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Review Article

Amit Jain's new 'rule of 3' for diabetic foot: an excellent compilation

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ABSTRACT

We have seen over last decade various new concepts in the field of diabetic foot. Most of them aimed at simplifying the concepts in diabetic foot. The latest concept being the Amit Jain's system of practice, a modern diabetic foot surgical approach, that was designed and created by Amit Jain, one of the pioneering Diabetic foot surgeon. This is the first new principle and practice in diabetic foot being proposed from Indian subcontinent that aimed at improvising and standardizing diabetic foot globally. Amit Jain's rule of 3 is the new concept which is an excellent compilation of all the 3's that can be seen in diabetic foot. This article throws a brief highlight on this new innovative rule.

Keywords: Amit Jain, Diabetes, Foot, India, Rule

INTRODUCTION

In spite of various advances being made over last 20 to 25 years in diabetic foot, it still remains to be a huge health care burden that leads to loss of productivity and amputation.[1,2] However, various attempts are being made in diabetic foot field to improve the overall understanding of this complex disease. Simplifying the concepts leads to a better understanding of this dreaded disease, dissemination of the knowledge worldwide, uniform approach and thereby improvement in overall care of diabetic foot disease. Amit Jain's principle and practice of diabetic foot is one such novel attempt that aimed to improvise and standardize the diabetic foot worldwide.

AMIT JAIN'S SYSTEM OF PRACTICE: THE MODERN DIABETIC FOOT SURGERY

The Amit Jain's system of practice for diabetic foot was designed and developed by Amit Jain, a renowned Pioneering Diabetic foot surgeon from India.[3-5] This system summates the entire work of Amit Jain thereby leading to modern diabetic foot surgical approach. This system has various new concepts like Amit Jain's classification for diabetic foot complications, the newly proposed universal classification.[5-8]

It has a scoring system predicting major amputation, modified grading system (classification) for debridement, a screening tool for diabetic foot, an ulcer classification, ulcer coding, an offloading classification, etc.[9-16]

RULES IN SURGERY

There are various rules and law's that exist in field of medicine and surgery overall and some of the well-known rules in surgical field are as follows.

The Rule of '2' for Meckel's diverticulum

According to this rule, it is present in 2% population, is within 2 feet from IC valve, is 2 inch in length and has 2 type of heterotropic mucosa.[18,19]

The Rule of '10' for pheochromocytoma

According to this rule, in 10 % of the cases it is malignant, in 10% it is bilateral, in 10% it is extraadrenal and in 10% it is familial.[19,20]

The Rule of '9' for burns

This rule aims at calculating body surface are involved in burns wherein the values of 9 are assigned to specific region.[19]

RULES IN DIABETIC FOOT

There is Rule of '15' in diabetic foot.[21] According to this rule, around 15% of all diabetic foot patients will develop ulcer in their foot sometimes during their lifetime, 15% of ulcers will develop osteomyelitis and 15% of ulcers will result in amputation. [21]

RULE OF '3' FOR DIABETIC FOOT[22, 23]

The recent new concept proposed was the Amit Jain's rule of '3'.[22] This new rule involves assimilation of all the '3's that can be seen in diabetic foot. The rule is divided into general that is anatomical rule and specific rule in diabetics and is uniquely an open rule wherein any new '3's in diabetic foot can be included in it without creating any extended or modified version.[22]

The various components in Amit Jain's rule of '3' are as follows.

- The Foot is overall divided into '3' parts namely Forefoot, Midfoot, Hindfoot.[23]
- There are '3' cuneiform bones in the foot namely medial, intermediate, lateral.
- There are '3' Phalanx in the toes of the foot namely proximal, middle, distal.
- There are 3 arches in the foot namely medial longitudinal, lateral longitudinal, transverse arch.[24]
- The foot has '3' plantar interossei.
- There are '3' muscles that is present in 3rd layer of foot namely flexor halluces brevis, flexor digiti minimi brevis, adductor hallucis.[23]
- There are '3' major forms of foot namely Egyptian, Roman, Greek.[25] The Egyptian foot is characterized by toes with decreasing length, from big toe to little toes. The Roman foot is a bit squat and wide wherein the first three toes are of the same length. The Greek foot has second toe taller than 1st toe.
- There are '3' main leg arteries supplying the foot namely anterior tibial artery, posterior tibial artery, Peroneal artery.[26]
- Diabetic foot is characterized by classical "triad" namely neuropathy, ischemia and infection.[27] It's also known as 'Trio'pathy.
- The neuropathy is of '3' types namely sensory, motor and autonomic neuropathy. [28]
- Amit Jain's 'Triple assessment for foot is the new evaluation tool for foot in diabetes. It can be basic evaluation (Screening) or detailed evaluation (Advance LFT).[14]
- Diabetic foot is classified into '3' main types of complications namely Amit Jain's type 1, type 2, and type 3 diabetic foot complications.[7-9] This is the newly proposed universal classification supreme for diabetic foot by Amit Jain and was the first component of Amit Jain's system of practice for diabetic foot.[5,8]
- Acute infections like abscess can occur at any of the following '3' sites namely, dorsum, plantar and interdigital areas.[14,22]
- Diabetic foot can be affected by any of the '3' gangrene's namely wet gangrene, dry gangrene and gas gangrene.[29,30]
- There are '3' common bony problems that are encountered in diabetic foot. The bony complications are toe deformities, osteomyelitis and charcot foot.[22,29]
- There are '3' common saggital planes lesser toe deformities.[20] They are claw toe, hammer toe and mallet toe.[31]
- There are '3' new classes (Amit Jain's new ulcer classification) of diabetic foot ulcers. They are divided into class 1, class 2 and class 3 diabetic foot ulcers.[15] These classes divide ulcers into simple, complex and complicated ulcers.[15]
- There are '3' components in Amit Jain's coding system for ulcer in diabetic foot. They are size, anatomical part and class of ulcer [S.A.C coding].[16]
- Amit Jain's debridement classification has '3' components. They are grade, extent and repetition [G.E.R].[13]
- The '3' commonest amputations that are done in diabetic foot are toe amputation, transmetatarsal amputation and below knee amputation.[32,33]
- Diabetic foot wounds can be offloaded with any one of the Amit Jain's '3' types of offloading. They are classified into simple offloading, complex offloading and complicated offloading (Amit Jain's classification for offloading).[17]
- The patients with diabetic foot at risk should be followed at least once in '3' months. There are various recommendations for diabetic foot follow-up ranging from 1 year to 3 months follow-up based on risk category they belong.
- Diabetic foot is governed by '3' Amit Jain's law.[5]

AMIT JAIN'S STATEMENT FOR DIABETIC FOOT

This statement for diabetic foot is as follows. [22]

"Diabetic foot is caused by a triad consisting of neuropathy, ischemia and infection with neuropathy being of 3 types. The triple assessment for foot should be the minimum evaluation tool for diabetic foot. The

diabetic foot complications can be categorized into any of the 3 types. Diabetic foot can be affected by many pathological lesions ranging from abscess that can occur at any of the 3 sites, any of the 3 gangrenes, any 3 bony problems with the lesser toes being affected with any 3 deformities or by ulcers that can be placed into any one of the 3 classes which can be coded with 3 components. One of the commonest surgical procedures on diabetic foot is debridement that can be classified in 3 components. Patients may end up in one of the 3 common amputations. Diabetic foot wounds can be offloaded with any one of the 3 types. The diabetic foot at risk should be followed at least once in 3 months. Diabetic foot is governed by 3 laws" [22]

CONCLUSION

The Amit Jain's rule of '3' is a new innovative compilation of all the '3's that can be seen in the diabetic foot. This unique new rule is believed to be the largest rule in the medical/surgical field and it is an open rule. The Amit Jain's rule of '3' needs to be complimented for the great efforts for collocating the '3's in diabetic foot.

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