#ITFWCC

2019
25-27 OCTOBER
BANGKOK, THAILAND

ITF Worldwide Coaches Conference
by BNP Paribas

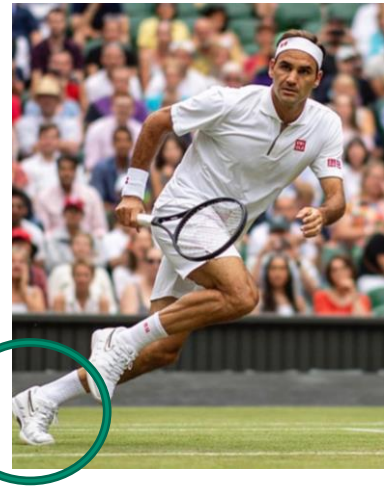
Beni Linder

The importance of foot strength and foot reactivity

Swiss Tennis

WORKSHOP PRESENTATION

Importance of foot force & reactivity



While stopping / sliding

While accelerating

While adapting to the ball

Biomechanically: to be fast …

Sprint biomechanics:

- Length of your stride
- Frequency
- Contact time on the ground

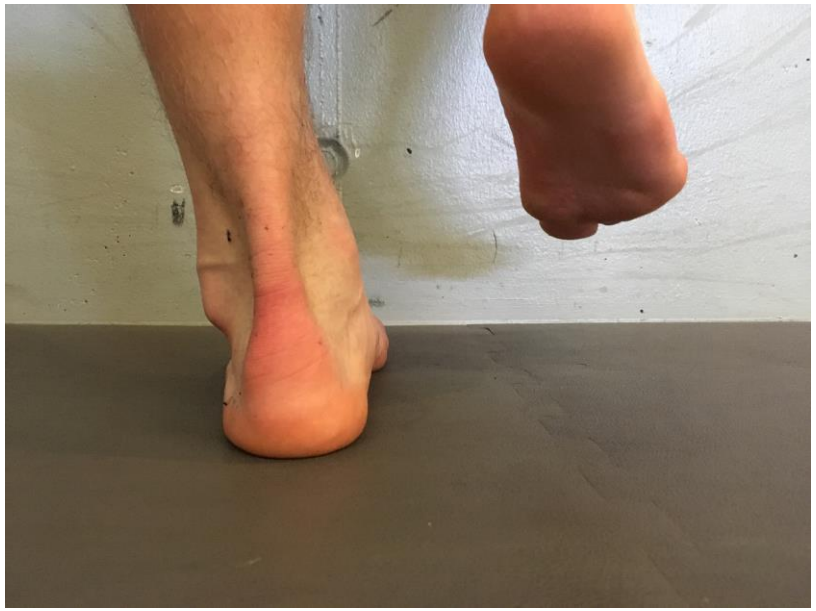
Contact time on the ground:

- Reactivity / Stiffness
- Force in the foot
- Hight of the jump

The feet

- There are more sensory cells in our feet than in our face.
- (… reflex zones)

- Our feet are impressively complex. Almost 30 bones, almost 30 joints, 60 muscles, more than 100 ligaments and over 200 tendons make it a “sophisticated masterpiece”.



Role of the feet in sport

- The only contact point between the body and the ground is the foot!!
- As a consequence, the foot is the first part of the body that initiates the acceleration of any movement (counterforce to the ground)
- The muscular tone in our body allows the counterforce from the ground to be more effectively used, only when stability is present between the foot and the torso.
- The foot also absorbs the information (sensory cells) from the floor/shoe on a neuro-athletic basis and sends it to the central nervous system (CNS).
- The CNS then sends information back to the foot (muscles, tendons, etc.) → so action can happen

Role of the feet in Tennis

In athletic tennis

- Effectiveness
- Efficiency
- Economy

start in the feet

Reactivity in Tennis: sport science

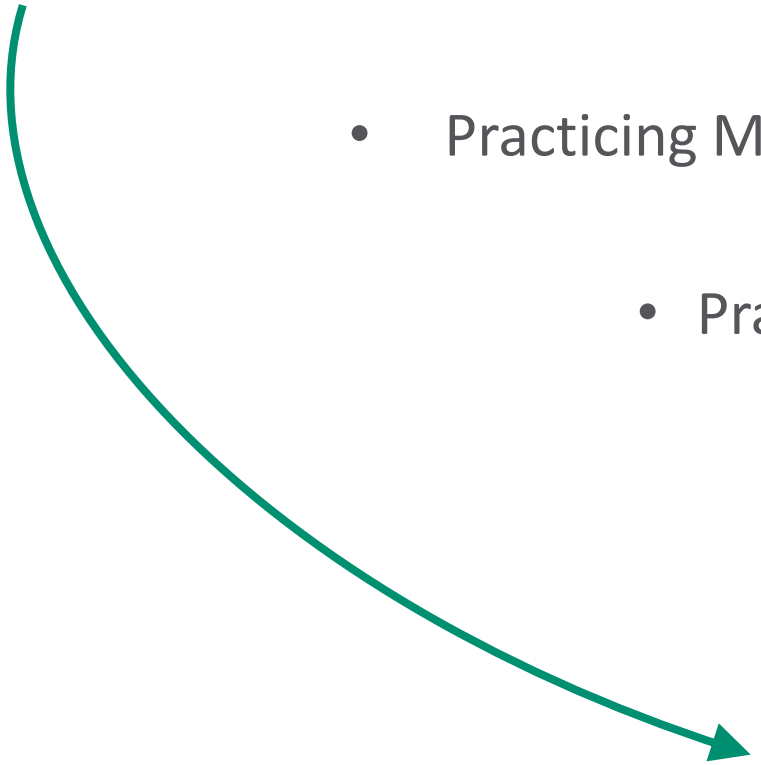
During the short time of a rally, agility, timing and precision as well as reactivity and speed combined with about 4.5 change of direction determine success or failure.

- **Relationship Achilles tendon and ground contact time during drop jumps**; *M. Abdelsattar et. al.; Journal of Sport Sciences and Medicine; 2018)*
  - A short ground contact time is required in several types of sport. Therefore a stiff Achilles tendon might be advantageous due to the quick force transmission from the muscles to the bone. **The results of the study shows a correlation between ground contact time and Achilles tendon stiffness.**

- **Relationship between split-step timing and leg stiffness when returning fast services**; *Sami Mecheri et. al; Journal of Sport Sciences; 2019:*
  - **The study states that elite players have higher foot stiffness and better reactivity than other players.**
    - The hypothesis now is: whether elite players can also wait a little longer to initiate their split-step in order to absorb more relevant information and move accordingly more effectively and more purposefully on return ???

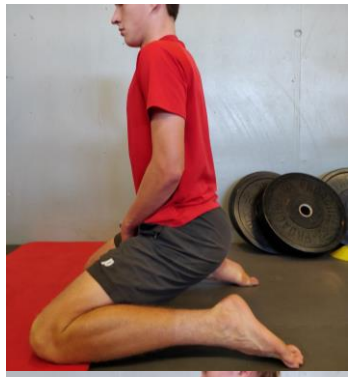
Foot – Concept

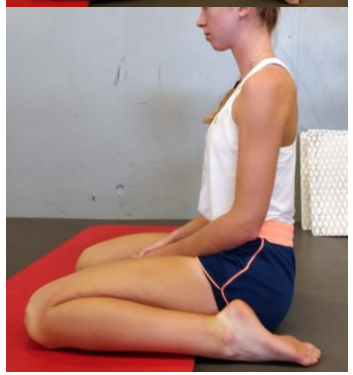
- Testing: Mobility and Performance
  - Practicing Mobility
    - Practicing Strength
      - Transfer into non-specific training
      - Transfer into Tennis oriented training



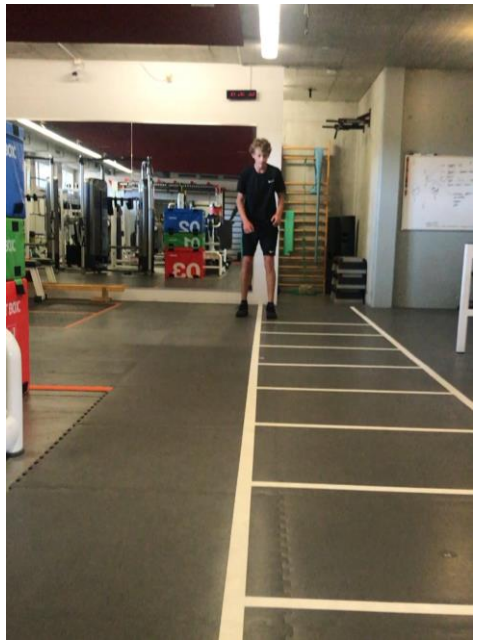
Examples for Testing:

Mobility



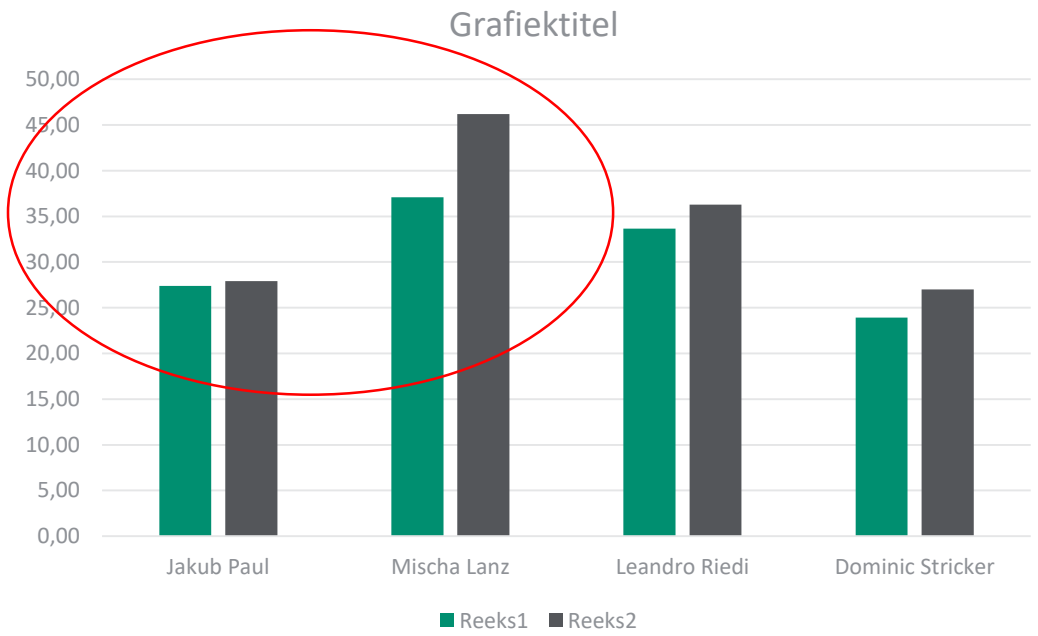


Performance

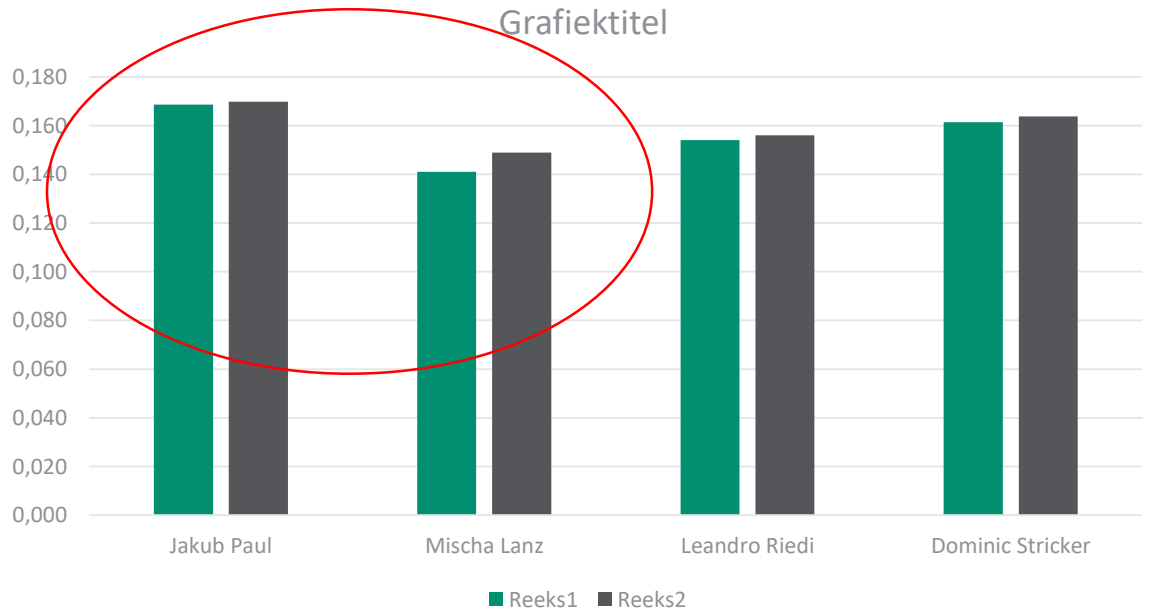


Performance: Drop Jump 20 cm / 40 cm

height



contact time



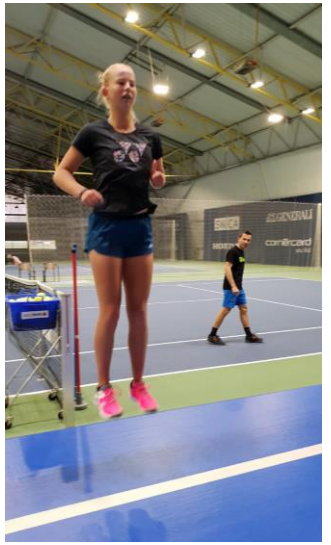
Examples for Mobility

Examples for Strengthening

Barefoot training should be included in most warm-ups and explosive training sessions.

Non-specific performance training

strength power



reactivity

proprioception

reactivity lateral

Non-specific performance training:

Backward Running
The Why and How to Program for Better Athleticism
Strength & Conditioning Journal; Oct. 2019

lateral / change of direction / linear

Tennis oriented performance training

Lower complexity

Tennis oriented movements / specific
→ focus on foot activity
→ reactivity on the first steps

Higher complexity

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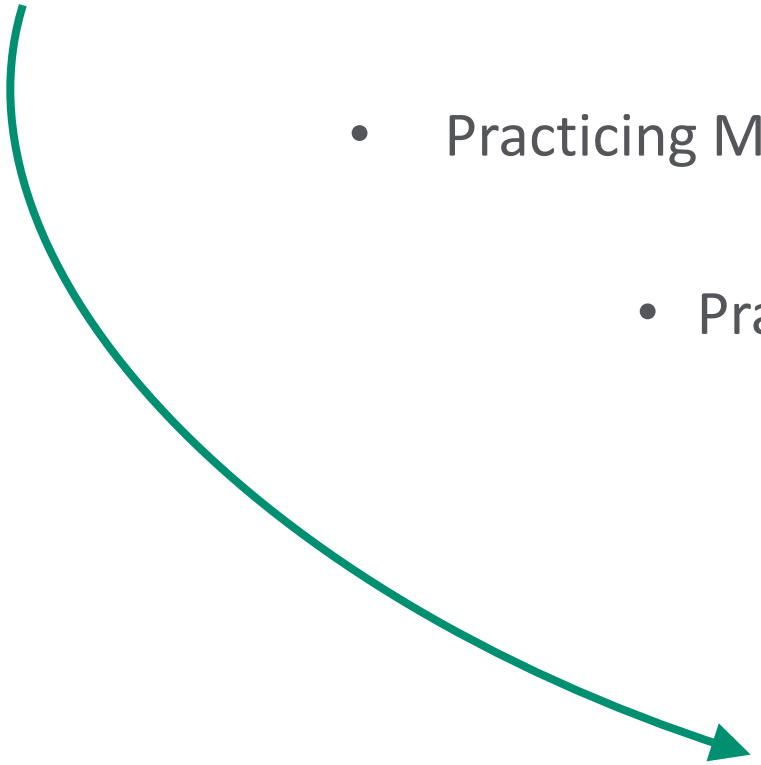

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Thank you for your attention!

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