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Warfarin Induced Tissue Necrosis and its Management

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Abstract

Warfarin-Induced Skin Necrosis (WISN) is severe complication of oral anticoagulant therapy. Incidence is 0.01 to 0.1 percent of Warfarin-treated patients. Other cause hereditarydeficiency of protein C. patients with rapid loading of Warfarin and thrombophilic diseases is at high risk. Early recognition and prompt intervention of the condition is very important as anticoagulation is being used for major illness. Various theories of pathogenesis have been described. Skin necrosis represents as acomplicated and recalcitrant to conservative treatment. Since patient is not hemodynamically stable major surgery also cannot be done. Hence the condition remains a major diagnostic and therapeutic challenge for surgeon. We present a severe case of WISN of bilateral thigh which was managed with a minimal invasive bed side under local anesthesia by External Tissue Expansion Wound Contraction (ETEWC) and wound healed completely in short period of time.

Keywords: Warfarin; Skin Necrosis; ETEWC.

Introduction

Coumadin (Warfarin) was first introduced (Bristol-Myers Squibb, New York, NY) in 1941.

Warfarin is used to prevent thrombosis and thromboembolism and it is one of the most commonly prescribed oral anticoagulant. It has several complications and interactions. Alteration of coagulation profile is one of the serious complications of this therapy. Regular monitoring of coagulation profile is especially INR is important. High INR indicates increased risk of bleeding while low INR indicates insufficient Warfarin dose so the drug has to be kept in the effective and safe range to avoid complications.

Among other serious complications skin necrosis is most severe condition. Affected patient is characteristically middle-aged, obese, premenopausal with history of treatment for deep vein thrombosis, pulmonary embolism, and coronary or cerebrovascular thrombosis.Sited with high amount of fat are affected more for example breast, abdomen, buttock or thigh etc. commonly occurs in unilateral with multiple lesions, may also present bilaterally. Skin changes may appear from first to tenth day of starting the treatment but most commonly it occurs on three to six days after starting Warfarin [1, 2, 3].

Methodology

A 25 year old lady, a known case of Idiopathic Thrombocytopenic Purpura, was on oral prednisolone. Patient responded initially but subsequently enveloped recurrent bleeding with low platelet count she was planned for Splenectomy in surgical gastroenterology department. Postoperatively she developed Left femoral DVT, and was started on anticoagulation initially with Low molecular weight heparin (LMWH), simultaneously patient was started on Warfarin and LMWH was discontinued after 3 days of starting Warfarin. Patient developed cutaneous necrosis on posterior aspect of left thigh on 5th days of starting warfarin. Warfarin was stopped immediately and patient was again started on LMWH. Patient was referred to plastic surgery department for management of the wounds. Both patient and wound were examined systematically.

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On examination two wound were found over post aspect of left thigh. Upper wound was of size 15x6 and lower wound was of size 5x3cm. Both wounds were covered with thick and adherent black eschar. Surrounding skin was found to be indurated and unhealthy. Both wounds were found to be deep up to subcutaneous tissue with underlying slough and foul smelling discharge was noticed. Patient's was not fit for major surgical procedure under anesthesia. The patient was put on External Tissue Expansion Wound Closure (ETEWC)using rubber band and hooks under local anesthesia after bed side surgical wound debridement and irrigation with saline and silver solution. Hooks were fixed with the skin of wound margin with the help of non-absorbable sutures in such a way that tip of the hook was facing towards the centre of the wound (Fig. 1).

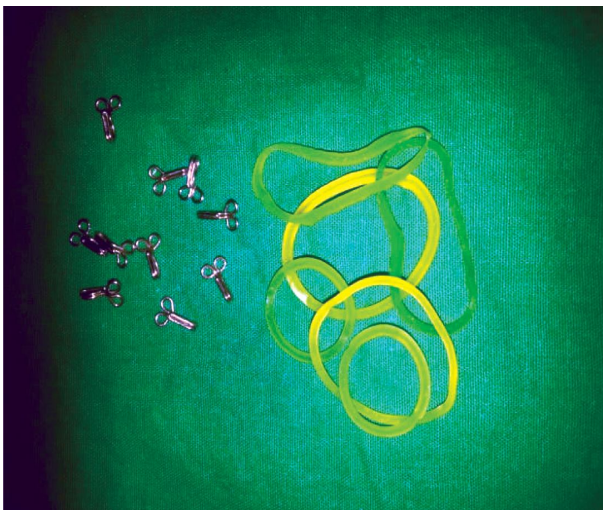

Fig. 1: Hooks and rubber band used for ETEWC

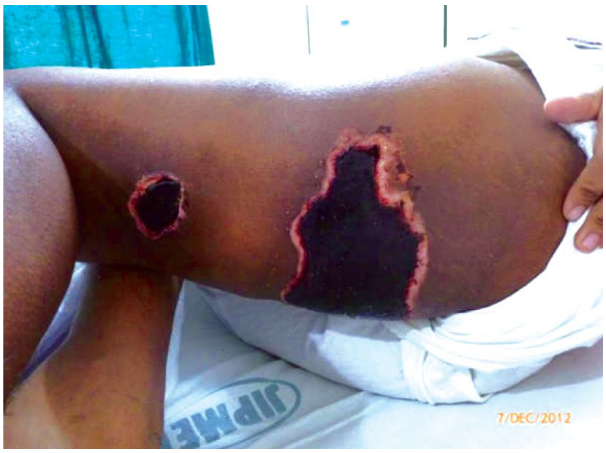

Fig. 2: Wound, before debridement

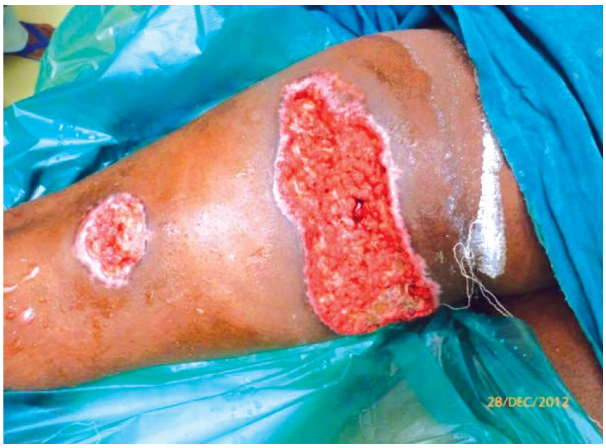

Fig. 3: Wound after debridement

After application of hooks over both the wounds the cavity was filled with collagen granules and collagen sheet. Rubber bands were applied over the hooks to exert a centripetal traction effect over the wound edge towards the centre. Wound was dressed with sterile dressing. Dressing was changed every 5th to 6th day or if soaked. With each dressing centripetal traction was increased to facilitate wound closure till wound got completely healed.

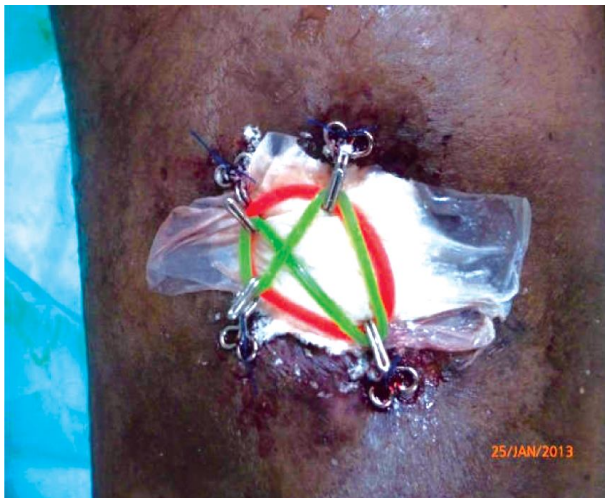

Fig. 4: Hooks applied over lower wound

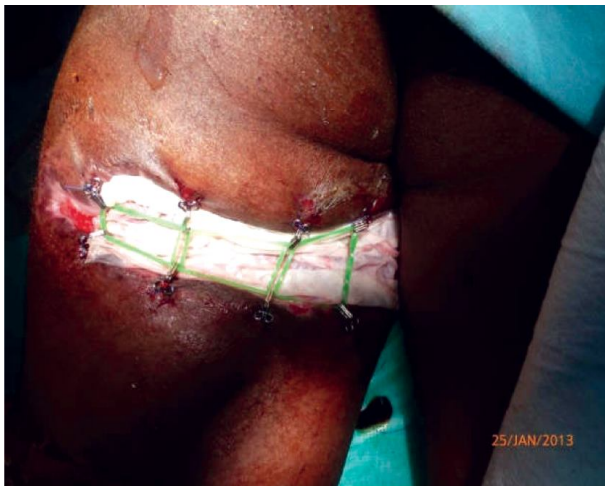

Fig. 5: Hooks applied over upper wound

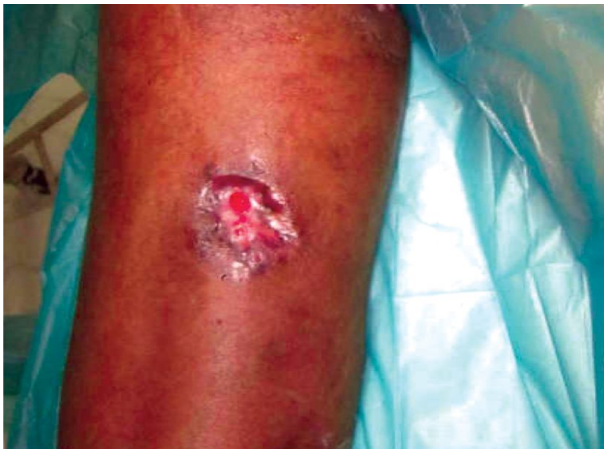

Fig. 6: Lower wound after 3 weeks

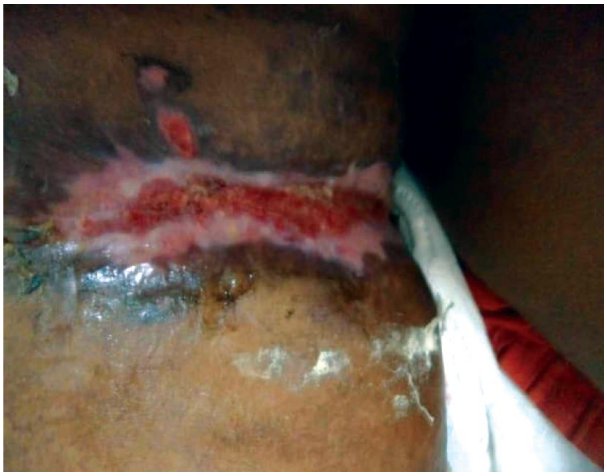

Fig. 7: Upper wound after 3 weeks

Results

We found external tissue expansion wound closure (ETEWC) system with as an effective and safe method for wound closure in managing such kind of complex and recalcitrant ulcer with systemic illness in which major surgical reconstructive procedure is contraindicated.

Discussion

Warfarin induced skin necrosis is a dreaded complication of Warfarin therapy. Understanding of coagulation cascade is necessary for its mechanism (Fig. 8)

Various coagulation factor have different half-lives, because of this reason Warfarin inhibits different factors in a different way. Warfarin inhibits protein C and Factor VII in a stronger way than inhibition of the other coagulation factors II, IX and X. The resulting imbalance of coagulation factors leads to

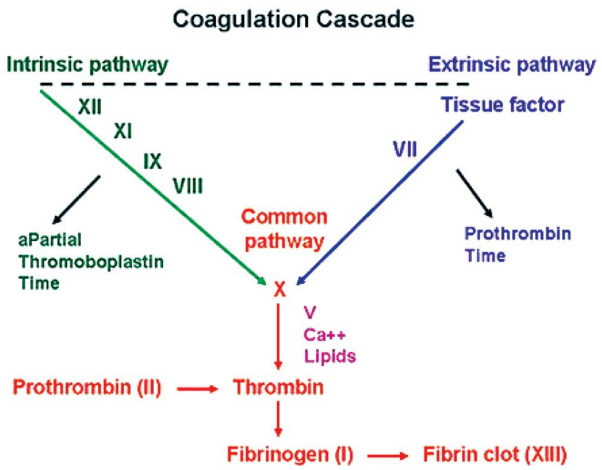

Fig. 8: Coagulation cascade

paradoxical activation of coagulation, which cause hypercoagulable state and thrombosis. As a result of thrombosis the blood supply to the skin is interrupted, causing necrosis. Protein C is a natural anticoagulant present in the body and warfarin further decreases protein C levels, which leads to massive thrombosis with necrosis and even gangrene of limbs. The prothrombin time (or international normalized ratio, INR) used to monitor the effect of caumadin [4]. Warfarin necrosis commonly occurs in patients with an underlying, coagulation disorders or deficiency of protein C, protein S etc., [5, 6]. Other factors are activated protein C resistance and antithrombin III deficiency [7, 8]. The disease follow a characteristic pattern in the sequence of paresthesias, pressure sensation , extreme pain, erythematous flush , petechiae development, hemorrhagic bullae and finally full-blown necrotic eschar which may require extensive surgical debridement [9, 10].

Several theories have been suggested related to Warfarin induced necrosis. According to Nalbadian and colleagues warfarin causes toxic vasculitis. Damaged capillaries dilate and rupture, and petechiae develop quickly. Veins distal to the injured capillaries thrombose, creating stasis of blood and tissue necrosis. Another proposed theory is Protein C and Protein S deficiencies and inadequate Antithrombin III [11]. Early diagnosis of impending Coumadin-inducedskin necrosis is necessary and necessarymeasures can significantly alter the course and improve the prognosis [12].

Conclusion

Warfarin induced skin necrosis is a dreaded complication of oral anticoagulant therapy. Often the

wound is deep and contains greater amount of necrotic tissue. Patientusually remains unfit for major reconstructive surgery due to disturbed coagulation parameters and risk of bleeding. We managed similar condition with ETEWC, which can be considered as an alternate measure in such condition.

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