

SHORT COMMUNICATION

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Amit Jain's diabetic foot "PENTAGON" - a new model

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Abstract

Teaching and training healthcare professionals like nurses and family physicians is essential in prevention of diabetic foot complications and subsequent amputation which can lead to poor quality of life. In a busy schedule and variety of conditions treated by them, simple and effective strategy that can be remembered with ease serves an efficient way to achieve the required goal. Amit Jain's diabetic foot Pentagon is a new concept that covers diabetic foot framework briefly and is an easy to remember acronym. This article discusses on this new concept which serves an important tool to understand diabetic foot in a simplified manner.

Keywords: Diabetic foot, acronym, pentagon, complication, amputation

Introduction

Diabetic foot complications and subsequent amputations due to it are preventable in more than 75% of the cases with screening and education [1]. Education should be both for patients and health care professionals. Nurses and family physicians are some of the healthcare professionals who play a very important role in early detection and prevention of complication in foot of diabetes patients [2].

Various novel strategies have been used in different parts of the world to address the above issues. The authors 'Amit Jain's project for diabetic foot' was one such effort to train healthcare professionals [3, 4].

Strategies to simplify the understanding of diabetic foot for primary health care professionals like nurses and general practitioners were employed by the author through Amit Jain's system of practice, the modern diabetic foot surgery, wherein the universal classification and a new screening tool were used to educate the health care professionals [5, 6]. The author later developed various new models for diabetic foot which serves excellent teaching tool [7, 8, 9].

Amit Jain's diabetic foot "PENTAGON" is one such new teaching model (Figure 1) which is an efficient education tool that covers briefly the framework (Figure 2) of diabetic foot [7]. The acronym "PENTAGON" is a simple and easy to remember tool and it serves to simplify diabetic foot for health care professionals including family physicians and nurses.

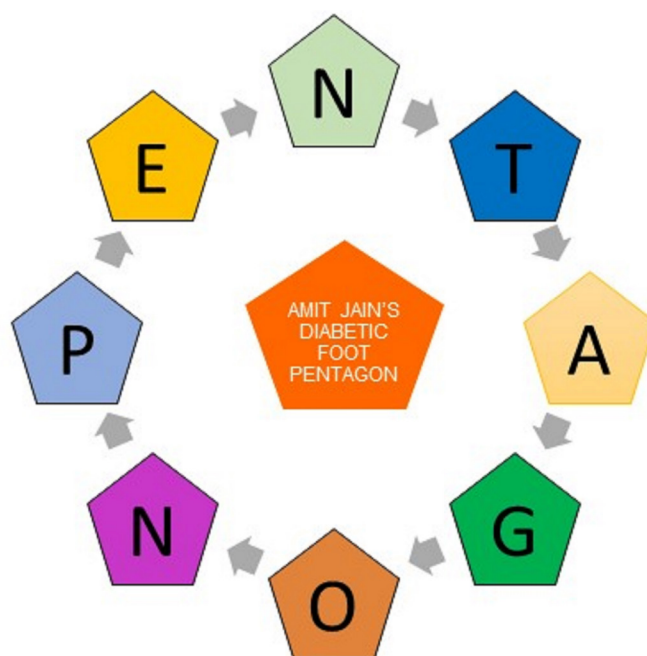
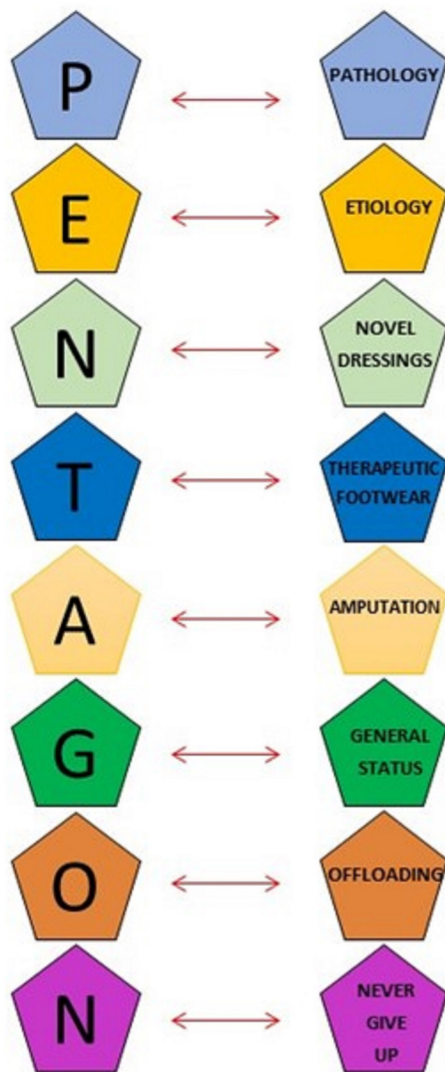


Figure 1. showing the Amit Jain's Diabetic foot Pentagon

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AMIT JAIN'S DIABETIC FOOT PENTAGON

Figure 2. showing the acronym PENTAGON covering the brief framework of diabetic foot

The PENTAGON is as follows

Pathological lesions. Diabetic foot has various other pathological lesions apart from ulcers and they are abscess, cellulitis, Charcot foot, necrotizing fasciitis, etc. Amit Jain's universal classification is currently one of the only descriptive classifications from India that includes all these lesions [5]. In type 1 diabetic foot complications, infection lesions are included like abscess, cellulitis, wet gangrene, necrotizing fasciitis, etc whereas in type 2 diabetic foot complications, non-infective complications like trophic ulcers, callus, Charcot foot, dry gangrene, etc are included. When any of the type 2 diabetic foot lesions get infected secondarily, then they are categorized in type 3 complications [5]. For example, when a trophic ulcer is infected or a dry gangrene gets secondarily infected, then they are type 3 complications. Most of the infected complications like abscess, wet gangrene, necrotizing fasciitis are acute in nature and require immediate intervention to salvage the limb. Often, patients give history of some trauma after which these

pathological lesions ensue in foot.

Etiology/Evaluation/Education. Diabetic foot is a triad of infection, ischemia and neuropathy [6, 10]. Patient often will have sensory, motor and autonomic neuropathy [10]. In an insensate foot, repeated trauma while walking can result in an ulcer or an injury with foreign bodies can result in acute infections like abscess or wet gangrene. Long standing diabetes, if uncontrolled, can lead to peripheral arterial disease which is aggravated if smoking habit is present. In diabetes, peripheral arterial disease is usually infrapopliteal [10]. Peripheral arterial disease is associated with higher risk of lower extremity amputation [11]. Amit Jain's evaluation tool addresses the above triad effectively and efficiently [6]. This screening tool can be used to educate health care professionals like doctors and nurses. Further, patients should also be educated and taught to inspect their feet frequently and take good footcare. Education is known to decrease the incidence of diabetic foot ulceration substantially [12].

Novel Dressings. There are various novel dressings available in market ranging from hydrogel, Foams, alginates, hydrocolloid, etc which can be used in diabetic foot wounds. Usages of these are often based on wounds characteristics [13]. These wound dressings can be divided into active, interactive and passive dressings [13]. These novel wound dressings enhance wound healing by providing moist environment apart from their antimicrobial properties, protection from trauma and by providing comfort [14]. Hydrogels are one of the popular choices of dressing among above [13].

Therapeutic footwear/ Team approach. One of the preventive strategies in diabetic foot is use of therapeutic footwear which is essential to protect the feet. Often therapeutic footwear is not used commonly in clinical practice and one can use the Amit Jain's footwear ladder to encourage the usage of footwear [15]. The lowest rung of ladder is barefoot walking and the highest rung is availability of complicated footwear's. Amit Jain's triangle of therapeutic footwear is a newly proposed teaching model that provides guidance to available diabetic footwear options [16]. Team approach is also needed when one encounters complex diabetic foot problems. There are studies which show that multidisciplinary team approach can improve outcomes in diabetic foot [17].

Amputation/Antibiotics/Adjunct therapy. Diabetic foot patients may require amputation surgeries or non-amputation surgeries like debridement. Amputations can be minor amputation or major amputations [18]. One can consider the use of Amit Jain's triangle of foot amputations (minor) to choose the best available option for successful foot salvage in case amputation becomes a necessity [15]. One may have to climb the Amit Jain's destructive/ amputation ladder when ever proximal amputation is needed [15]. Today, debridement is one of the most commonly performed procedures in diabetic foot [19]. Antibiotics are required in infections and must be used judiciously. One should always choose proper antibiotics to decrease the treatment cost, avoid antibiotic resistance and side effects. There are various adjunctive therapies that can help in healing wounds. Negative pressure wound therapy, oxygen therapy, hyperbaric oxygen therapy, etc are some of the available adjunctive therapies used in different parts of the world [20].

General status. While treating diabetic foot, one should also

evaluate the general status of the patients as they may have ischemic heart disease, chronic kidney disease etc which are important in outcomes of the patients. In a recent study by Jain et al [21], it was seen that around 60% of diabetic foot patients had hypertension, 16.7% had ischemic heart disease and 13.3% had retinopathy and CKD each [21].

Offloading/Orthotics. Always offload the foot especially in non-healing plantar ulcers and Charcot foot. There are numerous offloading available and one can use the Amit Jain's triangle of offloading that provides guidance on available options for offloading ranging from simple offloading like felted foam to complicated offloading like total contact cast [15]. Many patients will also require orthotics and prosthetics and they should be referred at right time for their usage.

Never give up. Various wounds in diabetic foot are chronic and may require long time to heal. Always have patience towards such patients, passion while treating diabetic foot and perseverance to achieve success.

Conclusion

Teaching in diabetic foot can be fun filled if it is simple, easy to remember and serves its purpose. Amit Jain's diabetic foot 'Pentagon' is one such effective acronym that aids in understanding diabetic foot in extremely simplified method for health care professionals like nurses and general practitioners.

Conflict of interests

The authors declare that they have no competing interests.

Financial Disclosure

The financial support no have.

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