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Calcific Uremic Arteriolopathy (Calciphylaxis) Dermatological Case

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Abstract: ***Introduction: Calciphylaxis, also known as calcific uraemic arteriolopathy (CUA), is a rare condition characterized by exquisitely painful necrotic ulcerations in patients with end-stage renal disease (ESRD) undergoing dialysis. Calcific uraemic arteriolopathy can be characterized by obstructive vasculopathy, with calcification of small arteries and arterioles resulting in luminal occlusion and subsequently cutaneous necrosis [1]. The incidence of CUA is estimated to be approximately 1% in patients with CKD and 4% in patients on dialysis [2]. The disease is rare but devastating, increasing in dialysis population [3] and its aetiology is still unmasked that is challenging demonstrates a challenge for different specialities. Even if diagnosed in early stages, the mortality rate remains exceptionally High and the success in healing is low. [4] Mortality rates are estimated at 60-80% [5]Furthermore, the disease is characterized by skin ulceration that undergo necrosis leading to intense pain and can be localized on any part of the skin. Objective: To raise awareness of Calciphylaxis in hopes of prompting earlier recognition with improved clinical outcomes. It is a rare complication but a fatal event of chronic kidney disease.***

1. Case Presentation

A 62-year old obese married female resident of sun city came to causality with a past medical history significant for chronic renal disease since 10 years and was on haemodialysis three times a week, since 1and half year,. A known case of Type 2 Diabetes Mellitus on insulin therapy since 8years, hypertension and Chronic Venous Insufficiency since 2years, she was admitted in the medical ICU for Grade 4 dyspnoea on 07-12-2021at 12.35pm. Upon admission, the patient was drowsy, responding to painful stimuli, In severe distress, was maintaining spo2 to73%, with high flow oxygen therapy. As noted to have painful, necrotic ulcers on the left upper limb, Dermatology referral was given. There was no history of loss of appetite, nausea, vomiting, constipation, abdominal pain, fatigue, weakness, muscle pain. Confusion, Disorientation was present. . There was no history of indigenous drug intake, calcium or vitamin D supplementation in the past. The patient attenders denied the history of consuming alcohol or smoking and did not give any history suggestive of a connective tissue disease. On General examination, our patient was obese [BMI 48], well built and well nourished in a semi-conscious state had no fever but, tachycardia, pallor and cool extremities present. Cyanosis of left hand is seen, no icterus, clubbing and firm, Solitary 0.5cm left axillary lymphadenopathy present. VITALS: The patient was unconscious, afebrile with blood pressure 60/40 right upper limb supine position, pulse rate 110/min, respiratory rate of 24/min, oxygen saturation 73% with high flow of oxygen. GRBS was fluctuating from363 to231mg/dl as on iv insulin infusion. Bilateral Pedal oedema present.

1.1 Dermatological Examination

The patient had a 10.5 x 5.0 cm painful black irregular thick necrotic eschar surrounded by tender violaceous border on the left forearm. There were multiple indurated plaques with retiform purpura and flaccid haemorrhagic bullae on the left upper extremities and a few flaccid bullae on the left thigh with prominent retiform purpura bilaterally.

1.2 Investigations

It revealed WBC count of 19, 000/cu. mm; [neutrophilic leukocytosis blood sugar levels at 462mg/dl; serum creatinine: 8.5mg/dl; Blood urea: 218mg/dl; Alkaline phosphatase: 212u/l; Serum albumin: 2.5g/dl; Plasma levels of calcium phosphate Blood culture, SKIN biopsy and X-RAY Reports awaited.

2. Results

A Clinical diagnosis of Calciphylaxis was made and patient was prepared for immediate wound care and pain management. The patient went into a sudden cardiac arrest within 12 hours of admission and expired On 8-12-2021 at 3.45am Due to septic shock and diabetic keto acidosis.

3. Conclusion

Calciphylaxis carries a poor prognosis; if untreated, the skin lesions may fail to heal, leading to sepsis and death.

4. Discussion

Calciphylaxis is a critical condition of progressive cutaneous necrosis caused by small vessel calcification and carries a high mortality.

5. Risk Factors

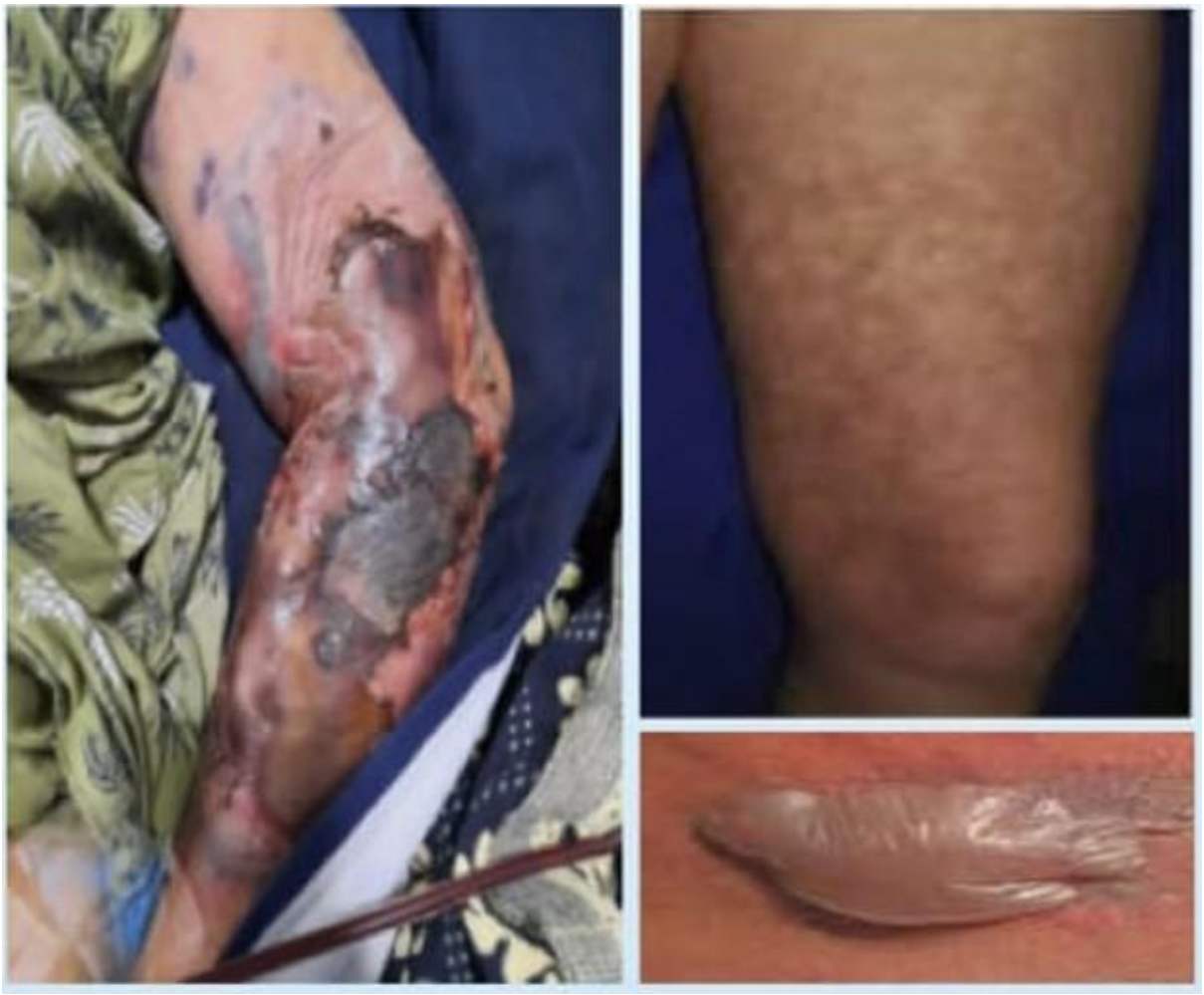
ESRD, post transplant patients; Obesity; Diabetes; Caucasian race; Female sex; Hypoalbuminemia; Warfarin therapy. impaired calcium and phosphorus metabolism, prolonged dialysis. [8] The primary event is occlusion of the small blood vessels in the skin by a thrombus (blood clot), which results in spreading ischaemia and skin necrosis.

Clinically, highly painful, purpuric skin lesions in the form of plaques or nodules, often with a reticulated pattern (retiform purpura); flaccid haemorrhagic bullae; ulcers; or frank gangrene are noted. The antecedent cause of death being sepsis further corroborating the clinical diagnosis. Although the disease pathogenesis remains unmasked, abnormal calcium and phosphorous metabolism, [7, 8]inflammation] and the occurrence of a hypercoagulable state [7] have been seen and could result in vascular and extravascular calcification.

The process of Calciphylaxis approach requires recognition of two main steps: [11]

1) Calcification of medial wall and intimal fibrosis of the arterioles.
2) Thrombotic occlusion resulting from progressive calcification and endothelial dysfunction. Vascular calcifications result due to dysfunction of the regulatory mechanisms that manage calcium, phosphate, and parathyroid hormone (PTH) levels.

Dystrophic vascular calcification can either involve the tunica media or intima, along with or secondary to the formation of atherosclerotic plaques resulting in calcium hydroxyapatite and matrix vesicles deposition within the vessel walls. [12]. The primary presentation of the disease is in form of symptomatic cutaneous painful lesions. On examination, these lesions initially present as serpiginous, tender, palpable subcutaneous masses later on progressing to non healing ulcers. [10]. The lesions in Calciphylaxis are painful and may be sometimes secondarily infected involving adipose rich sites of the trunk and lower extremities. These lesions appear as an indurated plaques overlaid by livedo racemose that may progress to non healing, black stellate shaped ulcers. The typical net like pattern of lesions is due to the cutaneous vasculature consisting of central arterioles running perpendicularly from vessels in the fascia. The resulting cyanosis due to accumulation of deoxygenated blood at the junctional areas between these blood vessels lead to the classic net like lesional configuration. [13]]Clinical imaging, chief among these plain X rays and 3phase nuclear bone scans are important diagnostic tools. [14] Liver function test (LFT) including alkaline phosphatase, serum transaminase, and albumin. Patient's complete blood count (CBC) with differential count and blood cultures can be performed in order to rule out any infection. Coagulation profile of the patients can be monitored by prothrombin time (PT), international normalized ratio (INR), and partial thromboplastin time (PTT). Hyper coagulation evaluation can be done by estimating protein C, S, antithrombin III and anti phospholipid antibody levels. Inflammation evaluation including, serum C reactive protein (CRP) and albumin. Finally, evaluation of presence of autoimmune diseases and malignancy. [15]



Best way to confirm Calciphylaxis requires biopsy of involved area of skin and the test should be preformed whenever the diagnosis is considered.

Inference: Calciphylaxis carries a poor prognosis; if untreated, the skin lesions may fail to heal, leading to sepsis and death. Facing the still deleterious outcome of patients with Calciphylaxis, further studies on prophylaxis as well as treatment are urgently needed.

6. Prevention and Treatment

Treatment of Calciphylaxis requires a multidisciplinary approach involving nephrologists, dermatologists, plastic surgeons, dietitians, and wound care specialists. [16]

Considering the debilitating and lethal nature of Calciphylaxis, however, the lack of robust data should not dissuade the adoption of treatment options after a frank discussion with the patient about the risks, benefits, and limitations of each treatment option [17]

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Patients attenders have given consent for taking photographs

Conflicts of Interest: None

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