IMPORTANCE OF RAW PAPAYA DRESSING IN DIABETIC FOOT ULCER – A CASE REPORT

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ABSTRACT
Diabetes mellitus is a metabolic disorder caused by absolute or relative deficiency of insulin. Diabetic foot is the most common complication of diabetes mellitus. It increases the morbidity and mortality of the diabetic patients and is the major cause of non-traumatic lower limb amputations. This is a great concern for the society and the government. The management of diabetic foot ulceration is based on the control of blood sugar, wound debridement, identification and management of infection, proper dressing and definitive wound closure. Enzymatic wound debridement is an emerging concept in accelerating the wound healing process. A detailed literature search, some review articles and a few planned studies show the effectiveness of raw papaya fruit on wound debridement. The present article reports wound healing potential of raw papaya in case of diabetic foot ulcer.

KEYWORDS: Diabetic foot, Limb amputations, Wound debridement, Papaya.

INTRODUCTION
Diabetes mellitus is a metabolic disorder caused by absolute (Type 1 diabetes) or relative (Type 2 diabetes) deficiency of insulin. Its prevalence in adults is around fourth world wide that is over 150 million persons are affected. Roughly 80% of people with diabetes are in developing countries, of which India and China share the larger contribution. It is estimated that in India the number of people with diabetes rise to 87 million by 2030.[1] Diabetic foot is the most common complication of diabetes mellitus and more than one third (33%) of diabetic patients are found to be at high risk for future foot ulceration. It increases the
morbidity and mortality of the diabetic patients. Diabetic foot is the major cause of non-traumatic lower limb amputations.[2] The management of diabetic foot ulceration is based on the control of blood sugar, wound debridement, identification and management of infection, proper dressing and definitive wound closure.

On the basis of traditional use and literature search, Carica papaya was selected to see the wound healing potential.[3] Carica papaya have antibacterial activity against various microorganisms including Staphylococcus aureus, Bacillus cereus, Bacillus subtilis, E coli, Enterobacter cloacae, Proteus vulgaris, Klebsiella pneumonia, Salmonella typhi, Pseudomonas aeruginosa and Shigella flexner. Raw papaya contain plenty of latex which is a rich source of four cysteine endopeptidases namely papain, chymopapain, glycyl endopeptidase and caricain.[3] Papita (Carica papaya Linn) is mentioned Mohallil (resolvent) in Unani medicine.[4] Reported activity of its latex (enzyme papain & pseudo carpaine) shows proteolytic action, prevents ulcers (gastro duodenal).[5]

Proteolytic enzymes have great role in enzymatic debridement in Ulcer/Wound healing. They are from family of proteins that serve to degrade necrotic debris derived from cell breakdown. Many such enzymes are currently available commercially and being promoted as alternatives to surgical wound debridement.[6] Papain, a proteolytic enzyme derived from the fruit of Carica papaya, is a potent digestant of nonviable protein matter. At the same time it is harmless to viable tissue. It is effective in removing dead cells, preventing burn wound infection, defibrinating wounds. It is active over a wide pH range from 3 to 12.[7]

CASE HISTORY
A 65 year old female patient, known case of type 2 NIDDM since 10 years was admitted at the inpatient department (Surgery unit) of NIUM with history of unilateral foot ulceration. The patient has been on treatment and was controlling her blood sugar with tablet Tribet-2 and tablet Diabezide-M. History of foot ulceration revealed that it occurred four months back, patient had undergone conventional treatment for diabetic foot with antibacterial therapy off and on, and local dressing before coming to institute with non healing of ulcer since four months.

On examination general condition of the patient was poor having low grade temperature (ranging from 99-100°F), blood pressure was 130/90 mm of Hg, and pulse rate of 80/min.
On local examination of left foot an irregular ulcer was present at the lateral aspect with erythema, mild local tenderness / inflammation and purulent discharge. Distal pulsation was present.

Patient was admitted and investigated. Her haematology report showed 10 gm% of Hb%, and her total leucocytes count was raised. Her fasting blood sugar was 140 mg/dl and her post parandial blood sugar was 226 mg/dl. Her swab culture and sensitivity report showed infection with Kleibsella pneumoniae and for this antibiotics were given to her according to sensitivity report. Her blood sugar was controlled with the help of physician by tablet Tribet-2 and Injectable Human mixtard 10 units. Her blood sugar fasting and post parandial was monitored every third day for the first fifteen days and then every week to assess her diabetic status. Gradually the dose of Injectable Human mixtard was reduced to 5 units and then patient was switched over to oral hypoglycaemic drug after achieving satisfactory blood sugar control.

Along with the control of infection and blood sugar slight wound debridement was done, particularly cutting of hard skin was done. An alternate day dressing of Ulcer was done with fresh grated papaya (initially done daily for one week). Fresh raw grated papaya pulp with skin and latex was first washed under sterile water then with normal saline then was grated on the side of skin containing latex and also raw pulp, and is applied directly on the ulcer after cleaning by putting it in sterilized gauze, by further covering it with sterilised gauze piece (Latex obtained by pocking raw papaya previously was also mixed with the grated part). Raw papaya dressing was continued till complete healing of the ulcer was achieved.
DISCUSSION

Complete healing of diabetic foot ulcer was achieved. Duration of complete healing with healthy granulation tissue and complete growing of epithelium (complete covering) was observed in study was 75 days. But healthy granulation tissue and growing of epithelium at the margin was observed in 35 days (Image 1-6). The microvascular, macrovascular changes and the neuropathy all contribute to changes in the lower extremity leading to diabetic foot which is the much dreaded complication of diabetes mellitus. These changes make diabetic foot more prone to trauma, ulceration and infection. Diabetic foot ulcer is the leading cause of hospitalisation and prolonged hospital stay which costs both in terms of economic burden and human suffering. It has been estimated that every thirty seconds a lower limb is amputated due to complication of diabetes. Primary goal in the treatment of diabetic foot ulcers is to obtain wound closure. Rest, elevation of the affected foot and relief of pressure are essential component of treatment along with optimal diabetic control, wound debridement, control of infection and local wound care with proper dressing.

Enzymatic wound debridement is an emerging concept in accelerating the wound healing process. Till date many enzymatic debriding agents like collagenase, pure papain and papain-urea have been tried in wounds for this purpose. A detailed literature search, some review articles and a few planned studies show the effectiveness of papaya fruit on wound debridement. Based on the above we decided to use raw grated papaya pulp with skin and latex as dressing material to improve and hasten the healing of the diabetic foot ulcer.

The action of papaya as a wound debriding agent is attributed to its enzymatic content and its antibacterial activity. Enzymes such as papain have the ability to dissolve dead tissue without damaging living cells and chymopapain aid in healing and development of healthy
granulation tissue. The case report may serve as a lead in developing the raw papaya dressing as one of the important treatment management strategy in diabetic foot ulcer.

CONCLUSION

Fresh raw grated papaya with skin and latex as a dressing material provides favourable outcome in a patient with diabetic foot ulcer by decreasing the duration of healing probably due to enzymatic micro debridement and antibacterial activity. Hence it is concluded that raw papaya would definitely prove beneficial in diabetic foot ulcers owing to the quick curative action, cost effectiveness and easy availability.

REFERENCES