

Case report

Effect of deltoid kinesio taping for midshaft fracture of humerus managed with intramedullary splinting

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ABSTRACT

Fatal road traffic accidents are more in the range of 25-44 years of the age. Factor causing road traffic accident is increased due to number of vehicles. The radius and the ulna constitute as the bones of the forearm. These bones are specially designed in order to enable the movements that are unique for the upper limb, such as supination and pronation. Frykman classification is a system of categorizing Colles' fractures. KT is considered an effective intervention strategy for patients with shoulder pain when it is combined with conventional physical therapy. A 35-year-old male driver with right-hand dominance complains of pain in left lower limb, right lower limb, left and right upper limb. He had RTA while going to the office and had sustained injuries on the right and left upper and lower limb. This case report demonstrates the patient with humerus fracture with internal fixation using plates and kinesio taping was useful for relieving pain increase ROM, and Frykman type 6 fracture to radius ulna of left hand with external fixators using screws and rods. It provides rehabilitation plan to relieve pain, increase ROM and helps in reeducation post operatively. Patient was able to resume the activities of daily living after rehabilitation.

Keywords: Rehabilitation, Internal fixators, External fixators, Kinesio taping.

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INTRODUCTION

Fatal road traffic accidents are more in the range of 25-44 years of the age. Factor causing road traffic accident is increased due to number of vehicles. Pedestrians were most vulnerable accounting for total fatalities followed by motorized two wheelers. Heavy Vehicles were found to be mostly involved 58.52% of cases and most accidents 83.05% occurred on highways. Majority of cases sustained multiple injuries [1].

The humerus is the longest and largest bone of the upper limb. Fractures of the humeral shaft are common, account for approximately 3% of all orthopedic injuries [2]. The forearm constitutes of the bone's radius and ulna. The bones are specially designed in order to enable supination and pronation [3]. Frykman classification is a system of categorizing Colles' fractures.

Shoulder injuries are common in athletes. Taping provide support for injured soft tissues and can enable the athlete to continue participation in sports more comfortably [4]. Kinesio Taping is designed as such that it helps to prevent musculoskeletal injuries and helps to reduce pain and increases ROM [5]. Tapes are applied over joints and muscle areas to facilitate mobility and reduce the risk of further injury in a taped area [6]. KT enhances the activity of the muscles depending

on its taping methods, and creates a space between the skin and muscle, when applied to skin, allowing for smooth blood and lymph flow [7]. Kinesio tape is easy to apply to any part of the body at any muscle. That's why kinesio taping now become a common treatment in clinical conditions [8] as shown in figure 5.

Patient information

A 35-year-old male driver with right-hand dominance complains of pain in left lower limb, right lower limb, left and right upper limb. He had road traffic accident while going to the office and had sustained injuries on the right and left upper and lower limb. People brought him at Acharya Vinoba Bhave Rural Hospital (AVBRH), DMIMS (DU) Sawangi Meghe, Wardha, Maharashtra for the further treatment where all investigations has been carried out. Investigations revealed compound grade 2 midshaft tibia fibula fracture left side, fracture distal end radius (Frykman type 6) left side, fracture midshaft humerus right side.

Clinical findings

Patient was examined in a supine lying position. On inspection of left leg lacerated wound of 2×3 cm present over anterior aspect of leg, puncture wound present over medial aspect of leg deformity present. On palpation the local temperature was raised, swelling and tenderness was present over midshaft. On palpation of the

right leg abrasion and swelling was present over anterior aspect of knee. Inspector findings were confirmed on palpation, tenderness was present on the anterior aspect of knee, knee full ROM is painful, active toe movement is present and distal circulation intact. On inspection of the right arm swelling and deformity was present on palpation tenderness was present. On inspection of left forearm deformity was present over wrist joint with no scars or sinuses seen. On palpation tenderness and deformity was present over wrist joint with painful ROM.

Figure 1. Fracture midshaft humerus right side



Figure 2. Fracture distal end radius (Frykman type 6) left side



Figure 3. Extra medullary splinting



This is useful for fixation of fractures of long bones. A long hollow rod, called 'nail' is inserted in the medullary cavity of the long bone.

Figure 4: Splinting outside the body: Pins are inserted through the skin into the bone, and the same are held outside with clamps and rod (external fixators). This is used to hold the fragments of an open fracture.

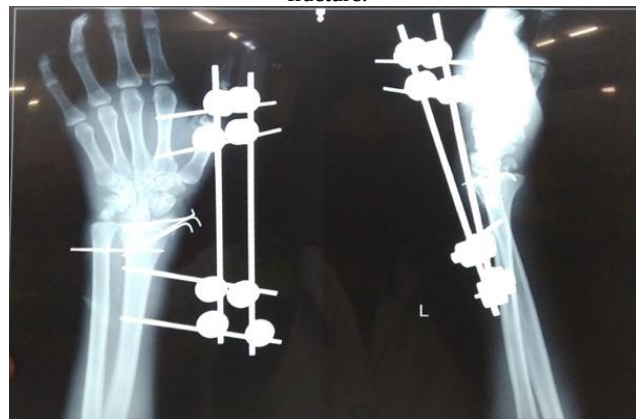


Table 1. Isometric strength of right and left upper limb

Movement	Right	Left
Shoulder		
Flexion	Poor	Good
Extension	Poor	Good
Abduction	Poor	Good
Adduction	Poor	Good
External Rotation	Poor	Good
Internal Rotation	Poor	Good
Elbow		
Flexion	Poor	Good
Extension	Poor	Good
Supination	Poor	Good
Pronation	Poor	Good
Wrist		
Flexion	Good	Poor
Extension	Good	Poor
Radial Deviation	Good	Poor
Ulnar Deviation	Good	Poor

Table 2: Range of motion of upper and lower limb

Joint	Right	Left
Shoulder		
Flexion	Unable to Perform Movement	160
Extension	Unable to Perform Movement	Na
Abduction	Unable to Perform Movement	160
Adduction	Unable to Perform Movement	Na
External Rotation	Unable to Perform Movement	Na
Joint	Right	Left
Internal Rotation	Unable to Perform Movement	Na
Elbow		
Flexion	Unable to Perform Movement	125
Extension	Unable to Perform Movement	0
Supination	Unable to Perform Movement	70
Pronation	Unable to Perform Movement	70
Wrist		
Flexion	80	Unable to Perform Movement
Extension	67	Unable to Perform Movement
Radial Deviation	18	Unable to Perform Movement
Ulnar Deviation	25	Unable to Perform Movement

Medical treatment

Internal fixation by extra medullary splinting (this is useful for fixation of fractures of long bones. A long hollow rod, called 'nail'

is inserted in the medullary cavity of the long bone.) was done where mid shaft humerus fracture was found and stabilized it with plating. The 8-screw plating was used as shown in Figure. 3. External fixators i.e. splinting outside the body (Pins are inserted through the skin into the bone, and the same are held outside with clamps and rod (external fixators). This is used to hold the fragments of an open fracture) applied by using screws and rods as shown in Figure 5.

Therapeutic management

Pre-Operative

The short-term goals were to reduce the pain, swelling, tenderness and edema. The long-term goals were to prevent muscle loss, increase strength, reduce pain and strength.

Post-Operative

The short-term goals were to reduce pain and tenderness, maintain and to restore full range of motion and strength, promote early mobility, avoid pressure sores, encourage walking. The long-term goals were to reduce pain, increase ROM, increases functional stability, reeducation of muscle.

Table 3. Care Plan

Weeks	Intervention	Fitt
Week 1	Cryotherapy- Icepack; Active Movements for Unaffected Limbs and Unaffected Joints;	10-15 Mins, Twice A Day 10r × 2 Sets, Twice A Day;
Week 2	Cryotherapy- Icepack; Active Assisted Movements, Flexion, Extension, Adduction, Abduction.	10-15 Mins, Twice A Day; 10r × 3 Sets, Twice A Day;
Week 3	Cryotherapy- Icepack; Active Assisted Movement to Increase Range and Reduce Joint Stiffness, Active Shoulder Flexion (0°-10°), Active Shoulder Extension (10°-0°) To Maintain Shoulder Flexion and Extension Strength, Active Shoulder Abduction (0°-10°), Active Shoulder Adduction (10°-0°) To Maintain Shoulder Abduction and Adduction Strength; Active Movements of Fingers, Elbow Flexion, Extension By 10° To Increase Range and Reduce Joint Stiffness	10-15 Mins, Twice A Day; 10r × 2 Sets, Twice A Day
Week 4	Cryotherapy- Icepack; Active Assisted Movement, Active Shoulder Flexion (0°-20°), Active Shoulder Extension (15°-0°) To Maintain Shoulder Flexion and Extension Strength, Active Shoulder Abduction (0°-20°), Active Shoulder Adduction (15°-0°) To Maintain Shoulder Abduction and Adduction Strength. Active Movements of Fingers, Elbow Flexion, Extension By 20° To Increase Range and Reduce Joint Stiffness.	10-15 Mins, Twice A Day; 10r × 2 Sets, Twice A Day
Week 4 – 8	Cryotherapy- Icepack; Kinesio Taping Should Be Used From 4 Week at The Deltoid Muscle from Origin to Insertion; Active Assisted Movement, Active Shoulder Flexion (0°-45°), Active Shoulder Extension to Maintain Shoulder Flexion and Extension Strength, Active Shoulder Abduction (0°-45°), Active Shoulder Adduction to Maintain Shoulder Abduction and Adduction Strength. Active Wrist Flexion and Extension By 5°. Active Movements of Fingers, Elbow Flexion, Extension By 45° To Increase Range and Reduce Joint Stiffness.	10-15 Mins, Thrice A Day; After Every 5-7 Days We Should Change the Tape 10r × 2 Sets, Thrice A Day
Week 8 – 12	Cryotherapy- Icepack; Kinesio Taping Should Be Used; To Reduce Pain, Increase Rom, It Influences Muscle Reeducation. Active Assisted Movement, Active Shoulder Flexion (0-90°), Active Shoulder Extension to Maintain Shoulder Flexion and Extension Strength, Active Shoulder Abduction (0-90°), Active Shoulder Adduction to Maintain Shoulder Abduction and Adduction Strength. Active Wrist Flexion and Extension By 10°. Active Movements of Fingers, Elbow Flexion, Extension By 70° To Increase Range and Reduce Joint Stiffness.	10-15 Mins, Thrice A Day; 10r × 3 Sets, Twice A Day
Week 12 – 16	Cryotherapy- Icepack; Kinesio Taping Should Be Used; Active Assisted Movement, Active Shoulder Flexion (0-145°), Active Shoulder Extension to Maintain Shoulder Flexion and Extension Strength, Active Shoulder Abduction (0-145°), Active Shoulder Adduction to Maintain Shoulder Abduction and Adduction Strength; Active Wrist Flexion and Extension By 15°. Active Movements of Fingers, Elbow Flexion, Extension By 70° To Increase Range and Reduce Joint Stiffness.	10-15 Mins, Thrice A Day; 15r × 3 Sets, Twice A Day

DISCUSSION

In this case, patient had RTA and had insidious and gradual pain in right and left upper limb and right and left lower limb which was then operated with external fixation to Frykman type 6 radius and ulna fracture and internal fixation to humerus. A successful plan of care was made for a clinical evaluation. Goals for rehabilitation were as

follows, starting from mild exercises to strengthening and full weight bearing exercises. Taping was applied at the shoulder from origin to the insertion to reduce pain, increase ROM. All the exercises were done twice a day 5-10 sets; ice packs were applied around the fractures area to reduce the discomfort during the therapy. Taping provide

support for injured soft tissues and can enable the athlete to continue participation in sports more comfortably [4]. Kinesio Taping is designed as such that it helps to prevent musculoskeletal injuries and helps to reduce pain and increases ROM [5]. Tapes are applied over joints and muscle areas to facilitate mobility and reduce the risk of further injury in a taped area [6]. KT enhances the activity of the muscles depending on its taping methods, and creates a space between the skin and muscle, when applied to skin, allowing for smooth blood and lymph flow [7]. Kinesio taping was applied on the shoulder joint from origin to insertion to reduce pain, increase ROM, and also helps in muscle reeducation [8].

CONCLUSION

This case report demonstrates the patient with humerus fracture with internal fixation using plates and Frykman type 6 fracture to radius ulna of left hand with external fixators using screws and rods. It provides a rehabilitation plan that helps to reduce pain, edema, restore strength and range of motion post operatively. Kinesio taping was applied on the deltoid from origin to insertion from the 4 weeks. Kinesio taping helps in increase ROM, relieves pain, improve joint stability, reduced strain and prevent injury. Patient was able to resume the activities of daily living after rehabilitation. It also helps in reeducation of the muscle.

REFERENCES

1. Kual A, Sinha US, Pathak YK, Singh A, Kapoor AK, Sharma S, et al., 2005. "Fatal road traffic accidents, study of distribution, nature and type of injury". J Indian Acad Forensic Med. 27(2), 71-6.
2. Anjali Bais, Pratik Phansopkar, 2020. "Impact of Pilates Training versus Progressive Muscle Relaxation Technique on Quality of Life in Menopausal Women- A Comparative Study". Indian Journal of Forensic Medicine & Toxicology. 15(1), 7-11.
3. Mishra S, Darda P, Naqvi W, Sahu A, 2020. "Regaining activities of daily living in patient with middle cerebral artery stroke-A case report". Medical Science.7.
4. Choi J-H, 2017. "Effects of Kinesio Taping on Muscle Tone/Stiffness in Patients with Shoulder Pain". Korean Soc Phys Med. 12(3), 43-7.
5. Birrer RB, Poole B, 2004. "Athletic taping, part 4: the shoulder and elbow: added support enables the athlete to remain active". J Musculoskelet Med. 21(9), 477-82.
6. Km R, Sl K, J R, 2000. "The effect of recurrent ankle inversion sprain and taping on proprioception at the ankle". Med Sci Sports Exerc. 32(1), 10-5.
7. Yong-ho Cho PT, 2015. "The effects of motion taping on young males' lumbar stabilization exercise". J Korean Soc Phys Med. 10(3), 285-90.
8. Shamus JL, Shamus EC, 1997. "A Taping Technique for the Treatment of Acromioclavicular Joint Sprains: A Case Study". J Orthop Sports Phys Ther. 25(6), 390-4.

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