KINESIO TAPE: A COMPLEMENTARY TREATMENT FOR PAIN DUE TO STERNOTOMY AFTER CARDIAC SURGERY?

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In cardiology rehabilitation, after sternotomy, there are unknown data concerning the pertinency and the related benefits of KT.

After heart surgery an important pain is frequently highlighted in the anterior and posterior thoracic venue and in the shoulder girdle.

For this reason painkillers are often used for a long period of time.
Aim of the study

Evaluate Kinesio Tape (KT) effectiveness during the treatment of painful symptomatology after cardiac surgery (sternotomy)
The study has been conducted from May to September 2011, in the Department of Cardiology and Cardiovascular Intensive Rehabilitation at Multimedica Institute in Castellanza (Varese, Italy)
Subjects

- 38 patients after heart surgery
- Characteristics:
  - sternotomic injury
  - pain
  - physical deconditioning
  - enticement
  - reduction of physical skills and activities daily living (ADL)
  - comorbidity (diabetes, hypertension, hypercholesterolemia, ecc...)
Two groups:
1. experimental group (EG)
2. control group (CG)
Inclusion criteria

- 30-75 years old
- Activity daily living autonomy
- Cardio-circulatory compensation
- Rehabilitation program compliance
Exclusion criteria

- Age > 75 anni or < 30
- Hemodynamic instability
- Sternum instability
- Cutaneous dehiscence of the injury
- Septic condition
- Oncological comorbidity
- Slipped disc
- Senile dementia
Subjects

1. Experimental group (19 pt)
   - progressive training of multiple-districts segmentary mobilization exercises
   - KT applications

2. Control group (19 pt)
   - progressive training of multiple-districts segmentary mobilization exercises
1. First 10 days
   - lymphatic correction
     10% tension (anterior and posterior)
   → standard
KT application

2. Second 10 days
   - diaphragm stimulation
     - tension in the middle
     - 30% tension
     - anterior and posterior
     - standard
   - fascial correction
     - Y tape tension in the tails
     - 20% tension
     - long and short
     - symptom related
Rehabilitation program

- Aerobic training (cyclette, treadmill,...)
- Global mobilization exercises

The program is divided into three levels:

1. exercises in sitting position
2. standing position exercises + weight lifting
3. exercises during walking + weight lifting
Rehabilitation program

Exercises in sitting position
Rehabilitation program

Standing position exercises + weight lifting
Rehabilitation program

Exercises during walking + weight lifting
This program has been submitted to all patients but not all of them have been able to perform the exercises at the last step.
Materials and methods

Testing procedure:

- pain intensity evaluation using the Visual Analogic Scale (VAS) and benefit's subjective perception through EuroQol Visual Scale:
  - $T_0$ at the start of the degenza
  - $T_1$ in the middle of the degenza
  - $T_2$ at the end of the degenza
Outcomes

- **VAS**

- **Validation of the EQ-5D in patients with a history of acute coronary syndrome**
  Ellis JJ, Eagle KA, Kline-Rogers EM, Erikson SR.

- **Is a single-item Visual Analogue Scale as valid, reliable and responsive as multi-item scales in measuring quality of life?**
  De Boer AG, Van Lanschot JJ, Stalmeier PF, Van Sandick JW, Hulscher JB, De Haes JC, Sprangers MA
Outcomes

- EuroQol

- EuroQol-5D FOR quality of life assessment in cardiac rehabilitation
  Balestroni G, Omarini G, Omarini P, Zotti AM

- Validation of the EuroQol questionnaire in cardiac rehabilitation
  Schweikert B, Hahmann H, Leidl R
Outcomes

Visual Analogic Scale
Pain assessment

EuroQol
Quality of Life assessment
# Results

<table>
<thead>
<tr>
<th></th>
<th>Experimental group</th>
<th>Control group</th>
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<tbody>
<tr>
<td><strong>Age</strong></td>
<td>mean</td>
<td>66.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td><strong>VAS</strong></td>
<td>$T_0$ mean</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>$T_1$ mean</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>$T_2$ mean</td>
<td>0.3</td>
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<tr>
<td></td>
<td></td>
<td>5.8</td>
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<tr>
<td></td>
<td></td>
<td>3.1</td>
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<tr>
<td></td>
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<td>p&lt;0.05</td>
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<td></td>
<td></td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td><strong>EuroQol</strong></td>
<td>$T_0$ mean</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>$T_2$ mean</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>55.4</td>
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<tr>
<td></td>
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<td>p&lt;0.05</td>
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**VAS analysis**

<table>
<thead>
<tr>
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<th>T0 mean</th>
<th>T1 mean</th>
<th>T2 mean</th>
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<tbody>
<tr>
<td><strong>EG</strong></td>
<td>7,3</td>
<td>2,4</td>
<td>0,3</td>
</tr>
<tr>
<td><strong>CG</strong></td>
<td>7,4</td>
<td>5,8</td>
<td>3,1</td>
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\[ p < 0.05 \]
**EuroQol analysis**

![Graph comparing EuroQol scores](image)

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</table>

\( p < 0.05 \)
Results

Both EG and CG showed an improvement of symptomatology in $T_2$, however, only the 37% in EG needed an analgesic therapy for the average time of 2 days, while in CG the 95% for about 6.5 days.

$p < 0.05$
**Conclusions**

- Despite the small number of patients, this study demonstrated the statistical significance of KT application in order to:
  - decrease sternotomy’s pain
  - increase soggettive perception improvement of benefits
Conclusions

This study has demonstrated the effectiveness of KT in order to reduce painkillers intake in patients that are overloaded by pharmacological treatment due to comorbidities.
In order to answer at the first question of this study:

*Is KT a complementary treatment for pain due to sternotomy after cardiac surgery?*

At the end of this study we can say that KT should be considered a complementary treatment in cardiac rehabilitation setting.
Thank you for your attention