

Technological Advancements in the Management of Hypertrophic Scars with Silicone and Pressure Therapy

Debra Wright, Research and Development Manager, Jobskin Ltd, Nottingham UK



Acknowledgements

- Djody van Swaal, Mum and Physiotherapist. Special thanks for allowing me to work with your daughter and documenting a very sensitive and personal experience.
- Jon Niszcak, Therapy Specialist, Bio-Med Sciences USA, for your advice and support with the poster.
- Lydia Dean, OT Therapy Specialist. Joint patient therapy reviews for splints.

Introduction

Pressure garments have been widely used since the 1970's and remain the standard therapy and first line treatment in many centres. The evidence gathered through international research shows that the early application of pressure therapy garments with the correct wearing regime is successful in helping to control the growth of abnormal scar tissue in problem scarring. Jobskin® are committed to on going research and technological advancement and supports evidence based practice. If you would like to share your ideas or participate in research/clinical evidence audit studies please contact: dw@jobskin.co.uk or call on 01971 447073

Development of compression therapy garments

'Providing choices to empower the patient and aid compliance'

Basic construction and fabric has not changed since the 1970's, however advancements in fabric colour dye types, thread choice and the addition of motifs and trimmings have modernised garments and enhanced patient compliance by embracing manufacturing technological advancements with individual styles and preference choices. Manufacturers, predominantly Jobskin have noted the need to offer the patient a wider range of design choices, colours, transfers and trims to support compliance. [4,6,8]

Innovations in Silicone gel

'A Silicone bonded textile for customisation to pressure garments'

There are numerous 'stand-alone' silicone products available for use but only Silon-TEX® offers the combination of silicone and pressure in one comprehensive treatment. Developed using Silon® technology via an Interpenetrating Polymer Network, this patented combination provides a durable internal reinforcing mechanism within a very thin and soft silicone membrane. Silon-TEX® can be sewn directly into Jobskin made to measure garments in specific areas.

Demographics

It is estimated that 100 million people worldwide each year acquire scars following trauma and post-surgical procedures. Over half a million children are hospitalised with burn injuries, with a quarter to a half of all burn injuries attending a burn center for treatment. The majority of paediatric burns occur in the home environment and are scalds from hot water and other liquids and burns from household appliances, faulty appliances or cooking accidents. [1]

Method: Single Paediatric Case Study

Nine month of age, accidental hot water scald to the lower extremities, abdomen, arms and hands following an accidental hot water scald. Cleo was sitting in the kitchen sink and pulled open the tap, hot water ran from the kitchen counter into the sink. Cleo admitted to A&E in Holland on the 24/6/14 with 23% deep dermal burns to legs, and feet. Minor burns to arms, hands and abdomen. Deep wounds on the left leg necrotic, decision made to split skin graft from skin harvested from upper right leg. Cleo was seen in the UK for private scar management.

Jobskin® For further information on Jobskin® MTM Pressure Garments and Silon-TEX® please contact:
Debra Wright, Jobskin Ltd, dw@jobskin.co.uk or
Unit 13a Harrington Mill, Leopold Street, Long Eaton, Nottingham
NG10 4QG
t: +44 (0) 115 973 4300 | e: orders@jobskin.co.uk www.jobskin.co.uk



Post-op therapy intervention

Massage and soft tissue mobilisation:

Applied to minimise soft tissue shortening, adhesions and maintain ROM. Post-operative swelling present in the foot and sole of the foot reducing full contact with the floor while learning to walk and stand for short periods, daily therapy has reduced oedema and increased ROM.

Pressure garments:

Applied as soon as the wounds healed and pressure was able to be tolerated. A Jobskin Premium MTM gradient pressure garment was designed and provided. Due to Cleo's growth rate, regular garment reviews and re measures were indicated.

Silicone gel:

Combination therapy was indicated due to extensive widespread hypertrophic scarring. Silicone gel was topically applied in the initial stages then changed to silicone coated textile (Silon-TEX®) sewn into the garment to assist daily treatment regime and remove the need to cover large areas of scarring with topical gel before applying/re applying the pressure garment.

Thermoplastic splinting:

To provide prolonged stretch at rest to the ankle and forefoot to minimise the effects of scar tissue shortening on ROM. A second splint was introduced to support the metatarsal arch and provide prolonged stretch to the scarring on the dorsum of the metatarsal joints where shortening was causing the 4th and 5th toes to hyperextend.

Psycho / social:

Excellent support from close family and friends. Siblings have adjusted well to Cleo's scarring, helped by mums occupation and positive attitude to therapy. Professional psychological support: Mum self-referred to private therapy which she finds very helpful in adjusting to her daughter's injury and moving forward.

Clinical reasoning for pressure therapy with the addition of Silicone gel:

Due to Cleo's age and the main area of injury with high potential to scar (STSG crossing both the knee and ankle joints), the use of silicone in addition to pressure therapy and splinting was initiated to promote the most effective use of treatment modalities. Rehabilitation research to date has shown the early application of silicone and pressure is related to improvements in scar outcomes in children. [7]



Outcome results

We employed combination therapy in the form of a silicone coated textile sewn directly into the garment, removing the need to either insert large sheets of gel or apply topical gel which requires drying time. The therapy progress in this case study demonstrates that the addition of Silon-TEX® was positive compared to separate contact media in managing hypertrophic scarring with the ability to customise and address difficult areas of scarring on the leg, knee, foot and ankle joint. Overall, these results demonstrate that combination therapy with a silicone textile insert incorporated into a garment is both economically advantageous and clinically effective.

Discussion

Paediatric burn rehabilitation is both long and challenging and requires a team approach with specialists involved in burn care, working closely with the family. [1,2]

Custom made pressure garments remain the most widely used first line treatment for widespread hypertrophic scarring and recent innovation in colour fabric and trims has had a positive effect on compliance to treatment.

Silicone gel in the form of Silon-TEX® shows many advantages over other separate contact media products; sewn into a garment it provides pressure therapy that is thin, customizable and conformable. This simple, one step design provides the optimal combination with custom made garments of combining pressure and silicone therapy for the patient. Based upon these initial experiences, further utilisation of Silon-TEX® shows promise as a useful alternative to other materials commonly used and supports overall scar management compliance.

Conclusions

Advancements in both the manufacturing and technology industries have provided clinicians with unique combinations of garment materials. A custom garment with a silicone bonded textile insert accommodates the main needs of the individual patient and facilitates optimum aesthetic and functional outcomes. These advancements have also provided more durable and long lasting treatment options to manage patients' scars. Although there is a plethora of evidence to support pressure therapy and silicone gel therapy, further investigation is warranted to advance standardised treatment options to examine the impact of this combination therapy on patient compliance and scar management outcomes.

References

- Moistrey Stan, et al, Updated Scar Management Practical Guidelines: JPRAS. 2014; 67:1017-1025.
- Masume S, et al, Management of scars: Updated practical guidelines and use of silicones. Eur J Dermatol. 2014; 24(4):435-43 doi:10.1684/ejd.2014.2356.
- Mustoe TA, Evolution of Silicone Therapy and Mechanism of Action in Scar Management: Aesthetic Plastic Surgery. 2008; 32: 82-92.
- Engrav LH, Heinbach DM, Rivara FP, et al. 12-Year within wound study of the effectiveness of custom pressure garment therapy. Burns 2010; 36:975-83.
- Li-Tsang CW, Zheng YP, Lau JC. A randomized clinical trial to study the effect of silicone gel dressing and pressure therapy on post-traumatic hypertrophic scars. J Burn Care Res 2010; 31:448-57.
- MacIntyre L, Baird M. Pressure garments for use in the treatment of hypertrophic scars, a review of the problems associated with their use. Burns 2006; 32:10-5.
- Parry, I, Somen, S, Palmieri, T, Greenhalgh, D. Nonsurgical Scar Management of the Face: Does early versus late intervention affect outcome? J Burn Care Res. Sep-Oct 2013;34(5):569-75.
- Li-Tsang CWP, et al. A histological study on the effect of pressure therapy on the activities of myfibroblasts and keratinocytes in hypertrophic scar tissues after burn. Burns (2015), JBUR-4538.

Reaching for the best solutions.....