Changes in the Volume of the Peripheral Blood Flow by using Kinesio Taping®

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PURPOSE

For the treatment of injuries, increasing the amount of blood flow is one of the mechanisms in the healing process. This is a clinical study based on 9 subjects using a Doppler machine to measure the volume changes of the peripheral blood flow before and after applying Kinesio Taping® Methods.

PROCEDURES

The subjects were chosen at random. Five subjects had chronic disorders and poor circulation, and four subjects were relatively healthy. There were different areas chosen where the subjects volumeof the peripheral blood flow were measured by Doppler. Based on the area being measured, KinesioTaping® was applied to the areas most likely to affect blood circulation. For example, if the volume was being measured at the radial artery, the pectoralis major muscle had been taped. If the dorsal artery of the foot was measured, mainly the gastrocnimeus muscle was taped with the popliteus fossa being taped as well due to the positive results seen. For the superficial temporal artery, the sternocleidomastoid muscle was taped. The volume of the peripheral blood flow was first measuredbefore the Kinesio Tape® was applied. After recording the results, Kinesio Taping® was applied andthe volume was measured immediately (approx. 10 min.) to see if changes in the volume flow was occurring.The pectoralis major muscle was chosen for theprocedure measuring the volume in the radial artery by observing the following outcome graphs. Before Taping (A-1) Pectoralis Major (B-2)

The first graph (A-1) represents measurements before Kinesio Taping® was applied for subject #1, 13.2 cm/s is the peripheral blood flow volume (VPK), the average volume of the peak volume(FPK) and the lowest volume(FMN). The major muscles that are involved in the flow to the radial artery are the pectoralis major, pectoralis minor, and the anterior and medial scalenus. Blood vessels go through the scalene space between the anterior and medial scalenus. By applying Kinesio Tape® over the anterior and medial scalenus, it will relieve the tension which will decrease the pressure off of the axillary artery. The pectoralis minor attaches to the upper region of the precordialwhich applies pressure to the axillary artery. The pectoralis major is a more superficial muscle whichinserts to the greater tubercle crest of the humerus and which will also apply pressure to the axillary artery. By applying Kinesio Tape® from the insertion to the origin of these two muscles, it will help avoid the pressure which is placed to the axillary artery that is caused by isometric contraction. Results for effective Kinesio Taping® can be observed when there are convulsions on the skin created by the tape.

Comparing the results for these three muscles that were involved, the pectoralis major muscle measured 33.6cm/s (B-2), an approximate of 60% increase. The pectoralis minor muscle measured 18.9cm/s (B-3), an approximate of 30% increase. And the anterior and

medial scalenus muscle measured 16.7cm/s (B-4), which is approximately 20% increase of the peripheral blood flow volume. Based on these results, the most effective muscle, the pectoralis major was taped to measure the volume change of the radial artery. This same procedure was applied to the muscles that affected different arteries used for the other subjects, and Kinesio Taping® was applied to the most effective muscle to measure the changes of the peripheral blood flow volume for each arteries.

RESULTS

Subject # 1, was a 38 year old female who complained of constant pain, tingling and swelling in both of her upper extremities. The volume of blood flow at the right radial artery before applying Kinesio Tape® was 13.2cm/s. After applying Kinesio Tape®® to the right pectoralis major(C-1), the volume of blood flow increased to 33.6cm/s. A 60.7% increase change was seen in the volume of the blood flow to the right radial artery.

Subject # 4, a 24-year-old female and subject # 5, a 72-year-old male both suffer from chronic patella tendinitis.

Subject # 8, a 87 year old female has deformans osteoarthritis in the knee. All three subjects have difficulty in walking. For subjects #4 and #5, Kinesio Tape® was applied to the right gastrocnemius muscle (C-2).

For subject #4, the volume changed from 14.9cm/s to 20.9cm/s a 28.7% increase. For subject #5, the volume changed from 38.8cm/s to 46.8cm/s a 20.6% increase. For subject #8, Kinesio Tape® was applied to his right popliteus fossa muscle (C-3), and the volume changed from Pectoralis Minor (B-3)
Ant. &Med. Scalenus (B-4) 29.2cm/s to 46.2cm/s, for a 58.2% increase.

For subject #9, a 55-year-old male who suffers with hypertension and complains of a constant headache, Kinesio Tape® was applied to the sternocleidomastoid (C-4). The volume changed from 13.3cm/s to 19.9cm/s a 45.8% increase at the superficial temporal artery. As one can observe from the results from the chart (D-1), subjects that suffer with disorders have a extremely high increase in their volume of peripheral blood flow after applying Kinesio Taping®.

Though as seen in subjects like #2, a 24 year old healthy female that has no complaints of any existing physical disorders, the volume of blood flow at the right radial artery before applying Kinesio Tape® was 25.5cm/s. After applying Kinesio Tape® to the right pectoralis major, the volume of blood flow decreases to 24.1cm/s. There is a -5.4% decrease in the volume of blood flow, which means there are hardly any relative changes in the volume of blood flow. This same kind of results are seen in every healthy patient, such as subject #3, #6, and #7. There were no significant changes in the peripheral blood flow after Kinesio Tape® was applied to healthy subjects

(D-1) Peripheral Blood Flow Volume Change

No.	Age/Sex	Part of Measure	Part of Taping	Before Taping (cm/s)	After Taping (cm/s)	Rate of Change(%)
1	38/F	Right Radial Artery	Pectoralis Major	13.2	33.6	60.7
2	24/F	Right Radial Artery	Pectoralis Major	25.5	24.1	−5.4
3	36/M	Left Radial Artery	Pectoralis Major	44.3	43.0	−2.9
4	24/F	Right Dorsalis Pedis Artery	Gastrocnemius	14.9	20.9	28.7
5	72/M	Right Dorsalis Pedis Artery	Gastrocnemius	38.8	46.8	20.6
6	26/F	Right Dorsalis Pedis Artery	Gastrocnemius	26.7	25.9	−2.9
7	20/F	Right Dorsalis Pedis Artery	Gastrocnemius	41.7	39.4	−5.5

8 87/F Right Dorsalis Pedis Artery Popliteus Fossa 29.2 46.2 58.2
9 55/M Superficial Temporal Artery Sternocleidomastoid 13.1 19.9 45.8
Pec. Major Tape (C-1)
Gast)roc Tape (C-2)
Sternocleido. tape Popliteus fossa tape (C-3)

CONCLUSIONS

Based on the results, applying Kinesio Tape® was effective in changing the volume of the peripheral blood flow for subjects that had physical disorders. The result of this research suggests that Kinesio Taping® causes the alternation of the blood flow. By applying Kinesio Taping® techniques, an immediate effect is seen since the blood flow has been changed immediately (within 10 min.) after taping. Probably more importantly, the result that we were able to gather from this study was that, since the Doppler indicated no major changes in the healthy subjects blood flow after taping, we can say with some confidence that Kinesio Taping® has no major adverse effects.