

Buddy Taping: Is It a Safe Method for Treatment of Finger and Toe Injuries?

Sung Hun Won, MD^a, Sanglim Lee, MD^{*a}, Chin Youb Chung, MD, Kyoung Min Lee, MD, Ki Hyuk Sung, MD[†], Tae Gyun Kim, MD, Young Choi, MD, Sang Hyeong Lee, MD[‡], Dae Gyu Kwon, MD[§], Jae Hong Ha, MD, Seung Yeol Lee, MD^b, Moon Seok Park, MD

Department of Orthopedic Surgery, Seoul National University Bundang Hospital, Seongnam,

**Department of Orthopedic Surgery, Sanggye Paik Hospital, Seoul,*

†Department of Orthopaedic Surgery, Myongji Hospital, Kwandong University College of Medicine, Goyang,

‡Department of Orthopaedic Surgery, Dongguk University Ilsan Hospital, Goyang,

§Department of Orthopaedic Surgery, Inha University Hospital, Incheon, Korea

Background: Buddy taping is a well known and useful method for treating sprains, dislocations, and other injuries of the fingers or toes. However, the authors have often seen complications associated with buddy taping such as necrosis of the skin, infections, loss of fixation, and limited joint motion. To our knowledge, there are no studies regarding the complications of buddy taping. The purpose of this study was to report the current consensus on treating finger and toe injuries and complications of buddy taping by using a specifically designed questionnaire.

Methods: A questionnaire was designed for this study, which was regarding whether the subjects were prescribed buddy taping to treat finger and toe injuries, reasons for not using it, in what step of injury treatment it was use, indications, complications, kinds of tape for fixation, and special methods for preventing skin injury. Fifty-five surgeons agreed to participate in the study and the survey was performed in a direct interview manner at the annual meetings of the Korean Pediatric Orthopedic Association and Korean Society for Surgery of the Hand, in 2012.

Results: Forty-eight surgeons (87%) used buddy taping to treat finger and toe injuries, especially proximal interphalangeal (PIP) injuries of the hand, finger fractures, toe fractures, metacarpophalangeal injuries of the hand, and PIP injuries of the foot. Sixty-five percent of the surgeons experienced low compliance. Forty-five percent of the surgeons observed skin injuries on the adhesive area of the tape, and skin injuries between the injured finger and healthy finger were observed by 45% of the surgeons.

Conclusions: This study sheds light on the current consensus and complications of buddy taping among physicians. Low compliance and skin injury should be considered when the clinician treats finger and toe injuries by using buddy taping.

Keywords: *Buddy taping, Complication, Toe, Finger, Injury*

Received January 28, 2013; Accepted July 1, 2013

Correspondence to: Kyoung Min Lee, MD

Department of Orthopedic Surgery, Seoul National University Bundang Hospital, 82 Gumi-ro 173beon-gil, Bundang-gu, Sungnam 463-707, Korea
Tel: +82-31-787-6261, Fax: +82-31-787-4056

E-mail: oasis100@empal.com

^aThe first two authors contributed equally to this study.

^bCurrent address: Department of Orthopaedic Surgery, Myongji Hospital, Kwandong University College of Medicine, Goyang, Korea

There are many methods for the immobilization of finger or toe injuries. Buddy taping is one such method. Buddy taping is the act of bandaging a damaged finger or toe together with a healthy one. The healthy digit acts as a splint, keeping the damaged one in a natural position for healing. It is a well known useful method for treating sprains, dislocations, and other injuries of fingers or toes, especially fifth metacarpal fractures.^{1,2)} Some comparative studies of casting versus taping to treat fifth metacarpal fractures reported that taped patients recovered more quickly and

with superior functionality than those in the cast group.¹⁾

The authors, however, often experience complications associated with buddy taping such as necrosis of the skin, infection, loss of fixation, and limited joint motion. To our knowledge, there are no studies on the complications of buddy taping although there have been some studies of complications associated with functional fracture-bracing, similar to buddy taping.³⁻⁵⁾ These studies reported necrosis of the skin over the metacarpal as a complication of functional fracture-bracing, which was explained by the high pressure under the bracing.⁴⁾

The purpose of this study was to report current consensus on treating finger and toe injuries using buddy taping as well as complications of buddy taping, using a specifically designed questionnaire.

METHODS

This study was exempt from Institutional Review Board approval at Seoul National University Bundang Hospital (a tertiary referral center for orthopedic surgery) because it used only anonymous questionnaires.

A 7-item questionnaire regarding the treatment of finger, toe, metacarpal bone, and metatarsal bone injuries using buddy taping was designed by two pediatric orthopedic surgeons, one foot surgeon, and one hand surgeon

(Appendix 1). The questionnaire was completed through direct interview by two orthopedic surgeons. The questionnaire survey was administered at the annual meetings of the Korean Pediatric Orthopedic Association and Korean Society for Surgery of the Hand in 2012.

The participants were asked to answer the first three questions that included age, date of orthopedic or plastic board certification, and types of orthopedic subspecialty societies in which they had membership. Age was divided into three groups: group 1 was 31 to 40 years of age, group 2 was between 41 to 50 years of age, and group 3 was over 50 years of age. We also divided orthopedic or plastic board certificates into three groups by their duration of board certification: group 1 was under 5 years, group 2 was between 5 to 9 years, and group 3 was over 10 years. The subspecialties of the participants were obtained by their society memberships such as the Korean Pediatric Orthopedic Association, Korean Society for Surgery of the Hand, Korean Shoulder and Elbow Society, Korean Fracture Society, and Korean Society of Plastic and Reconstructive Surgeons.

An additional four questions asked about the use of buddy taping to treat finger and toe injuries, reasons for not using it, if using then for what step in injury treatment it is used, indications of buddy taping, complications of buddy taping, kinds of tape for buddy taping, and special methods for preventing skin injury during buddy taping.

Descriptive statistics was performed. All frequencies are expressed as a percentage. The averaged values are expressed as the mean and standard deviation.

RESULTS

A total of 55 surgeons agreed to participate. The demographics of the participants are summarized in Table 1.

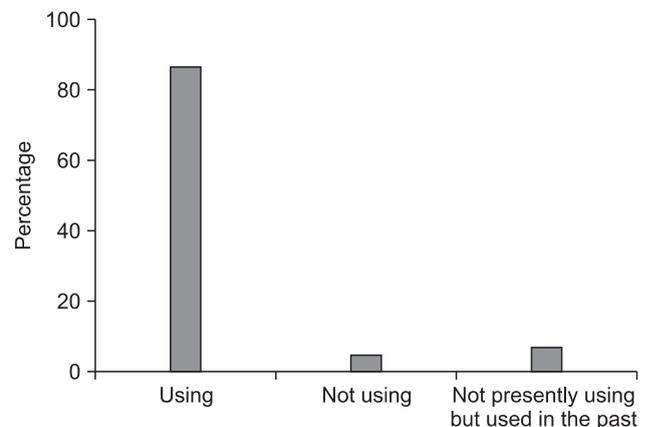


Fig. 1. Experience of using buddy taping to treat hand or foot injuries.

Table 1. Demographics of Participants

| Characteristic | No. (%) |
|-------------------------------------------------------|---------|
| Age (yr) | |
| 31–40 | 28 (51) |
| 41–50 | 19 (35) |
| ≥ 51 | 8 (15) |
| Duration of board certificate (yr) | |
| < 5 | 12 (22) |
| 5–10 | 8 (15) |
| ≥ 10 | 18 (33) |
| Joined society | |
| Korean Pediatric Orthopedic Association | 20 (36) |
| Korean Society for Surgery of the Hand | 34 (62) |
| Korean Shoulder and Elbow Society | 9 (16) |
| Korean Fracture Society | 17 (31) |
| Korean Society of Plastic and Reconstructive Surgeons | 6 (11) |

Forty-eight surgeons (87%) used buddy taping, 3 surgeons (5%) did not, and 4 surgeons (7%) were not presently using it but used it in the past (Fig. 1). In the using group, 6 surgeons (11%) used buddy taping for immobilization of fractures, 16 surgeons (29%) used it for exercise therapy or as a physical therapy step after treatment of fractures by casting or splinting, and 30 surgeons (55%) used both steps according to displacement of the fracture (Fig. 2). Their indications for buddy taping were finger fracture in 38 (69%), metacarpal fracture in 4 (7%), metacarpophalangeal (MCP) joint injury in 24 (44%), proximal interphalangeal (PIP) joint injury in 39 (71%), carpometacarpal joint injury of the hand in 3 (5%), toe fracture in 36 (65%), metatarsal fracture in 3 (5%), and

PIP joint injury of the foot in 19 (35%)(Fig. 3). Seven surgeons were not using buddy taping due to insufficiency of the adhesive power of the tape, 6 surgeons were not using it due to complications such as injuries of the skin and frequent limits of motion, and 3 surgeons did not use due to decreasing compliance of patients.

Regarding the complications of buddy taping, low compliance of patients and skin injury were common complications. Thirty-six surgeons (65%) experienced low compliance by patients such as removing the tape

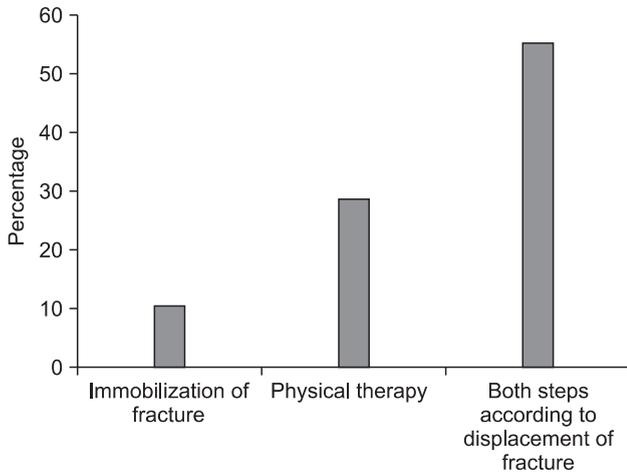


Fig. 2. Treatment steps in the usage group.

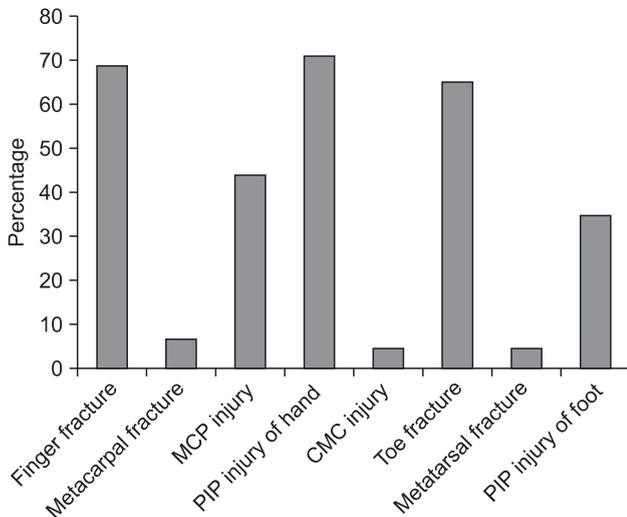


Fig. 3. Indications of buddy taping. MCP: metacarpophalangeal, PIP: proximal interphalangeal, CMC: carpometacarpal.

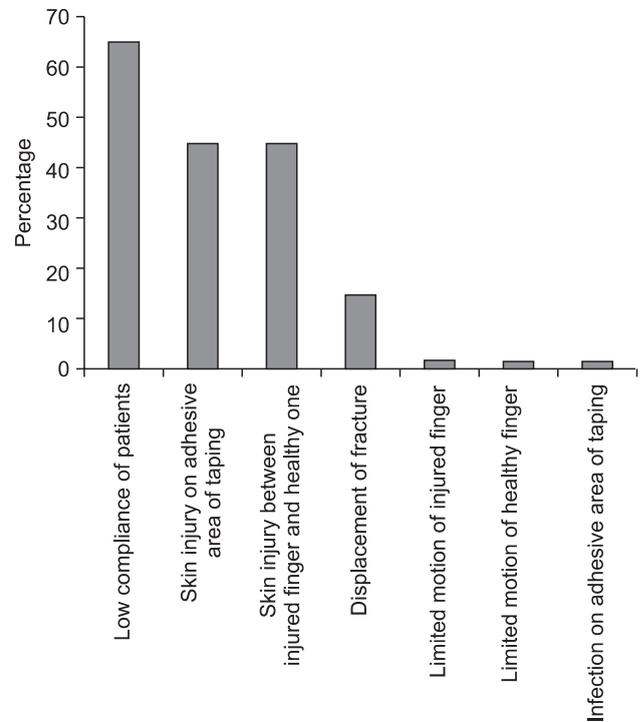


Fig. 4. Complications of buddy taping.

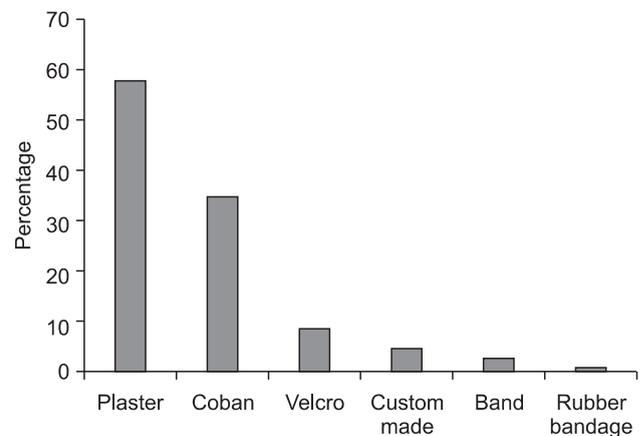


Fig. 5. Types of tape for buddy taping.

themselves. Twenty-five surgeons (45%) experienced skin injury on the adhesive tape area, and 25 surgeons (45%) observed skin injuries between injured fingers and healthy ones. Furthermore, 8 surgeons (15%) observed displacement of fractures due to the gradual decreasing power of the adhesive, 2 surgeons observed limited motion of the injured finger, 2 surgeons observed limited motion of the healthy finger, and 2 surgeons observed infections on the adhesive area of the tape (Fig. 4).

The types of tape for buddy taping that were commonly used included paper plaster tape and self-adherent wrap (Coban, 3M, St. Paul, MN, US) for 32 surgeons (58%) and 19 surgeons (35%), respectively. Velcro (Velcro, Amsterdam, Netherlands), custom made, bands, and rubber bandages were also used for buddy taping by 5, 3, 2, and 1 surgeon, respectively (Fig. 5).

Twenty-four surgeons (43%) applied gauze between the injured finger and healthy finger to prevent skin injury, another 3 surgeons educated patients to reapply buddy taping after washing their injured hand or foot.

DISCUSSION

This study examined the current consensus on treating finger and toe injuries using buddy taping, along with complications of buddy taping, within specialists. Of participants in this study, surgeons were almost always (87%) using buddy taping to treat finger and toe injuries, especially PIP injuries of the finger, finger fractures, toe fractures, MCP injuries of the hand, and PIP injuries of the toes. However, sixty-five percent of the surgeons experienced low compliance. Forty-five percent of the surgeons observed skin injuries on the adhesive area of the tape, and 45% of the surgeons observed skin injuries between the injured finger and healthy finger.

This study has some limitations to be addressed. First, the questionnaire designed for this study was not previously validated. However, the authors could reduce possible bias by interviewing the orthopedic or plastic surgeons directly. Second, overall the orthopedic surgeons' perspectives were not provided because the majority of participants were pediatric or hand surgeons. Third, this study was designed based on an anonymous questionnaire, and as such we could not obtain precise information about custom made materials or the location of taping. In general, the location of buddy taping was either the middle or proximal phalanx. Fourth, this study presents the results found by questionnaire analysis on the current practice of using buddy taping and its complications, so

we did not report alternative methods of buddy taping or methods of preventing its complications. However, because to our knowledge this study is the first report about complications of using buddy taping, we deem that our study arouses clinicians' attention to the use of buddy taping. Further prospective studies will be needed.

The compliance of patients is important for success of the conservative treatment of hand injuries.^{6,7)} However, it is well known that patients with injured hands, especially mallet fingers and fifth metacarpal fractures, are noncompliant.^{6,8-10)} Previous studies showed that the most important factor in the success of splint treatment for mallet fingers is patient compliance.^{6,11)} They recommended that if the patient removes the splint and the finger flexes for any reason, an additional 8 weeks of immobilization will be needed from that moment.¹¹⁾ Our study also found that clinicians frequently observed low compliance of patients using buddy taping, by removing the tape themselves.

Skin complications are also an important factor that clinicians should consider when using buddy taping. Geiger and Karpman⁴⁾ reported three cases of skin necrosis beneath the dorsal pad of a metacarpal brace, despite having given patients instructions to loosen the brace as necessary for comfort. All three patients had superficial necrosis that resolved with nonoperative treatment. The authors referred to previous controlled animal studies in which pressure as low as 100 mmHg sustained for more than 6 hours could produce tissue necrosis. Some surgeons participating in our study recommended applying gauzes between the injured finger and the healthy one to prevent skin injury, and educated patients to reapply buddy taping after washing their injured hand or foot.

This study sheds light on the current consensus and complications of buddy taping among physicians. Low patient compliance and skin injury should be considered when a clinician is treating finger and toe injuries by using buddy taping. Clinicians should educate patients who have unstable injuries or an acute stage of injury to strictly maintain the buddy taping. On the contrary, more attention needs to be focused on skin problems due to buddy taping for patients who do not need strict immobilization. We believe that the results of this study could arouse clinicians' attention to the use of buddy taping. However, more evidence and investigation will be needed.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Braakman M, Oderwald EE, Haentjens MH. Functional taping of fractures of the 5th metacarpal results in a quicker recovery. *Injury*. 1998;29(1):5-9.
2. van Aaken J, Kampfen S, Berli M, Fritschy D, Della Santa D, Fusetti C. Outcome of boxer's fractures treated by a soft wrap and buddy taping: a prospective study. *Hand (N Y)*. 2007;2(4):212-7.
3. Owens C. Necrosis of the skin over the metacarpal as a result of functional fracture-bracing: a report of three cases. *J Bone Joint Surg Am*. 1991;73(5):789.
4. Geiger KR, Karpman RR. Necrosis of the skin over the metacarpal as a result of functional fracture-bracing: a report of three cases. *J Bone Joint Surg Am*. 1989;71(8):1199-202.
5. Nossaman BC, Rayan GM. Skin necrosis complicating functional bracing. *Am J Orthop (Belle Mead NJ)*. 1998;27(5):371-2.
6. Anderson D. Mallet finger: management and patient compliance. *Aust Fam Physician*. 2011;40(1-2):47-8.
7. Handoll HH, Vaghela MV. Interventions for treating mallet finger injuries. *Cochrane Database Syst Rev*. 2004;(3):CD004574.
8. Breddam M, Hansen TB. Subcapital fractures of the fourth and fifth metacarpals treated without splinting and reposition. *Scand J Plast Reconstr Surg Hand Surg*. 1995;29(3):269-70.
9. Kuokkanen HO, Mulari-Keranen SK, Niskanen RO, Haapala JK, Korkala OL. Treatment of subcapital fractures of the fifth metacarpal bone: a prospective randomised comparison between functional treatment and reposition and splinting. *Scand J Plast Reconstr Surg Hand Surg*. 1999;33(3):315-7.
10. Theeuwens GA, Lemmens JA, van Niekerk JL. Conservative treatment of boxer's fracture: a retrospective analysis. *Injury*. 1991;22(5):394-6.
11. Perron AD, Brady WJ, Keats TE, Hersh RE. Orthopedic pitfalls in the emergency department: closed tendon injuries of the hand. *Am J Emerg Med*. 2001;19(1):76-80.

Appendix I.

1. Do you have experience using buddy taping to treat finger or toe injuries?

- 1) No
- 2) Yes
- 3) Not presently, but used in the past

1-1. If used, for what steps of management do you use buddy taping?

- 1) For immobilization of fractures
- 2) For exercise therapy or physical therapy steps after treatment using splinting or casting of fractures
- 3) For both steps, according to displacement of the fracture

1-2. If used, choose the indication(s)

- 1) Fracture of phalanx (finger)
- 2) Fracture of metacarpal bone
- 3) Dislocation or injury of ligament of metacarpophalangeal (MCP) joint
- 4) Dislocation or injury of ligament of proximal interphalangeal (PIP) joint of hand.
- 5) Dislocation or injury of ligament of carpometacarpal (CMC) joint
- 6) Fracture of phalanx (toe)
- 7) Fracture of metatarsal bone
- 8) Dislocation or injury of ligament of proximal interphalangeal joint of foot
- 9) Other (specify) _____

1-3. If not used, what's the reason?

- 1) Insufficiency of adhesive power
- 2) Decreased compliance of patients
- 3) Injury of skin
- 4) Infection
- 5) Frequent occurrence of limited motion
- 6) Other (specify) _____

2. Choose the complication(s) that you have experienced using buddy taping

- 1) Injury of skin on adhesive area of taping
- 2) Infection on adhesive area of taping
- 3) Displacement of fracture due to gradual decreasing power of the adhesive
- 4) Limited motion of the injured phalanx
- 5) Limited motion of the adjacent phalanx
- 6) Injury of skin between the injured area and the adjacent area
- 7) Infection
- 8) Low compliance of patients: removal of the tape themselves
- 9) Other (specify) _____

2-1. Choose the most common complication you experienced from the above list.

3. What tapes do you use for fixing buddy taping?

- 1) Plaster tape
- 2) Coban
- 3) Rubber bandage
- 4) Band
- 5) Other (specify) _____

4. Do you have special methods for preventing skin injury during buddy taping?

- 1) Have not experienced an injury
- 2) Apply gauze between the injured and the adjacent phalanx