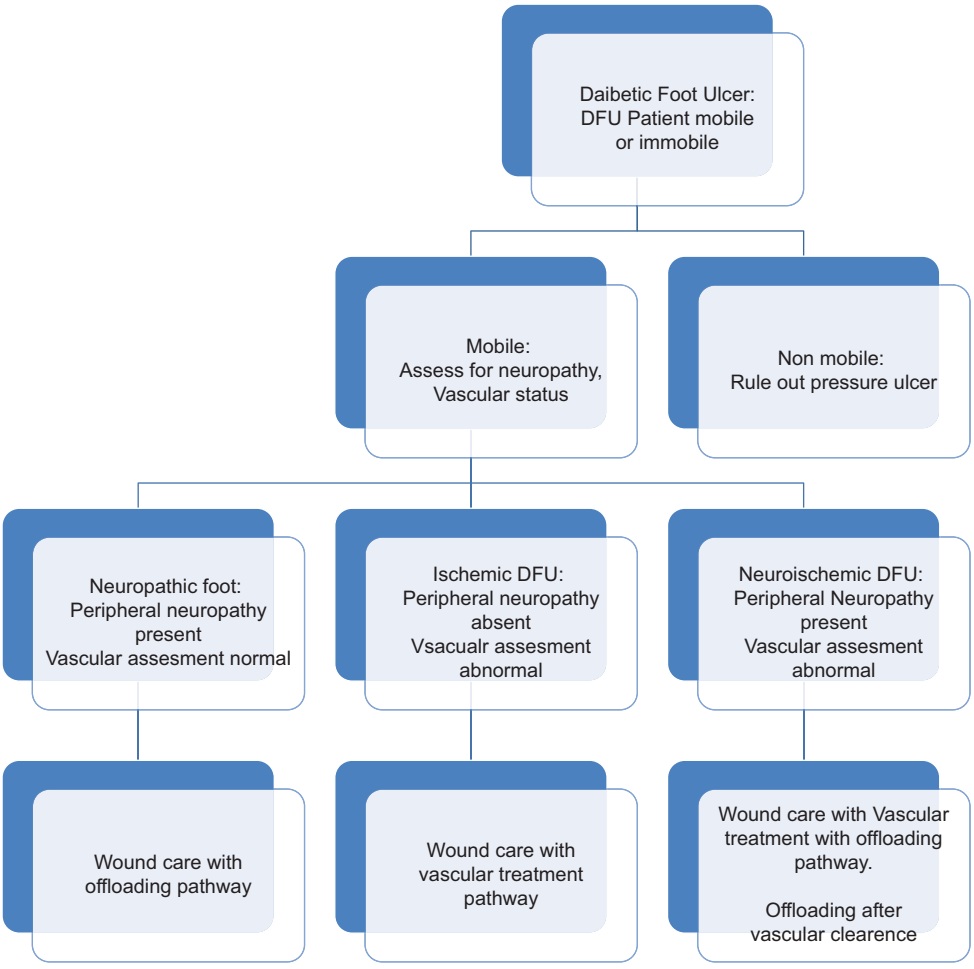

Figure 9: Referral for treatment pathway

specialty pathways.[20] Pathways described here can be considered as a guide, but each patient should be considered individually before utilizing this approach. Ischemic DFU should be referred to vascular specialist first and slowly integrating MDT for his management. Patients with Neuropathic DFU should be managed with offloading techniques, along with the MDT approach. Moreover, neuro-ischemic DFU may need both vascular intervention and offloading techniques together with MDT. However, in neuro-ischemic DFU offloading should be done after complete vascular assessment and treatment (Figure 9).

VASCULAR PATHWAY OF DFU MANAGEMENT

1. DFUs with absent or doubtful pulsation should undergo Doppler waveform evaluation with ABPI or TBI
2. DFU with ABPI between 0.9 and 1.2 or TBI more than 0.75 with triphasic waveform can be managed with wound care and offloading alone[21] (Figure 10).

Urgent revascularization should be considered if:
1. Toe pressure <30 mmHg
2. Trans-Cutaneous Pulse Oxygen ($TCPO_2$) <25 mmHg
3. Ankle pressure <50 mmHg

In a person suffering with DFU and with ABPI >1.3, TBI can be of help to rule out PAD. TBI of >0.75 with ABPI of >1.3 is suggestive of intact foot circulation and can undergo wound care with offloading. Any deterioration is followed up wound assessment should have low threshold for vascular involvement. TBI <0.75 with ABPI >1.3 should have vascular consultation before deciding a management plan.

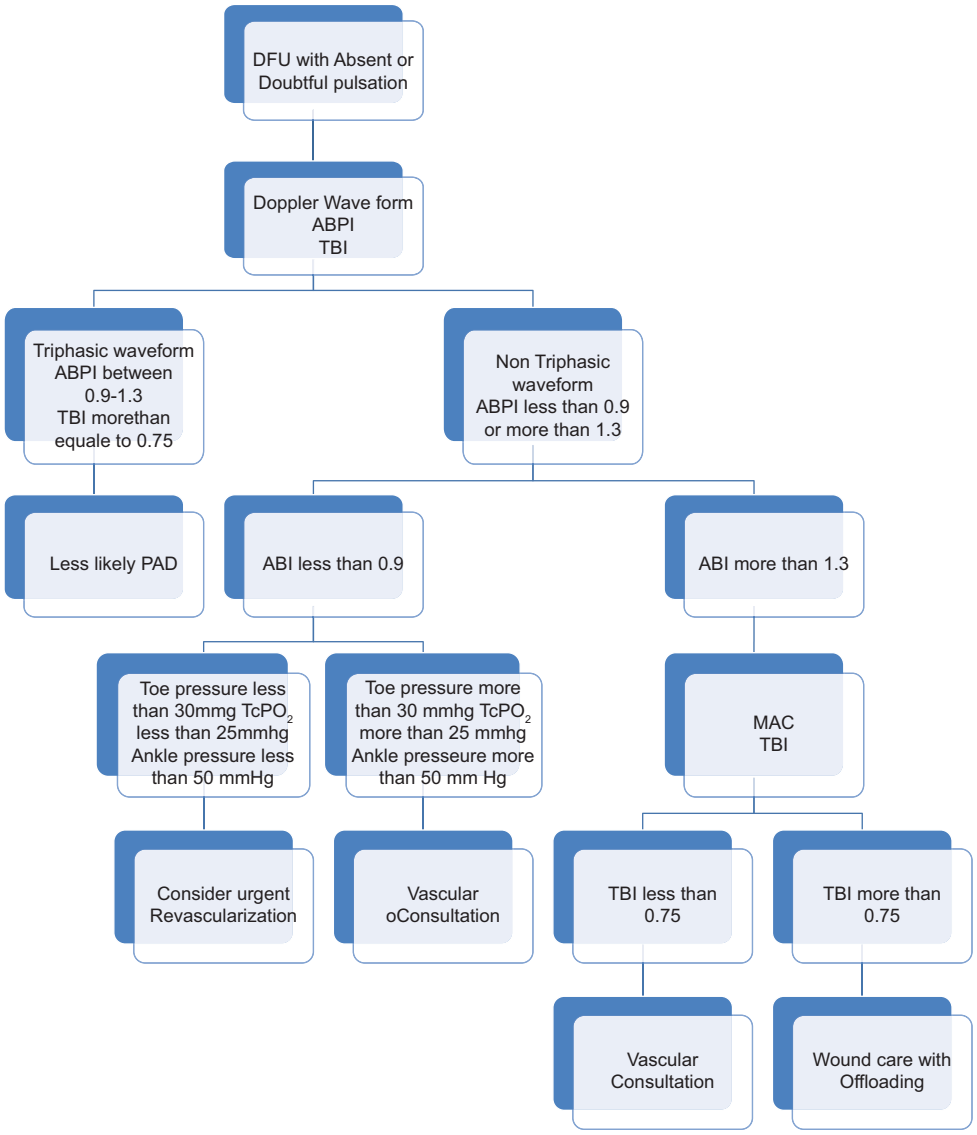

Figure 10: Vascular pathway for diabetic foot ulcer management

Figure 11: Offloading pathway for diabetic foot ulcer

OFFLOADING PATHWAY

All DFUs with plantar wounds should be offered offloading in conjunction with wound care, and infection control unless contraindicated (Figure 11). There are multiple ways DFU can be offloaded and they are broadly classified into non-surgical and surgical offloading.[22]

Non-surgical offloading

1. Non-removable offloading devices should be preferred for forefoot and midfoot plantar DFU unless contraindicated
2. Removable offloading devices should be offered if non-removable offloading is contraindicated or if the wound is infected clinically.

Surgical offloading

1. Ring External Fixators can be used for surgical offloading of DFUs
2. Flexor tenotomy should be opted if non-surgical offloading fails to heal toe tip DFU
3. Metatarsal neck osteotomy is a surgical offloading technique for non-healing ulcers of the plantar metatarsal area.

Plantar Metatarsal head ulcers that fail to heal after nonsurgical offloading can be considered for TA lengthening with aim of reducing forefoot plantar pressures.

Infection control and vascular treatment should always be the priority while treating DFUs, and offloading should be added to the treatment pathway as early as possible.

DFU REASSESSMENT AND REVIEW

Patients under any treatment pathway should undergo reassessment after 4 weeks of starting the treatment. Failure to reduce wound size by more than 50% at the end of the 4th week compared to the 1st day of initiation of treatment should be under reassessment and review for treatment pathway.

TEN COMMANDMENTS OF FOOT CARE IN DIABETICS

1. DO NOT walk barefoot
2. INSPECT the feet daily for blisters, wounds, bleeding, smell, increased temperature at Pressure points of feet, and edema
3. DO NOT apply hot fomentation/cold compresses/electric heating pads/strong counter-irritant ointments to legs and feet
4. USE correct footwear. Choose your footwear after consulting your doctor. Always wear footwear with socks of loose elastic
5. DO NOT walk bearing weight on an affected/ulcerated foot or after surgery
6. DO NOT sit cross-legged for a long time
7. DO NOT remove footwear during travel and place your feet on any hot surface. This can cause burns
8. CUT the nails regularly, trimmed square
9. DO NOT cut corns/calluses with a blade or a knife. Home surgery is dangerous
10. CLEAN the feet twice a day with soap and water. Wipe the web spaces dry and apply a softening agent to the feet. Do not use the Pumice Stone.

The Eleventh Commandment for Doctors – DO NOT AMPUTATE, if you can help it.

Credits - Diabetic Foot Society of India.

CONCLUSIONS

The authors have described the components of assessment and management that can help ensure the successful healing of foot ulcers in diabetic patients. These approaches should be used whenever feasible to reduce the high morbidity and risk of serious complications resulting from foot ulcers. Advances in treating chronic diabetic wounds are promising; however, the intrinsic pathophysiologic abnormalities that lead to ulcers in the first place cannot be ignored. No known therapy will be effective without concomitant management of ischemia, infection, and adequate off-loading. Not all diabetic foot complications can be prevented, but it is possible to dramatically reduce their incidence through appropriate management and prevention programs. The MDT approach that combines the expertise of various types of healthcare providers for diabetic foot disorders has been demonstrated as the optimal method to achieve favorable rates of limb salvage in high-risk diabetic patients.

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GJS- Conceptualized and designed the study, literature search, prepared first draft of the manuscript, critical revision of the manuscript; **SK-** Literature search, Interpretation, critical revision of the manuscript; **AB-** Concept of the study, literature search, review of the study; **SV-** Concept of the study, literature search, review of the study.

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