

Managing deep vein insufficiency and leg ulceration using strong compression

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Introduction: Lower limb wounds (LLW) represent 28% of all wound types, with venous leg ulcer (VLU) prevalence contributing to 15% of this number (Guest et al 2020). Guest et al (2020) estimate over 1 million patients with a LLW were managed by the National Health Service (NHS) England between 2017 and 2018, representing 2.0% of the adult population. Compression therapy is a key treatment for Deep Vein Insufficiency (DVI), with higher levels of compression often recommended for more severe cases. The optimal compression level should be tailored to an individual's specific condition and needs. This poster will explore the assessment, compression selection and management of a leg ulcer with a patient diagnosed with DVI.

Method: This case study details a 74-year-old female (Mrs E) who had a left medial malleolus (retro-malleolar) ulceration for 8 years (Fig 1), despite being treated with full therapeutic compression bandages. Past medical history included deep vein thrombosis (DVT), additionally, they had undergone endovenous surgery in the past. As part of their ongoing care, the patient's ankle-brachial pressure index (ABPI) was measured annually. These measurements had consistently shown a value of 1.1, indicating stable peripheral circulation over time. Previous treatment has involved the multi-disciplinary team (MDT) including dermatology, vascular and tissue viability services. A differential diagnosis of DVI without arterial involvement was originally made by the vascular department, with an updated venous duplex completed 6 years later. This showed disease in the deep venous system alongside the superficial femoral, popliteal, posterior and peroneal veins being patent, but incompetent. Due to the position of the ulcer, incompetent superficial and deep veins and non-healing despite strong compression bandages, a decision was made to use firmer compression to penetrate the deeper vessels. A custom made to measure flat knit RAL Class 3 hosiery garment was chosen to enhance the foot and calf pumps and improve venous return through an increased static and dynamic stiffness index. This also enabled the patient to wear appropriate shoes supporting the importance and improvement of mobility and gait. Improvement was noted very quickly, however wound healing then stalled and a decision to use an additional compression garment over the hosiery was made to increase compression levels. As compression levels would be elevated, soft orthopaedic padding was used along the tibial crest to prevent pressure damage, as this was very prominent.

Discussion: In some cases, higher levels of compression may be beneficial for recalcitrant ulcers and can help overcome the elevated venous pressures in deep venous insufficiency. A study on recalcitrant leg ulcers found that using strong compression pressures of 40-60 mmHg led to healing in many previously non-healing ulcers (Shi et al 2021). However, higher levels of compression should only be used under close medical supervision, following careful assessment of arterial circulation before applying high compression. Other ways to generate safe and tolerable compression is utilising different materials, with varying effects on intermittent pressure peaks. The key factors that influence these pressure peaks are the stiffness and elasticity of the materials used (Vowden, Kerr & Mosti 2020). Stiff, non-yielding materials produce higher intermittent pressure peaks compared to elastic, yielding materials. This is particularly noticeable when the calf muscles contract during movement. The static stiffness index (SSI) and dynamic stiffness index (DSI) are important parameters used to help characterise compression-therapy effectiveness. The static stiffness index is defined as the difference between the pressure measured in the standing position and the pressure measured in the supine (resting) position. A higher SSI indicates that the compression device is more effective at reducing venous reflux and exerting a massaging effect to improve venous pumping function during movement. The DSI helps further understand the effect of compression and is a measure of the stiffness of compression devices under dynamic conditions, such as standing, walking and movement (Vowden, Kerr & Mosti 2020).

Results: An adjustable compression wrap system (ReadyWrap) was chosen due to its efficacy in managing venous leg ulcers, its ease of use and its ability to promote self-care and independence (Hallas-Hoyes et al 2021). The adjustable wrap was applied at a comfortable stretch and the patient was able to gauge the pressures which were tolerable. The wound management protocol incorporated a multi-layered dressing approach. A cadexomer iodine dressing was selected as the primary dressing due to its antimicrobial properties and ability to promote healing. To protect the wound bed and prevent adherence, a non-adherent wound contact layer was applied alongside a superabsorbent dressing to manage exudate effectively, maintain an optimal healing environment, and reduce the frequency of dressing changes. Initially, patient care was scheduled twice weekly, then reduced to once weekly as exudate levels decreased. Notable improvements in the patient's condition included enhanced mobility and gait. The patient progressed to wearing their chosen footwear, replacing the previously necessary bandage shoe. This advancement contributed to increased confidence in self-care practices. A significant milestone in the patient's recovery journey was reached when she became capable of independently managing personal hygiene, including showering. This newfound autonomy not only boosted her self-reliance but also prepared her for maintaining her healed status in the long term. The patient was educated on the importance of consistently wearing appropriate compression hosiery to prevent potential regression of her condition. This empowerment strategy equipped the patient with the knowledge and tools necessary for sustaining her improved health status independently. After enduring chronic ulceration for 8 years, the patient's wound achieved complete healing within 17 months of initiating treatment (Fig 7).

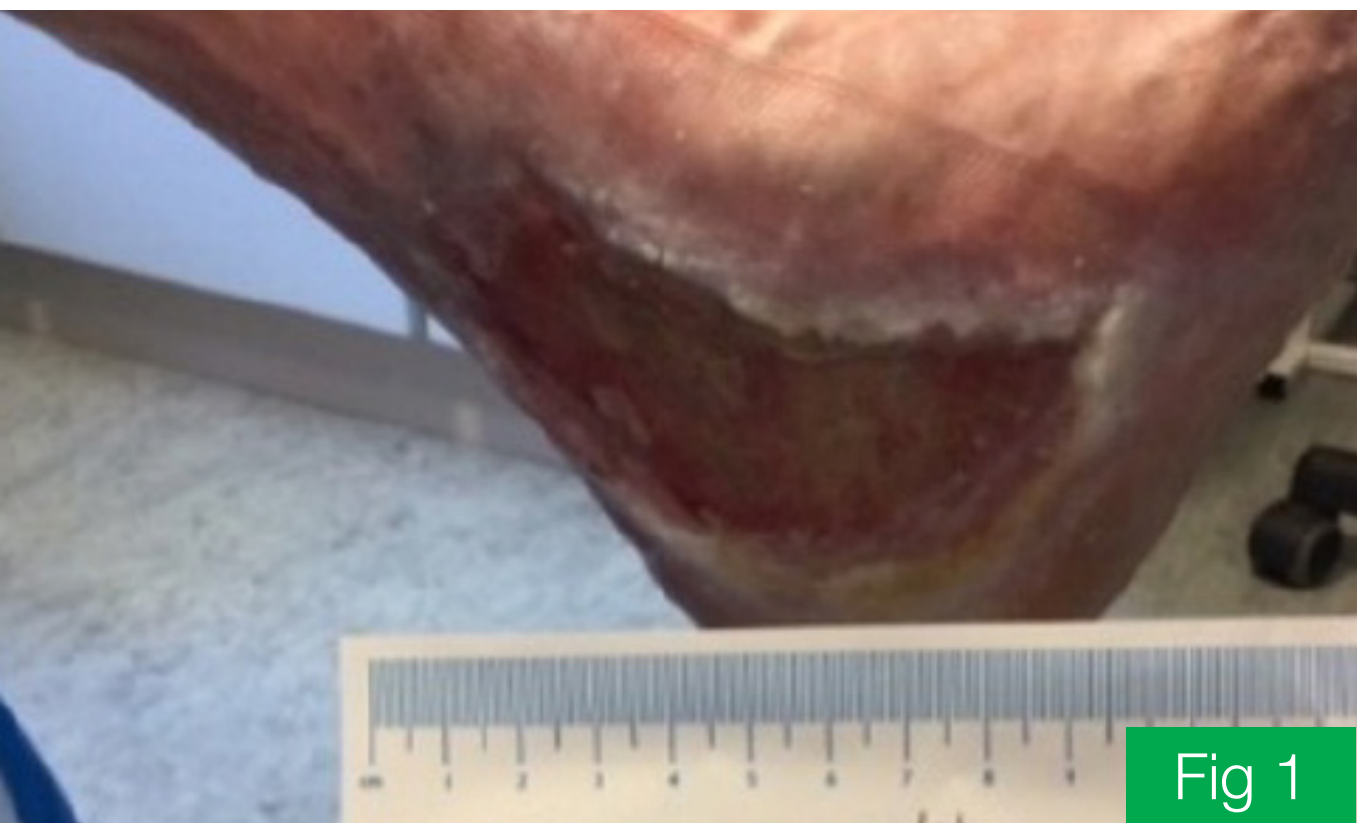


Fig 1



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7

Conclusion: This case study demonstrates the effectiveness of ReadyWrap in treating chronic venous leg ulcers. The 74-year-old patient had suffered from a left medial malleolus ulceration for 8 years before being introduced to ReadyWrap. The system's ease of use and ability to promote self-care were key factors in its selection. The adjustable design provided comfortable, strong, targeted compression, which she could easily manage independently. The results were remarkable, enhanced mobility and gait and complete wound healing within 17 months. This case highlights the potential of ReadyWrap in treating long-standing venous leg ulcers and improving patients' quality of life.



References:

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