Clinical Cases and Applications

Baropodometria
Stabilometria
Biofeedback
Goniometria
Videografica morfologica
Notes:

- Women
- 12 years old
- Bilateral pronation and foot intrarotation
- Poor dynamic motion control
- No pain
Case 1

Dynamic Analysis PRE

Test: 1/5
Durata: 1923 ms
Faee: 68

Piede Destro
Superficie: 54 cm²

Piede Sinistro
Superficie: 54 cm²
Case 1

Dynamic Analysis POST

Test: 1/4
Durata: 2063ms
Fase: 63
Case 1

Treatment:
- Insole with medial heel wedge and anatomical arch support
- Proprioceptive foot and walking exercises
Case 2

Notes:
- Male
- 17 years old
- Professional basketball player
- Ankle sprain (inversion) during landing on left foot
- Edema and irritation peroneal and tibialis posterioris tendons
- Pain during motion and during manual muscle test for peroneal muscles
- Rearfoot pronation
- Forefoot supination
- Jacktest positive
Case 2
Dynamic Analysis

Test: 4/8
Durata: 2840ms
Fasi: 307
Case 2
Static analysis
### Monopodalic Stability Test

#### Case 2

#### Results:

<table>
<thead>
<tr>
<th>Left Knee extended - 10 sec.</th>
<th>Right Knee extended - 10 sec.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numerical values</strong></td>
<td></td>
</tr>
<tr>
<td>Sway length mm</td>
<td>Sway length mm</td>
</tr>
<tr>
<td>Ellipse surface mm²</td>
<td>Ellipse surface mm²</td>
</tr>
<tr>
<td>Ellipse inclination (°)</td>
<td>Ellipse inclination (°)</td>
</tr>
<tr>
<td>Ellipse eccentricity (°)</td>
<td>Ellipse eccentricity (°)</td>
</tr>
<tr>
<td>LjS ratio</td>
<td>LjS ratio</td>
</tr>
<tr>
<td>Delta X mm</td>
<td>Delta X mm</td>
</tr>
<tr>
<td>Delta Y mm</td>
<td>Delta Y mm</td>
</tr>
<tr>
<td>Major axis mm</td>
<td>Major axis mm</td>
</tr>
<tr>
<td>Minor axis mm</td>
<td>Minor axis mm</td>
</tr>
<tr>
<td>Max oscillation mm</td>
<td>Max oscillation mm</td>
</tr>
<tr>
<td>Min oscillation mm</td>
<td>Min oscillation mm</td>
</tr>
</tbody>
</table>

#### Romberg Index:

- **Ellipse surface mm²:** 52
- **Average speed:** 78
- **Sway length:** 81

#### Notes:

- [www.sensormedica.com](http://www.sensormedica.com)

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**Graphs and Charts:**

- LjS Oscillations
- Anterior
- Posterior
Case 2

Treatment:
- Custom orthotic with deep heel cup, heel lift, medial heel wedge (rearfoot inversion), anatomical arch support and lateral forefoot wedge (forefoot eversion)
- Proprioceptive and strengthening foot and ankle exercises
Case 3

Notes:
• Female
• 47 years old
• Amateur runner
• 3 surgical interventions for left hallux valgus and correction of metatarsal alignment.
• Pain during motion and altered gait
RX views

Case 3
Case 3

Dynamic analysis

Test: 3/11
Duration: 1469 ms
Frames: 183
Case 3

Static analysis
Treatment:
- Custom orthotic with a slight heel lift, little lateral heel wedge (rearfoot eversion), anatomical arch support, Morton extension (soft material) for left foot.
Notes:
bullet Female
bullet 13 years old
bullet Gymnastic athlete
bullet Multiple ankle sprains on left foot
bullet No pain
Case 4

Dynamic analysis

Test: 1/4
Duration: 659ms
Frames: 36

Test: 2/4
Duration: 599ms
Frames: 32

Test: 3/4
Duration: 666ms
Frames: 73

Test: 4/4
Duration: 660ms
Frames: 54

Left foot
Surface: 30 cm²

Right foot
Surface: 38 cm²
Case 4

Dynamic test with in-shoe sensor insoles
Static Analysis

Case 4
Case 4

Monopodalic Stability Test

- Numerical values:
  - Left Knee extended - 10 sec.
    - Sway length mm: 914.44
    - Ellipse surface mm²: 728.57
    - Ellipse inclination °: 53
    - Ellipse eccentricity*: 0.26
    - L/S ratio: 0.71
    - Delta X mm: 20.59
    - Delta Y mm: 31.20
    - Major axis mm: 30.96
    - Minor axis mm: 29.96
    - Max oscillation mm: 5.09
    - Min oscillation mm: 0.03

- Right Knee extended - 10 sec.
  - Sway length mm: 776.54
  - Ellipse surface mm²: 408.52
  - Ellipse inclination °: 124
  - Ellipse eccentricity*: 0.96
  - L/S ratio: 1.90
  - Delta X mm: 17.32
  - Delta Y mm: 32.31
  - Major axis mm: 25.07
  - Minor axis mm: 20.75
  - Max oscillation mm: 147.26
  - Min oscillation mm: 0.02

- Romberg Index:
  - Ellipse surface mm²: 56
  - Average speed: 123
  - Sway length: 151
Treatment:
Intrinsic foot muscles strengthening exercises and stability exercises.
Notes:
• Female
• 58 years old
• Heel pain, no heel spur or plantar fasciitis
Case 5

RX views
Case 5

Static Analysis
Treatment:
- Heel cup and offload with soft material, anatomical arch support, metatarsal pad and slight forefoot lateral wedge
Notes:
• Female
• 44 years old
• Rearfoot pain due to a talo-calcaneal ligament injury
Case 6

MRI view
Dynamic Analysis

Case 6

Test: 8/8
Duration: 2939ms
Frames: 453
Case 6

Static analysis
Case 6

Dynamic exam with elastic taping application left ankle

Test: 5/7
Duration: 1729ms
Frames: 258
Case 6

Treatment:
• Taping and ankle stabilization
• Orthotic with heel cup and stabilization, soft material, anatomical arch, metatarsal pad
CASE STUDY / PRACTICAL APPLICATION

Assistance in return-to-play decisions. In this case a football players suffering from an injury in quadriceps muscle of the right leg, still isn’t able to return to play as clearly showed by CoP lateralization on the right foot.
CASE STUDY / PRACTICAL APPLICATION
Checking how different shoes can affect overall stability, weight distribution, pressure zones and biomechanics.
The pictures below show the same player with two different types of shoes influencing the overall weight distribution as well as hip rotation.
CASE STUDY / PRACTICAL APPLICATION

The 1st picture shows a player with no orthotics; you can see the asymmetry in the rearfoot curves as well as in the CoP progression (late starting point in the left foot).

The 2nd picture on the right shows the same player after wearing custom orthotics; you can see the improvement in symmetry in the rearfoot curves as well as in the CoP progression (normal starting point in the left foot).
Thank you for your attention

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