Severe Ischemia of the Finger After Use of Compressive Self-Adherent Wrap: Report of Two Cases

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Abstract

Use of Coban compressive self-adherent wraps (3M, St Paul, MN) has been found helpful in treating various conditions and injuries of the extremities, including lymphedema, edema in burned hands, and sprains or strains. However, the availability and easy application of the wrap have resulted in its common usage with or without adequate instructions. We report two cases in which severe pain and ischemia developed after this bandage was circumferentially applied to a finger to stop bleeding from a simple laceration. One patient required amputation at the level of the proximal interphalangeal joint; the other had resolution of venous congestion symptoms after removal of the nail plate, administration of aspirin, and use of a heat lamp to facilitate vasodilation and increase blood flow. Although the wrap can be safely used when employed correctly, physicians and consumers should be aware that its misuse can have severely adverse effects.

Introduction

A Coban compressive wrap that sticks only to itself and consists of a latex-based laminate of a non-woven substance and elastic fibers (3M, St Paul, MN) has been described. Use of this bandage has been found helpful in treating chronic venous stasis ulcers of the leg and lymphedema of the extremities. Additionally, the light weight, self-adherence, resistance to slipping, and sustained compression of the wrap can result in successful treatment and promote patient comfort and mobility.

In upper-extremity applications, the compressive wrap has been shown to reduce edema in burned hands that have undergone skin grafting, which may lead to greater range of motion (ROM) and strength of the limb. Use of the bandage can also help in reducing swelling and improving early ROM in patients who have undergone flexor tendon repair. Other possible uses of the wrap include dressing and splinting for treatment of soft-tissue injuries, such as sprains or strains.

The compressive wrap is available over the counter, and its non-stick nature and easy application have resulted in common usage by both health care professionals and consumers, with or without clinician instructions. Although the product is safe when used correctly, wrapping it too tightly and leaving it in place for an extended period can have adverse effects. We describe two patients in whom a severe tourniquet effect and subsequent tissue necrosis occurred in a finger after the wrap was used incorrectly.

Case Reports

Case 1

A 24-year-old male prisoner presented to our clinic with severe pain and ischemia of the middle finger of his left hand (Figures 1A and 1B). Revascularization was not possible, and the distal aspect of his finger had sensory deficits to light touch and pinprick. He had sustained a laceration just proximal to the nail, and the wound was sutured and subsequently covered with a compressive Coban wrap in the medical facility of the prison. The wrap remained in place for several days, although the patient said he had severe pain because of the tight dressing. When the bandage was removed, ischemic changes over the distal phalanx of the finger were observed and the patient was referred to our institution.

Results of a physical examination suggested that the middle phalanx was the most distal level of the finger that was functionally viable, and the patient requested immediate amputation at that level. Intraoperatively, however, the middle phalanx was found to be necrotic, so amputation was performed at the level of the proximal interphalangeal joint.

Postoperatively, the patient initially had 1 cm² of eschar spread distally on the wound, which healed after daily dressing changes. He also had some hypersensitivity of the stump, which resolved after administering a course of gabapentin. At 4 months postoperatively, the amputation site was well healed, although with prominent scarring; the stump had good vascularization; and no hyperesthesia was observed. The patient had full ROM of the metacarpophalangeal joint.

Case 2

A 42-year-old male prisoner presented to our clinic with severe pain and ischemia of the middle finger of his left hand (Figures 1A and 1B). Revascularization was not possible, and the distal aspect of his finger had sensory deficits to light touch and pinprick. He had sustained a laceration just proximal to the nail, and the wound was sutured and subsequently covered with a compressive Coban wrap in the medical facility of the prison. The wrap remained in place for several days, although the patient said he had severe pain because of the tight dressing. When the bandage was removed, ischemic changes over the distal phalanx of the finger were observed and the patient was referred to our institution.

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Because of the venous congestion, the patient was placed under sedation in the emergency department and the nail plate was removed to facilitate venous outflow. Aspirin was administered, and the child was admitted to the hospital for observation. Her finger was placed under a heat lamp for 3 days. By day 3, the swelling had lessened considerably and the finger showed capillary refill and a digital pulse. The patient was discharged on a daily baby aspirin but no further interventions were planned.

Eight months after the injury, the wounds had healed well, although a band of scar tissue was noted at the level of the proximal phalanx (Figure 3). Additionally, the patient could not fully extend her finger because of a flexion contracture of about 45° at the proximal interphalangeal joint. She was referred to occupational therapy for scar therapy and ROM exercises.

Discussion

Use of a compressive self-adhesive Coban wrap can be helpful in treating various injuries and conditions of the extremities, but it does have some disadvantages associated with ROM impairment. Glassy and Phillips1 found that healthy volunteers whose fingers were wrapped with the material had a decrease in ROM of all joints. The authors also noted that, because maintenance of ROM may decrease edema, use of the wrap could impede resolution of edema and function. In addition, the amount of pressure increased in a linear fashion with each new layer. The authors recommended wrapping in a spiral fashion, distally to proximally or in a figure-of-eight configuration, to reduce the risk of a tourniquet effect. Additionally, the wrapped limb or finger should be closely monitored for onset of discoloration or inflammation.

Such detailed instructions and cautions for use of the Coban wrap are not included on every packaged product. Subsequently, the bandage may be applied by individuals who have not read or understood the instructions. Severe adverse effects that may necessitate amputation, although not often reported, are possible. We recommend extreme caution when using Coban wrap to treat children and other patients who cannot adequately verbalize concerns of discomfort or pain, as in the two current cases.

References