

A New Classification for Diabetic Foot Problems

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Abstract: Diabetic foot is a devastating complication that can result in amputation which can lead to poor quality of life and repeated problems. Often, it is said that prevention of such problems is much more rewarding than treating the problem which can further lead to myriad of problems. The author divides the diabetic foot problems into 6 simple categories. This article aims to discuss them briefly in this new classification.

Keywords: Diabetic foot, Problems, Amit Jain, Classification.

INTRODUCTION

Diabetic foot is a common and distressing problem occurring worldwide. It causes an increased morbidity, mortality that can occur due to amputation (Khan, Y. *et al.*, 2017). Diabetic foot is in fact a leading cause of amputation today (Khan, Y. *et al.*, 2017). Diabetic foot ulcers are known to precede amputation in 85% of the cases (Khan, Y. *et al.*, 2017; Lacle, A. & Valero-Juan, L. F., 2012). The annual incidence of foot ulcers is around 2.2-5.9% (Hadi, A. A. *et al.*, 2019).

The author derived a new classification consisting of amalgamation of all problems in diabetic foot [Figure 1] and divided them into 6 categories (Table 1) as follows.

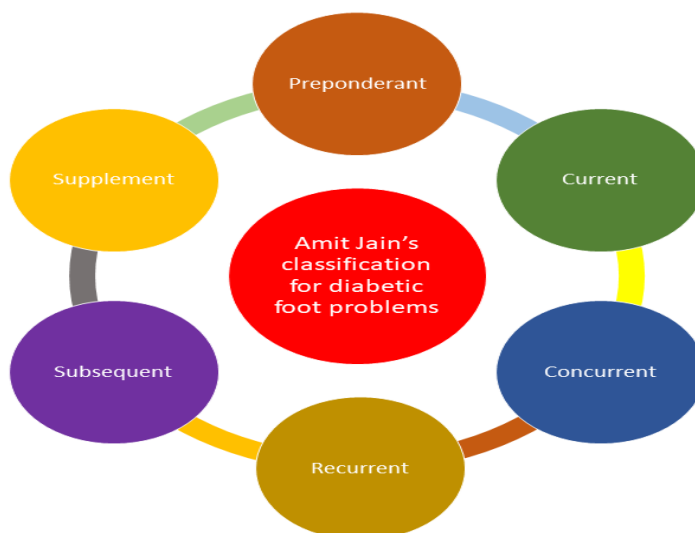


Figure 1: Amit Jain's classification for diabetic foot problems

Table 1: Amit Jain's classification for diabetic foot problems

Categories of foot problems	Type	Examples
Category 1	Preponderant	Diabetes mellitus
Category 2	Current	Gangrene, Abscess, Ulcer, etc
Category 3	Concurrent	Hypertension, CKD, IHD, etc
Category 4	Recurrent	Re-ulceration, Re-admissions, etc
Category 5	Subsequent	Mortality, Major amputations, etc
Category 6	Supplement	Loss of job, Financial issues, etc

CATEGORY 1 – PREPONDERANT PROBLEM

The preponderant problem is the diabetes mellitus. This chronic non communicable disease is a global epidemic (Khan, Y. *et al.*, 2017). Diabetes affects the health, social and economic status globally (Hadi, A. A. *et al.*, 2019). It was estimated that there were 425 million people having diabetes worldwide in the year 2017 (Abdissa, D. *et al.*, 2020). A person with diabetes has 25% lifetime risk for developing diabetic foot ulcer (Abdissa, D. *et al.*, 2020). Hence, diabetes is a principal problem for the diabetic foot.

CATEGORY 2 - CURRENT PROBLEMS

Patient can be affected with any one of the pathological lesions like gangrene, ulcer, abscess, etc. Diabetic foot patients can have infective complications (Type 1 diabetic foot complications) like wet gangrene, cellulitis, abscess, etc (predominantly acute in nature), non-infective complications (Type 2 diabetic foot complications) like trophic ulcers, Charcot foot, toe deformities, etc (predominantly chronic) or they can have Type 3 diabetic foot complications like trophic ulcer with osteomyelitis (acute on chronic) (Gopal, S., 2018).

CATEGORY 3 - CONCURRENT PROBLEMS

These consist of hypertension, ischemic heart disease, chronic kidney disease, etc. A recent study on diabetic foot by Jain *et al* showed that 60% of them have hypertension, 16.7% had ischemic heart disease (IHD), 13.3% had chronic kidney disease (CKD) and diabetic retinopathy each (Jain, A. K. C. & Viswanath, S, 2019). Presence of these problems can be detrimental in diabetic foot management. For example, studies have shown that presence of CKD is associated with increased risk of ulceration and amputation (Margolis, D. J. *et al.*, 2008).

CATEGORY 4 - RECURRENT PROBLEMS

Diabetic foot is a lifelong problem and once a complication occurs in foot, there are high chances of its recurrences. Some studies have shown that ulcer recurrences can be as high as 40% (Del Core, M. A. *et al.*, 2018). Even acute infective pathologies (example-cellulitis) can be recurrent (Jain, A. K. C. & Viswanath, S, 2015). There are further problems of re surgeries and recurrent admissions (Mc Callum, R. & Tagoe, M, 2012; Ang, C. L., 2013). Ang *et al* observed that almost half of their diabetic foot patients were readmitted (Ang, C. L., 2013).

CATEGORY 5 - SUBSEQUENT PROBLEMS

Once a patient has amputation being done for diabetic foot, it does not mean that he will be free from other problems arising from it. Many patients will have to use prosthesis in case they underwent major amputation (Vishwakarma, N. *et al.*, 2019). Prosthesis related problems are well known. Even mortality after amputation is high and well known. Studies have shown that mortality at end of 1 year was around 22% in minor

amputations whereas it was 52% in major amputation (Silva, S. G. *et al.*, 2017).

CATEGORY 6 - SUPPLEMENT PROBLEMS

These problems include loss of job, social and psychological problem, financial problem, etc. A study by Viswanathan *et al* showed that diabetic foot patients spends around 32.3% of their income to treat their foot complications (Viswanathan, V. *et al.*, 2005). Employment issue and prevalence of psychiatric morbidity is also well known after amputation (Darter, B. J. *et al.*, Baby, S. *et al.*, 2018).

CONCLUSION

Diabetic foot problems are not without problems. Hence its best to prevent the foot problems at early stage and this can be done with education and early screening. Once a foot problem occurs, the patient may have a myriad of problems ranging from financial problems to even mortality apart from job loss. This new Amit Jain's classification consists of amalgamation of all diabetic foot problems. It is a simple descriptive classification which is easy to remember and serve as a good teaching tool.

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