

KINESIO TAPING : BOON OR BANE FOR SUPRACONDYLAR FRACTURE FEMUR

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Abstract -

A single case study design was used to investigate the effects of kinesio tape to reduce pain and tightness in post-operative fractures. A visual analogue scale was used to measure pain, knee range of motion was used to measure available range and Manual muscle testing was used to measure muscle strength. The study involved three phases in an ABC design. They were 1- week pre assessment, 1 week-treatment phase and 1 week post treatment assessment phase. The technique resulted in reduction in pain, improved range of motion and improvement in quadriceps and hamstring strength in case of malunited supracondylar fracture.

Although single case study design limits generalization of the results, it does provide evidence of the beneficial response obtained by use of kinesiotaping in malunited supracondylar fracture patients.

Key Words: Kinesio Taping, Malunited supracondylar Fracture,

Introduction -

Supracondylar fracture of femur is a complicated fracture to treat especially when it is malunited. Possible complications after period of immobilization are knee stiffness, pain and tightness, which are challenging to treat for physiotherapist.

Kinesio taping is gold standard therapeutic taping technique in treating various musculoskeletal or orthopaedic, circulatory, paediatric physiotherapy.^[1]

Though supracondylar fractures of the femur in adults are relatively uncommon and account for only 7% of all femoral fractures.^[2] However these fractures are often complex injuries, which present with numerous complications, like mal alignment, flexion contractures, stiffness and limb length discrepancies.^[3] Effect of kinesio taping on pain and stiffness or muscle tightness has been resulted in significant increase in range of motion and various joints in body. Amongst common conditions kinesio taping is beneficial in ITB syndrome, patellar fracture, quadriceps and hamstring strains, Rib fractures and ankle sprains. Possible results of knee stiffness are shortening, gait deviations.^[4] Basically Joint stiffness is caused by inflammation in the synovium, the lining of the joint. The abnormal synovial lining is the cause of many types of arthritis. The only physical expression of synovial involvement may be joint pain, or there may be swelling, redness, and warmth associated with the affected joint.

As position of immobilization is knee extension followed by tightness of quadriceps and weakness of hamstrings. There are various treatment modalities for the management of these fractures i.e. conservative treatment, traction techniques, condylar blade plate, dynamic condylar screw, interlocking nails etc.^[5] In physiotherapy management Mobilisation, stretching along with electrotherapeutic modalities like IFT, TENS help in reducing pain and postoperative stiffness.

Other approaches to treat joint stiffness are long acting anti-inflammatory medication.

Purpose of the study was to find the effectiveness of kinesio tape in decrease of pain and tightness in postoperative malunited supracondylar fracture of femur. As, there was hardly any study presented on the use of kinesio tape to reduce pain and tightness in post operative fractures.^[6]

Case report- History

A 38 year old male had undergone internal fixation for supracondylar fracture of femur four months back came to Orthopedic department, RMC with the complaints of pain and difficulty in bending the right



knee. X ray investigation was advised under orthopaedic opinion, where malunion of right sided supracondylar fracture was seen.

After the X-ray, the patient was referred to physiotherapy department.

Physical Examination revealed following findings:

Pain history

Site : Around right knee Onset: Sudden
Duration: 4 months Quality: Dull Aching
Quantity: (VAS Score)

Walking

0-----6-----10

Bending knee

0-----8-----10

Rest

0---1-----10

Aggravating factors - walking, bending knee in available range

Relieving Factors - None

- Grade 1 point tenderness over medial condyle of right femur
- Range of motion of bilateral knee joints
- Manual muscle testing of quadriceps and hamstrings

Study Design -

A single case study design was used to achieve the objectives of this project. A-B-A design which was already described for single case study modified as A-B-C design for this study.^[7] This approach has been used previously to study the effectiveness of

Treatment



physiotherapy in The treatment of cervicogenic headache^[8] and tennis elbow.^[9] During post treatment period (C) patient was permitted to continue with the Active Heel Slides & Manual Cycling.

The study was divided into three phases :

Phase (A):

Pre-treatment assessment-Baseline outcome measures (Intensity of pain, knee range of motion, manual muscle testing) were recorded at the beginning of the study in first week. Treatment was not given in this period (A)

Phase(B):

Intervention Phase :

Phonophoresis and Stabilization exercises

Kinesio tape application :

The tape used was kinesio Tex Tape(Kinesio Holding Corporation, Albuquerque, NM) which was water proof , porous and adhesive. The width of the tape was 5 cm and thickness was 0.5mm (Fig. 1).

Along with that active heel slides, continuous passive motion, manual cycling and therapeutic ultrasound was started. Ultrasound: Patient should be in supine lying position, knee should be slightly flexed with support with pillow below the knee, continuous ultrasonic waves of 1 MHz frequency and 1.5 W/cm² power was applied with a 5-cm diameter applicator with aquasonic gel was applied for 5 min per session on the medial femoral condyle.^[6] Outcome measures were recorded at the end of the first week.

Phase (C):

Post-treatment/home exercise programme.

In the final phase, active intervention was withdrawn, but a subject was asked to continue Active heel slides and manual cycling as a home exercise programme for the period of 1 week. Outcome measures were recorded at the end of second week again.



Results:

Assessment	Pain intensity	Knee ROM	MMT	Pressure Biofeedback
Pre-treatment (Phase A)	Walking: 6 Bending knee: 8 Rest: 1	Flexion: 0-45 deg Extension: 45-0 deg	Quadriceps: 4 Hamstrings: 3+	18mm-Hg
Post-treatment (Phase B)	Walking: 4 Bending knee: 6 Rest: 1	Flexion: 0- 52 deg Extension: 52-0 deg	Quadriceps: 4 Hamstrings: 4	22mm-Hg
Post-treatment (Phase C)	Walking: 3 Bending knee: 4 Rest: 1	Flexion: 0- 55 deg Extension: 55-0 deg	Quadriceps: 4 Hamstrings: 4	26mm-Hg

Discussion -

Stiffness has often been considered as a regulated property of the neuromuscular system. Kinesio tape is made of a high elastic quality woven tape that allows it to stretch 30-40% from its resting length. It is designed to simulate the elastic properties of skin. The theory is that it lifts the skin away from the muscle fascia, facilitating blood flow and drainage of fluids by the lymph system. This effect is thought to promote healing and prevent injury to the muscle and joint. The advantage of the tape is that it can be worn for long periods of time, for days or even weeks¹⁰. According to Kenzo Kase, the creator of Kinesio tape, the tape and taping method (1) corrects muscle function by strengthening weakened muscles, (2) improves circulation of blood and lymph by eliminating tissue fluid or bleeding beneath the skin by moving the muscle, (3) decreases pain through neurological suppression, (4) repositions subluxated joints by relieving abnormal muscle tension, helping to return the function of fascia and muscle and (5) increases proprioception through increased stimulation to skin mechanoreceptors. Unfortunately, the purported effects proposed by Kinesio tape proponents are purely theoretical. No one has provided any scientific evidence that strength, circulation, lymph flow, muscle tension or pain is changed as the result of Kinesio taping^{10,1}. A search through the scientific research revealed two studies, published in 2008, which suggest that

Kinesio Tape does little to alleviate pain or improve muscle strength. In the first study by Dr. Mark Thelen showed improvements in pain-free range of motion movements in patients with shoulder injuries (rotator cuff) after applying kinesio tape.^[10] However, the effect was seen immediately after application and no short or long-term effects were found. In the second study by Dr. Tieh-Cheng Fu, the investigators found that application of Kinesio tape to the anterior thigh has no effect on muscle strength either immediately after application or 12 hours later.^[11]

These results are in line with earlier studies. The plausible reasons for increase in knee range and decrease in pain intensity in our study could be due to the stimulation of neuromuscular pathways via increased afferent feedback. Other reason for increase motion could be due to the increase in quadriceps motor units recruited to perform the activity due to increased proprioception stimulus. And lastly, increase in range of motion could be due to the reduced mechanical irritation of the involved soft tissues. Another reason for limited range of motion could be due to fear of movement associated with pain, kinesio tape provides sensory feedback to the patient thus decreasing the fear of movement and increase in the range of motion. Placebo can also have an effect on the reduction of pain and increase in range of motion^[12,13,14] determining the exact mechanism by which kinesio taping works is beyond the scope of this study.



Conclusion -

Use of kinesiotape is definitely beneficial in case of malunited supracondylar fracture and stiffness in terms of improving knee range of motion, while in case of improving strength and decreasing pain combined factors of supplementary treatment can be effective.

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Conflict of Interest : The author's report no conflict of interest

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