

Soft silicone wound contact dressing complements the application of platelet rich plasma in chronic wound management

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Introduction

Chronic wounds have underlying causes that must be addressed in order for the wound to heal properly. They have been defined as wounds, which have failed to heal in a normal sequence of wound repair and produce persistent inflammation and healing is stagnated due to elevated levels of pro-inflammatory cytokines, proteases and neutrophils and do not completely heal after 30 days of standard medical treatment (Lau et al (2005)).

Growth factors are essential part of the body's healing process. Since platelets found in blood are a very rich source of growth factors, scientists have worked at utilising platelets from a patient's own blood by isolating, concentrating and activating the platelets to increase the growth factor count four fold. In addition useful white cells are also included to assist healing further by reducing inflammation and fighting infection; this is known as Platelet Rich Plasma. Because PRP is an autogenously preparation it is inherently safe and free from concerns over transmissible diseases.

Method

This case study focuses in on the use of Silflex® soft silicone wound contact layer to hold Platelet-Rich Plasma (PRP) gel in place on a wound allowing excess exudate through the holes, to prevent maceration to the peri-wound whilst maintaining the concentration of the platelet gel. Frykberg et al, (2010) reported the difficulty in handling and applying, and ability to fix the gel on vertical and inverted wound surfaces.

At the Bupa Cromwell Hospital we have been treating chronic non healing wounds with PRP gel for the last 5 years, produced using Angel (whole Blood Separation) centrifugation cytomedix, Rockville USA. PRP is similar to the natural healing process with multiple growth factors, produced from the patients own blood. Whole blood, 60mls, is drawn from the patient using aseptic technique and processed via centrifuged to separate the plasma from packed red blood cells and then further centrifuged to separate PRP from Platelet-Poor Plasma. This concentrate is then activated with the ascorbic acid and then mixed with calcified thrombin to activate the platelets to form a gel containing a fibrin matrix. (Leon et al, 2011) Autologous PRP gel is applied topically over the wound just as the gel starts to form on the wound bed. It is important to retain the fibrin matrix gel on the wound, allow excess exudate to pass through the dressing but also maintain a moist wound bed. Silflex® soft silicone contact layer was placed below the wound and gently manipulated over the wound to contain the gel on the wound bed.

References

Leon J, et al (2011) The Clinical Relevance treating Chronic Wounds with an Enhanced Near - Physiological Concentration of Platelet-Rich Plasma Gel Advances in Skin & Wound Care, (24) 8: 357-268 electronically distributed by Cytomedix permission granted from Advances in Skin & Wound Care.
Lau et al (2005) Usual care in the management of chronic wounds: A review of the recent literature, Agency for Healthcare Research and Quality Technology assessment program.
Frykberg et al (2010) Chronic wounds treated with a physiologically relevant concentration of platelet-rich plasma: a prospective case series.

Case study 1

Mr K age 50 from Kuwait has diabetes Type 2 and has been on insulin for 10 years. He had a forefoot amputation 5 years ago for neuropathic foot ulcers with osteomyelitis. He returned to London following a cardiac event in which his foot was badly damaged. He was reviewed by the vascular surgeon and amputation was recommended as the foot was very damaged and did not appear to be salvageable. The foot was heavily colonised with Pseudomonas and Staph aureus. He was reviewed by the cardiologist prior to arranging amputation and his cardiac function was very complex with severe



On admission

both left and right ventricular impairment. He was medically unfit for general anaesthetic for either cardiac revascularisation for ischemic heart disease or below knee amputation. NWPT Renays Go was applied with Amd gauze to reduce bio burden and control exudate management. After a period of 3 months after removing pieces of loose bone, the forefoot was showing signs of healthy tissue. The management strategy changed to salvaging of the forefoot and reducing bio burden rather than below knee amputation as his cardiac function had improved to enable surgery to proceed for the cardiac revascularisation. PRP was initiated when the wound shows sign of stagnation to restart the inflammatory phase of healing. It was applied on weekly basis for 2 months. The wound continued to heal and has just closed.



Silflex® in use



Fluid passing through dressing



Silflex® and Platelet gel



Healed wound

Case study 2

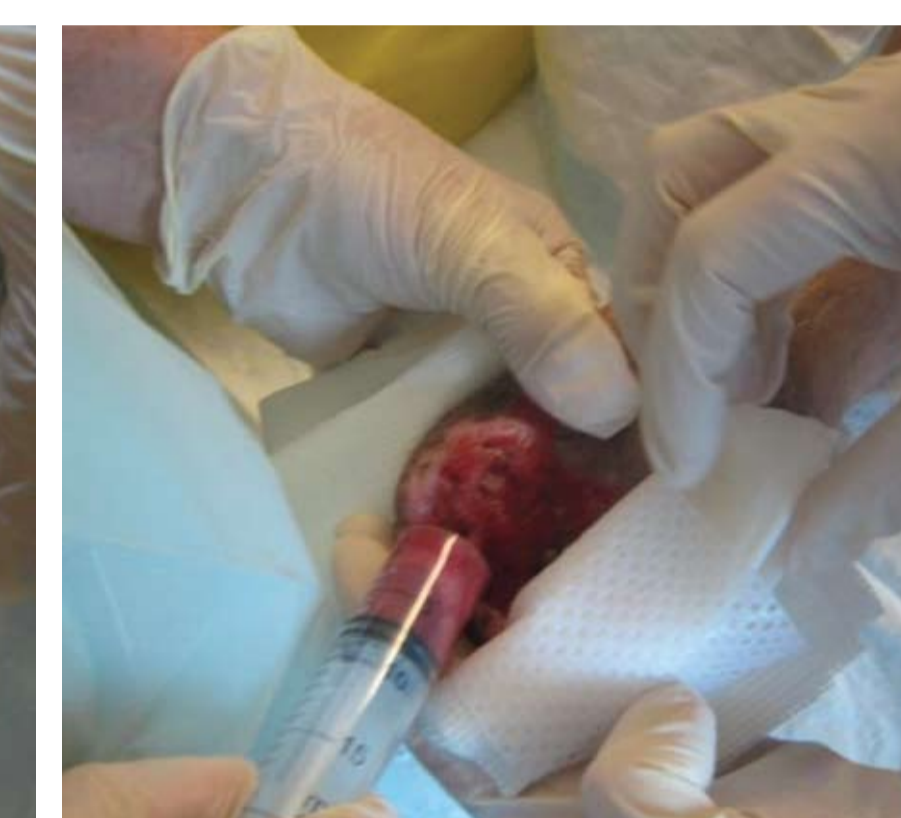
Mr Al K from Kuwait aged 65, was diabetic with peripheral vascular disease with history of a stroke, was admitted with wet gangrene of left toes. Revascularisation with stent to left leg was tried to improve blood supply followed by amputation of gangrene toes. IV antibiotics and PRP was applied weekly with Silflex® dressing to contain the fibrin matrix gel in place on the wound bed.



On admission



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Discussion/ Results

Various dressings have been used to retain the PRP gel but due to the silicone mesh of previous dressings being very tacky it can cause the dressing to stick to the gloves and could potentially risk removing the dressing and displacing the gel. The Silflex® soft silicone wound contact layer is easier to handle, which makes the delivery of the PRP gel easier. The larger holes in the dressing allowed the excess exudate to pass and prevent maceration of the peri-wound.



Silflex® and Platelet gel



Healed wound

Conclusion

These case studies highlight that the application of PRP gel restarts the healing process in complex non-healing wounds and provides rapid and consistent improvement in healing chronic wounds. The soft but conformability and high tensile strength of the dressing on application ensures platelet gel remains in place on the wound bed.