

Review Article

Amit Jain's system of practice for diabetic foot: the new religion in diabetic foot field

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ABSTRACT

Diabetic foot is a known public health problem and a devastating complication of diabetes that is known to lead to amputation. Past decade has seen various new developments in field of diabetic foot. Amit Jain's system of practice for diabetic foot is one new such development that was developed for improvising and standardization of diabetic foot. Various new concepts were laid down under this system, thereby creating a separate system that can be equated or considered to be a new religion in diabetic foot field.

Keywords: Amit Jain, Diabetic foot, India, Religion, System

INTRODUCTION

Diabetes mellitus affects more than 29 million people in United States and around 415 million people worldwide.¹ India alone home's around 69.1 million patients with diabetes and is considered to have second largest number of diabetes patient in world.²

Diabetic foot is undoubtedly a growing problem and it is one of the ignored conditions in developing country like India.³ It is a well-known fact that there is a difference in diabetic foot between Asian and Caucasian population.^{2,4} One best example is that of neuropathy is much more common than prevalence of ischemia in diabetic foot.⁵

In spite of knowing the various differences, most concepts in diabetic foot were often followed from western literature ranging from classification of diabetic foot to management and offloading of diabetic foot.^{6,7} The author developed a new principle and practice of diabetic foot for improvising and standardizing diabetic

foot practice around the world.^{8,9} Later various other concepts were added converting it into Amit Jain's system of practice of diabetic foot.¹⁰⁻¹²

With development of various new concepts and a system in diabetic foot quite distinct from all other concept in the diabetic foot from western literature, the author grouped his entire work into a different system thereby converting it into a new religion for diabetic foot which could be followed by any health care professional around the world who believed in these new concepts and who wants to incorporate it in his practice.

NEW CONCEPTS OF AMIT JAIN SYSTEM OF PRACTICE

Amit Jain's classification for diabetic foot complications

Most of the people around the world were following 2 common classification namely the Wagner's

classification and the University of Texas classification.^{6,13} However, over decades people considered these classifications for diabetic foot on whole whereas they were actually meant for diabetic foot ulcers only.⁶ This led the author to propose the first comprehensive classification for diabetic foot complication that encompassed all the common lesions in diabetic foot seen universally. This broad classification is today the simplest classification and the only classification that includes most lesions seen in clinical practice. The Amit Jain's new three tier classification system divides diabetic foot into 3 simple types namely type 1, type 2 and type 3 diabetic foot complication (Table 1).¹⁴

Table 1: Amit Jain's classification of diabetic foot complications.

Type of complications	Lesions
Type 1 diabetic foot complication (infective)	Wet gangrene, abscess, necrotizing fasciitis, etc
Type 2 diabetic foot complication (non-infective)	Neuropathic/trophic ulcers, hammer toe, claw toes, diabetic bullae, Charcot foot, dry gangrene, etc
Type 3 diabetic foot complication (mixed)	Ex- non-healing ulcer with osteomyelitis

Nather et al, considers a classification to be good if it includes all the 3 elements of diabetic foot namely the neuropathy, vasculopathy and the infection (Immunopathy).¹⁵

A classification should also provide a better documentation and communication between members of diabetic foot team and guide to the clinical outcome of the patients.¹⁵ Amit Jain's classification fulfils these criteria's as it is simple, include all 3 triad of diabetic foot, provides a better documentation of the lesion and communication and gives an overall outcome of the 3 categories.

Various studies done on this classification found that type 1 diabetic foot complication are the commonest cause for admission in hospital.¹⁶⁻¹⁸ Studies also concluded that type 1 diabetic foot complication are the most common cause of major amputations in developing country like India, with 76.9% of patients who underwent major amputation had type 1 diabetic foot complication.^{8,16}

Jain et al also showed for the first time that type 1 diabetic foot complication are the most common cause of mortality (78.38%).¹⁹ Nather et al failed to review and refer these studies in his article suggesting how to choose a classification with advantages and disadvantages of various classifications on diabetic foot.¹⁵

Amit Jain's classification which is the first component of Amit Jain's principle and practice can be considered as an umbrella for the remaining classification of Amit Jain's. This classification was recently validated.^{16,18}

Amit Jain's scoring system for diabetic foot

The author proposed its first surgical scoring system that predicts the risk of major amputation in diabetic foot complication.^{8,13,20} The surgical scoring has 16 factors and it includes clinical, anatomical, radiological and surgical finding that is unique of this scoring system.²⁰ Various studies have shown that more than 80% of major amputation done in diabetic foot had a score or more than 16.^{8,21} This scoring system has been well validated.²¹

Amit Jain's grading system for debridement

Surgical debridement is the most commonly performed surgical procedure in diabetic foot and the first comprehensive classification system for grading surgical debridement was proposed by Amit Jain in 2013 which was later modified.²²⁻²⁵

This grading system is divided in to groups and subgroups based on structures removed, extent of debridement and repetition of debridement and can be coded as G.E. R [Grade, Extent, Repetition] and can be used like TNM staging system used in oncological practice.^{23,24} Grade 2 debridement has been shown to be the commonest debridement done on diabetic lower limb in some studies.^{22,25}

Amit Jain's classification for osteomyelitis

This is also a first new classification that was specific for osteomyelitis in diabetic foot.^{13,26} This classification divides diabetic foot into 3 simple types and 4 subgroups.²⁶ Jain et al showed that type 1 diabetic foot osteomyelitis was the most common of osteomyelitis accounting for 57.14% cases with subtype C being most common.²⁷

Amit Jain's staging system for cellulitis in diabetic lower limb

Yet again, this is the first simple classification for cellulitis in diabetic lower limb (Table 2). According to this staging system, cellulitis can be classified into 4 sequential progressive stages.²⁸ Jain et al, showed that stage 2 cellulitis is the commonest presentation to a hospital. This staging has been well validated recently and it has shown that people with higher stages are more likely to undergo multiple surgeries and amputation.³⁰

Table 2: Amit Jain's staging for cellulitis in diabetic lower limb.

Stages of cellulitis	Clinical description
Stage 1	Cellulitis without abscess or skin necrosis
Stage 2	Cellulitis with abscess or skin necrosis
Stage 3	Necrotizing fasciitis without myonecrosis
Stage 4	Necrotizing fasciitis with myonecrosis

Amit Jain's classification for diabetic foot ulcer

This simple new classification for diabetic foot ulcer was proposed in 2014 as an addition to Amit Jain's principle and practice of diabetic foot.³¹ It classifies diabetic foot into 3 simple classes namely, simple, complex and complicated diabetic foot ulcers (Table 3).³¹

Table 3: Amit Jain's classification of diabetic foot ulcer.

Class of diabetic foot ulcers	Description
Class 1 diabetic foot ulcers	Simple ulcers
Class 2 diabetic foot ulcers	Complex ulcers
Class 3 diabetic foot ulcers	Complicated ulcers

Amit Jain's coding for diabetic foot ulcer

This coding system for diabetic foot ulcer was proposed by author to equate it with TNM staging commonly used in oncology.³² It divides diabetic foot ulcer based on size of ulcer, anatomical region involved and class of ulcer and is abbreviated as SAC coding system.³² The author strongly recommends on usage of this method just the way TNM staging is used.

Amit Jain's triple assessment for diabetic foot

This is a simplest and fastest screening tool from Indian subcontinent that was recently proposed, and it effectively addresses the triad of diabetic foot through the look, feel and test (LFT) component of assessment.¹¹ This screening tool serves to be a minimum mandatory requirement for evaluating a foot in diabetic patient and documenting it in patients case sheets.¹¹

Amit Jain's offloading system

This new offloading system was developed as an alternative to felted foam.¹⁰ It has a better and superior quality compared to felted foam. The standard offloading system combines MCR and Ethyl vinyl acetate which are viscoelastic material with specific properties.¹⁰ A recent study on this offloading showed that 86.90% of the wounds can be healed within 16 weeks using this offloading system.³² Amit Jain's offloading is a simple, synthetic, category 1 offloading and is Amit Jain's level 1 offloading recommendation in clinical practice.

Amit Jain's law's in diabetic foot field

The author proposed various laws in diabetic foot for the first time in this field. Each law was proposed with some purpose.

Amit Jain's law of offloading in diabetic foot

This law states that any viscoelastic/elastic materials used in isolation or in combination in thickness of acceptable

range like felted foam should be considered to be a variation of Amit Jain's offloading system. This law was proposed to avoid plagiarism of technique and to avoid any naming on any modifications.^{32,33}

Amit Jain's law of coding in diabetic foot

This law states that irrespective of whichever diabetic foot ulcer classification is used and its concurrent coding like SAC coding, SAS coding, etc or any subsequent modification made on this coding system, all of them shall remain Amit Jain's Coding system for diabetic foot Ulcer.¹² This law also was stated to avoid any plagiarism or any subsequent naming of any modification of the coding system.¹²

Amit Jain's law of classification in diabetic foot

This law states that diabetic foot, a complex disease, is multi-factorial, multi-pathological, multi-anatomical with multi-level involvement and multi-systemic complications requiring multi-disciplinary involvement. Hence, it is impossible for a single classification for diabetic foot to predict the outcome in each and every patient and to guide specific treatment for each patient using a single classification that encompasses many lesions in diabetic foot.

This law shall henceforth stop researchers from looking for a perfect classification for diabetic foot on whole that addresses every issue raised and fulfil their unrealistic expectation from each classification.^{15,31} Rather combination of classification should be encouraged in future. For example- Amit Jain's classification for diabetic foot complication for description and placements of lesion and Amit Jain's scoring system for predicting the risk of major amputation (Figure 1-3).



Figure 1: Patient with non-healing ulcer of 5 months over forefoot that got infected showing abscess and gangrene. This is Amit Jain's type 3 diabetic foot complication.

The more the lesions in a diabetic foot classification, the less the likeliness of classification to give complete treatment guidelines as each lesion has different

management. Specific classification for particular lesion like for ulcer or cellulitis, are more likely to have specific guidelines and outcomes.



Figure 2: The above patient being subjected initially to transmetatarsal amputation. As per Amit Jain's scoring, his score was ulcer 2 + gangrene 2 + pus 4 + cellulitis 6 + gas upto midfoot 2 = 16, which renders the patient to high risk for major amputation.



Figure 3: Above patient who actually ended up in major amputation with infected stump postoperatively.

One needs to understand that there is a clear difference between a classification and a scoring as classifications are more descriptive whereas scoring is numerical and give a better idea of severity.³⁴ Further, expecting a classification to give a follow up plan is an unrealistic expectation.¹⁵

There is various other contribution of the author like Amit Jain's Project, Amit Jain's Award, etc which is currently out of scope of this article.³⁵

CONCLUSION

The approach and understanding of diabetic foot has changed and achieved a new outlook with Amit Jain's system for diabetic foot. Having multiple different new concepts that has changed the way diabetic foot is perceived, the Amit Jain's system is undoubtedly a new religion for diabetic foot field. A specialist will require an

understanding of this entire new religion in thorough depth before concluding on any of its component as the entire gamut of Amit Jain's concepts work in combination.

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