

A CASE REPORT ON GANGRENE OF RIGHT FOURTH TOE**P. Naga Jyothi*¹, G. Sree Mahalakshmi¹ and Dr. A. Sandeep²**¹Pharm. D, Department of Pharmacy Practice, Santhiram College of Pharmacy, Nandyal.²Assistant Professor, Department of Pharmacy Practice, Santhiram College of Pharmacy, Nandyal.***Corresponding Author: P. Naga Jyothi**

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ABSTRACT

Gangrene is defined as focal or extensive necrosis of the skin and underlying tissue. However, this definition presents difficulties. There are several etiologies for gangrene, as there are for foot ulcers. One is LEAD (Lower Extremities Arterial Disease) of the large or small vessels, but infection and neuropathy may also play a role. Gangrene is better correlated with LEAD than is foot ulcer. The demonstration of clinical or subclinical LEAD is essential if gangrene is to be considered a manifestation of the progression of LEAD in the individual patient. The prevalence of gangrene is greater in selected diabetic patient populations than in the general community. However, prevalence is not a satisfactory indicator of the importance of gangrene in diabetes, compared with incidence, because of the poor survival experience of these patients and their consequent loss from the prevalent population. Risk factors for gangrene have not been adequately quantified for diabetic patients. They include LEAD, peripheral neuropathy, infection, trauma, and delayed healing. The grafting was done to reduce the spread of infection. Antibiotics like Amoxicillin + clavulanic acid and metronidazole along with some analgesics (Aceclofenac, tramadol) and anti-platelets like cilastazole for 2 weeks reduced the infection spread and may not lead to the further complications.

KEYWORDS: LEAD, gangrene, grafting, Antibiotics, Analgesics.**INTRODUCTION**

Gangrene is defined as focal or extensive necrosis of the skin and underlying tissue. However, this definition presents difficulties. There are several etiologies for gangrene, as there are for foot ulcers. One is LEAD of the large or small vessels, but infection and neuropathy may also play a role. Gangrene is better correlated with LEAD than is foot ulcer. The demonstration of clinical or subclinical LEAD is essential if gangrene is to be considered a manifestation of the progression of LEAD in the individual patient. The prevalence of gangrene is greater in selected diabetic patient populations than in the general community. However, prevalence is not a satisfactory indicator of the importance of gangrene in diabetes, compared with incidence, because of the poor survival experience of these patients and their consequent loss from the prevalent population. Risk factors for gangrene have not been adequately quantified for diabetic patients. They include LEAD, peripheral neuropathy, infection, trauma, and delayed healing.

Diabetic Gangrene

Diabetic gangrene and vasculature Atherosclerotic lesions in the arteries of diabetic patients occur at sites similar to those of non-diabetic individuals (such as arterial bifurcations), while advanced disease is more common in diabetic patients, affecting even collateral

vessels. The pathology of the affected arteries is similar in both those with and those without diabetes. Typical atherosclerotic lesions in diabetic patients with peripheral vascular disease include diffuse multifocal stenosis and a predilection for the tibioperoneal arteries. All tibial arteries may be occluded, with distal reconstitution of a dorsal pedal or common plantar artery. Diabetes has the greatest impact on the smaller vessels (diameter less than 5 mm) in the body. The atherosclerotic procedure starts at a younger age and progresses more rapidly in those who have diabetes than those who do not. Although non - diabetic men are affected by peripheral vascular disease much more commonly than non- diabetic women (a male- to- female ratio of 30:1, diabetic women are affected half as often as diabetic men. Gangrene is characterized by the presence of cyanotic, anesthetic tissue associated with or progressing to necrosis. It occurs when the arterial blood supply falls below minimal metabolic requirements. Gangrene can be described as dry or wet, wet gangrene being dry gangrene complicated by infection.^[2]

Wet Gangrene

A moist appearance, gross swelling and blistering characterize wet gangrene. Cellulitis (erythema) and the typical signs of inflammation are evident. Pus may be present. The patient may or may not be febrile, and pain

is present unless there is loss of pain sensation due to diabetic neuropathy. Small vesicles or yellow, bluish or black bullae may form, and eventually a black eschar covers the infected necrotic area this is an emergency occurring in patients with severe ischemia who sustain an unrecognized trauma to their toe or foot. Urgent debridement of all affected tissues and the use of antibiotics often results in healing if sufficient viable tissue is present to maintain a functional foot, together with adequate circulation. If wet gangrene involves an extensive part of the foot, urgent guillotine amputation at a level proximal enough to encompass the necrosis and gross infection may be life - saving. At the same time, bypass surgery or a percutaneous transluminal angioplasty needs to be performed, if feasible. Saline gauze dressings, changed every 8 hours work well for open amputations. Revision to a below -knee amputation may be considered 3 – 5 days later. Wet gangrene is the most common cause of foot amputation in persons with diabetes. It often occurs in patients with severe peripheral vascular disease after infection.

Dry Gangrene

Dry gangrene may be infected and progress to wet gangrene. Patients with dry gangrene who are awaiting a surgical procedure need education about meticulous foot care. It is extremely important for patients to avoid wet dressings and debriding agents, as their use may convert a localized dry gangrene to limb - threatening wet gangrene. Proper footwear is crucial to avoid further injury to the ischemic tissue. Dry gangrene is characterized by its hard, dry and wrinkled dark brown or black texture; it usually occurs on the distal aspects of the toes often with a clear demarcation between viable and necrotic tissue. Once demarcation has occurred, the involved toes may be allowed to auto amputate. However, this process is long (several months) and disturbing. In addition, many patients do not have an adequate circulation to heal a distal amputation. For these reasons, it is common practice to evaluate the arteries angiographically and perform a bypass or a percutaneous transluminal angioplasty with concomitant limited distal amputation, in order to improve the chance of wound healing. In the case of extended gangrene, amputation at a higher level is unavoidable.

Lower Extremity Arterial Disease (LEAD)

The incidence and prevalence of LEAD increase with age in both diabetic and non-diabetic subjects and, in those with diabetes, increase with duration of diabetes. Many elderly diabetic persons have LEAD at the time of diabetes diagnosis. Diabetes is an important risk factor for LEAD. Hypertension, smoking, and hyperlipidemia, which are frequently present in patients with diabetes, contribute additional risk for vascular disease. LEAD in diabetes is compounded by the presence of peripheral neuropathy and by susceptibility to infection. These confounding factors in diabetic patients contribute to progression of LEAD to foot ulcerations, gangrene, and ultimately to amputation of part of the affected

extremity. Prevention is an important component of LEAD management. By the time LEAD becomes clinically manifest, it may be too late to salvage an extremity, or it may require more costly resources to improve the circulatory health of the extremity. LEAD manifests itself by decreased arterial perfusion to the lower extremities. This decreased perfusion results in diminution or absence of peripheral pulses and may lead to intermittent claudication (pain on walking, relieved promptly by rest), proneness to infection, ulcerations, poor healing of sores and ulcers, gangrene, and ultimately to amputation. Intermittent claudication is indicative of clinical occlusive LEAD. Palpation of peripheral pulses has been used as a clinical tool to assess occlusive LEAD in diabetic and non diabetic patients, particularly when intermittent claudication is present. However, it is sometimes difficult to interpret the significance of diminished peripheral pulses when symptoms are not present. Ambient temperature, anatomic variation, and expertise in palpating peripheral pulses may contribute to variation in the clinical examination. Absence of pulses remains a significant clinical finding. Absent posterior tibial, popliteal, or femoral pulses with or without bruits that persist on repeated examination are clinically significant and indicate significant occlusive LEAD whether intermittent claudication is present or not. Angiography remains the gold standard for identifying occlusive LEAD and the areas of occlusion in the arterial system. Patients being considered for amputation because of occlusive LEAD should have angiography performed to determine whether revascularization may be effective in salvaging the limb or in lowering the level of amputation

CASE REPORT

A female patient of 88 years was reported in surgery department with a chief complaints of wound over the right toe since 20 days, patient was apparently normal one month back and then had a history of trauma over the toe and developed a wound over right fourth toe but there was no history of pus discharge, fever. The wound was initially started at the tip of the toe and gradually progressed to the base, patient presented difficulty in walking especially in the morning, and Pain was more over the wound pricking. The patient had a history of diabetes mellitus since 3 years and on regular treatment with metformin (500mg) + glimepiride (2mg). This patient has a habit of chewing tobacco since 20 years on 3 times a day. She has attained menopause 40 years back, the empirical antibiotic therapy like amoxicillin + clavulanic acid, metronidazole were started, but it was not much effective for the patient and hence in addition to the empirical antibiotic therapy she was also treated with anti-platelets as the case seems to be PAD (peripheral artery disease) since the patient was diagnosed with dry gangrene to the right fourth toe, amputation suggested to be the best treatment and the toe was amputated. Duplex Doppler study was advised to the patient and the impression reported that Mild atherosclerotic changes of arterial system in both lower

limbs more on right side, decreased flow velocity in the right leg. Regular grafting and dressing of the wound helped to reduce the spread of the infection. From the second week after the amputation of right leg fourth toe the patient was also treated analgesics and multi-vitamins. The diabetic gangrene, healing of the wound takes more time it can be made easier by the use of special techniques like hyperbaric oxygen therapy and skin grafting.



Fig. 1: After The Amputation of Right Toe.

DISCUSSION

Gangrene is defined as focal or extensive necrosis of the skin and underlying tissue. However, this definition presents difficulties. There are several etiologies for gangrene, as there are for foot ulcers. One is LEAD of the large or small vessels, but infection and neuropathy may also play a role. Gangrene is better correlated with LEAD than is foot ulcer. The dry gangrene shows decreased blood supply to infected tissue and skin appears shiny, black or brown discoloration of the skin.

In this study we note that due to decreased blood velocity or flow, biological environmental factors that may promote the tissue necrosis, and chewing the tobacco a major risk factor for the spread of the infection and hyperglycemia condition is also seen. In this case the primary goal was to decrease the spread of infection and achieved by amputation, grafting procedures along with the medical management. The PAD was treated by the administration of vasodilators, anti-platelets like cilastazole (100mg, taken orally, twice daily).

The result obtained from this study ensure that the treatment followed like Amoxicillin + clavulanic acid and metronidazole along with some analgesics (Aceclofenac, tramadol) and anti-platelets like cilastazole for 2 weeks reduced the infection spread and may not lead to the further complications.

CONCLUSION

In this study we conclude that the amputation, grafting and the antibiotic therapy used for the treatment of diabetic gangrene had a major role to heal the wound and reduce the infection spread, anti-platelets were effective to promote the blood supply to the tissue and reduce

peripheral artery disease. The result shown that the entire wound get healed by the combination of anti-biotics along with anti-platelets and regular dressing of the wound, by avoiding the tobacco chewing a major risk factor and the patient was cured by this treatment which was conducted in our tertiary care hospital.

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