Compression therapy for paediatric lymphangiohaemangioma: Case Report

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Abstract
The following is a case report evaluating the use of the 2 layer compression bandage system: 3M™ Coban™ 2 Layer Lite Compression System for unilateral lower limb lymphoedema secondary to a congenital lymphangiohaemangioma in a twelve month old child.

Compression therapy for adults is a well recognised treatment for unilateral lymphoedema but remains less well defined for children. Treatment with an inelastic bandaging system capable of providing reduced (20-30mm Hg) pressure to the site resulted in a clinically significant improvement in the lymphoedema. A one month bandaging protocol allowed for sufficient improvement to progress to a fitted made to measure garment therapy.

Introduction
Compression therapy, whether by intermittent pneumatic compression (1) or by inelastic compression bandaging (2) for lymphoedema in adults is a well established clinical practice, both for primary and secondary lymphoedema. By comparison, treatment of paediatric lymphoedema is less well substantiated in the literature (4, 5, 6, 7). We describe a case study of a paediatric patient, treated for unilateral lower limb oedema secondary to a lymphangiohaemangioma with the 3M™ Coban™ 2 Layer Lite Compression System.

Background
In May 2012, an 11 month old baby girl was referred to our Lymphoedema Service by a Consultant Plastic Surgeon to assess progressive swelling associated with a lymphangiohaemangioma which had been present from birth. The aetiology of these lesions is unclear and the only remarkable feature of the history was a viral infection contracted by the mother during the pregnancy. Karyotyping of the lesion demonstrated no abnormalities, a finding not uncommonly observed in lesions in this area of the body (8).

On examination, the majority of the swelling was visible on the dorsum of the right foot, including the toes that were curled under the foot. The swelling extended, uniformly to mid calf and was minimal in nature compared to the forehead. The skin condition of the child was unremarkable, tissues were soft in nature and there was no history of cellulitis (Figure 1).

Figure 1. Right lower limb oedema secondary to lymphangiohaemangioma

The intervention included the use of the 2 layer 3M™ Coban™ 2 Layer Lite Compression System. This 2 layer system was applied three times a week for a month. Prior to referral, compression using an elastic bandage had been attempted without apparent effect. Additionally, as the infant was not walking initial therapy was restricted to skin care, kinesiaping and manual lymphatic drainage. This conservative treatment was implemented as not to interfere with foot and movement development.

Method
Base line circumferential measurements with the child in supine were taken of the mid dorsum of the foot and ankle prior to bandaging and each time after removal of the bandages. After the completion of the one month of bandaging a made-to-measure compression class 1, below knee garment was fitted.

After the infant was capable of walking, an inelastic bandage (3M™ Coban™ 2 Layer Lite Compression System) was applied. The bandage was applied to the leg below the knee including the foot in a toe boot application (See Figure 2) as the toes were too small to individually wrap. The patient’s own tights were placed over the bandaging to stop the child interfering with them. Also the mother was issued scissors to remove the bandaging if the patient became distressed in anyway such as crying or begging at the bandaging indicating it was causing some discomfort. Following each bandaging session the patient was observed walking independently with no changes in gait pattern compared to pre bandaging and no interest in the bandage.

Results
The graph below (Graph 1) shows the circumferential measurements of the dorsum and ankle over the course of one month treatment. The results indicate that in this single paediatric case study 3M™ Coban™ 2 Layer Lite Compression System was effective in reducing swelling and improved the shape of the affected limb with no complications (See Figure 3).

![Graph 1. Circumferential measurements of the right ankle and dorsum over the course of the treatment](image)

Figure 2. Application of bandaging

Figure 3. Right limb post : bandaging

Discussion
The problem management of this patient represented unique features. Intermittent pneumatic compression was not practical in this case and the exact compression values needed to reduce the oedema were undefined. Inelastic compression using the 3M™ Coban™ 2 Layer Lite Compression System has been shown equivalent to multi-component systems in adults (2.9) and the level of compression provided by the 3M™ Coban™ 2 Layer Lite Compression System was in the range of 20-30 mm Hg (10). However sub bandage pressure was not measured during this case study due to lack of equipment so application was cautious and the response from the child to the bandage was monitored closely for any distress or signs of discomfort. For future studies in paediatrics sub bandage pressure needs to be monitored. In addition, an ideal would be to obtain greater circumferential measurements of the affected limb but to obtain these were virtually impossible on a constantly moving child.

Conclusion
The successful reduction in circumference indicates that this bandaging system and treatment protocol were effective in reducing swelling and improved the shape of the affected limb with no complications and represents, (to our knowledge), the first such case of successful compression therapy using this approach. A critical caveat, however, is that bandaging is a skill which takes time to learn and should not be undertaken without appropriate training especially in the paediatric lymphoedema population.

References