Acquired Constricting Band Syndrome

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ABSTRACT

The superstitious beliefs of gaining a good fortune led to wearing rubber bands around the hand leading to the development of the constricting band syndrome. Acute compartment syndrome is a limb-threatening condition characterized by elevated interstitial pressure in a confined fascial compartment and if left untreated, it results in tissue necrosis, irreversible nerve and muscle injury and permanent functional impairment. We report a 46 years old male with history of wearing rubber hand on all his fingers, who presented late with gangrene and auto-amputation.

KEY WORDS

Acute compartment syndrome, Amputation, Awareness, Necrosis, Rubber band syndrome

INTRODUCTION

Rubber band syndrome is a rare condition seen in younger children mainly in communities where rubber bands are worn around the wrist for decorative purposes or in some specific geographical regions as a customary to tie a sacred thread on the wrist for religious purpose.[1] The constrictive effects of elastic bands may cause an unintentional circumferential constriction, with venous stasis and congestion of the hand. If left unnoticed and untreated, this may lead to acute compartment syndrome. In patients with an established compartment syndrome, prompt intervention is paramount in preventing tissue necrosis, neurovascular compromise, and permanent functional deficits.[2]

There have been few literature studies which described unusual foreign bodies tied circumferentially in the limbs for various reasons which later cause serious constriction bands, ulcers, discharging sinus and compartment syndrome.[2-4] We report a case of 46 years old male with history of tying rubber bands around his base of fingers resulting in loss of his fingers and permanent functional deficits.

CASE REPORT

A 46 years right-handed gentleman residing idle at Chabahil-7, Kathmandu presented to plastic surgery department as a referred case on 4th July 2017 for non-healing wound on bilateral hand following auto-amputation of right thumb and left ring finger 20 days prior to presentation. With failed marriage and demise of his father 3 years before, he started tying tightly multiple rubber bands in all of his fingers either because of obsessive-compulsive disorder (OCD) or superstitious belief of bringing fortune and success in his life without working. After a year of such act, he had swelling of his right ring finger (RRF) and right small finger (RSF) which was managed conservatively with 10 days of hospital stay. After returning home, he continued the practice of tying the rubber bands thus leading to necrosis of his right long finger (RLF) with formation of maggots. Thus, amputation of the RLF was done 1 year back. A month later he again underwent amputation of his right index finger (RIF). This time also he presented with the necrosis of his right thumb and left ring finger (LRF). As usual, orthopedic team evaluated him and did debridement and then was consulted for the non-healing debrided wound.

Figure 1. (a) Pre-op dorsal view of left hand, (b) Pre-op radial view of left hand

On examination, right hand consists of only the ring and small fingers with flexion deformity at both proximal interphalangeal joint (PIPJ) and distal inter-phalangeal joint (DIPJ) with extension deficit of around 20 degrees with decreased sensation on his right ring finger. On the base of his RRF, there is a circular scar with depression of approx. 0.5cm width and at the middle of the proximal phalanx of his RSF, there is a linear circular scar. Amputated stump of right thumb had granulating wound of 2×1.5 cm^2. On his left hand, there was granulating wound on the ulnar aspect of the proximal phalanx of left long finer (LLF). There is a depressed circular scar of 6mm width on the base of the left index finger (LIF) and non-depressing circular scars near the base of remaining two fingers. Sensation on his left hand is intact with flexion deformity of all the 3 fingers with no extension deficit.

Figure 1. (a) Post-op dorsal view of left hand, (b) Post-op radial view of left hand

With the history and clinical findings, the diagnosis was made as rubber band syndrome, another name for this condition being the acquired constricting band syndrome. The consent was taken not just for the treatment but even for the publication. As a part of treatment, he underwent debridement and split thickness skin grafting on the raw area and partial release of the constricting scar on the dorsal aspect of the LSF with removal of scar and double Z-plasty.

DISCUSSION

Rubber band syndrome was first described by Hogeboom and Stephens in 19615. Agarwal et al. reported 3 cases of rubber band syndrome being successfully managed surgically with removal of the buried rubber band.[6] Rasool and his colleague reported 2 cases in journal of hand surgery with the title "rubber band constriction of the wrist".[7] Kumaraswamy reported a case of embedded rubber band on a 5 years old girl who presented with the discharging sinus within a circumferential scar in her right arm of 6 months duration.[8] Similarly, Arora et al. reported 3 cases of discharging sinus at the wrist due to a sacred thread tied around it and was forgotten by the parents.[3] On searching in the internet for the published article, there were few more cases found reporting the similar findings.[2,4,5,9] All these literatures are findings in the pediatric group but no literatures were available in the adult group. Elastic bands can have constrictive effects on the hand depending on their thickness and tensile properties, with tight bands with less elastic properties causing a more acute presentation. Acute compartment syndrome is a clinical condition caused by sustained elevated pressures in a fascial compartment leading to compression of blood vessels and nerves and eventually ischemia and necrosis of the contents within.[2] In our case, the initial presentation to the hospital with two fingers swelling was secondary to unintentional circumferential constriction resulting venous stasis and congestion of the hand. The continued practice led to development of compartment syndrome ultimately leading to gangrene of the finger involved needing for amputation.

There are few experimental studies that show the effects on neurovascular structures of tourniquets of varying pressures and width.[7] Hixon et al. have shown the highly variable and inconsistent pressure generated by rubber bands when used as digital tourniquets.[10]

Increased awareness and education are important in communities where circumferential objects are used for cultural decoration. Patients presenting with swelling of an extremity due to constrictive bands should have emergency surgery to decompress the dorsal and palmar compartments if present early. Radical surgery like amputation should not be carried our initially even though the viability of the limb may be questionable.[2]

Our patient presented multiple time with the same problem but he was treated only for the symptoms for which he presented. After the initial presentation, if holistic approach by the treating doctor and multidisciplinary approach was taken, then he might not have presented again with the same problem and the scenario could have been different. Thus, this case highlights the value of not just the increased awareness and education of the patient but also the prompt recognition and treatment with multidisciplinary approach, to prevent the devastating effects of acute compartment syndrome of the hand. This might be the first case to be reported in the adult patient.

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