

**Le TENDON**

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**ENGLISH VERSION**

**THE EFFECT OF RETRACTION OF THE GASTROCNEMIUS MUSCLES ON  
POSTURE AND WALKING AMONG 18 PROFESSIONAL GOLFERS**

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**Introduction**

Using 18 golfers, either professionals or scratch player, an analysis of podal pressure by Foot Scan<sup>®</sup> software carried in the soles was carried out both when the golfers were walking and when they were stationary, in the course of a study dealing with the effect of the LPG System<sup>®</sup> following an intermittent isometric test<sup>(1)</sup> on motor recovery and golfing performance. The alignment of the back of the foot formed the subject of a clinical study in accordance with the three following protocols: before the fatigue test, after the fatigue test and after LPG treatment.

The tension of the gastrocnemius was evaluated by measuring the dorsiflexion of the foot with the knee extended.

A De Fonseca test was performed so as to be sure of the normal dynamics of the rear of the foot.

Morphological type of the rear of the foot:

- 10 presented a calcanean valgus 4.00° av. (max 7°- min 3°)
- 17 presented a calcanean varus 8 ° av. (max 7°- min 3°)
- 9 were neutral ( +/- 2° )

Dorsal flexion of the ankle:

- 8 subjects tended to retract the gastrocnemius (average dorsal flexion 17°).

All of the subjects tended to retract the gastrocnemius to a lesser extent after the fatigue test (Average decrease 9.98°).

Every calcaneum was dynamic under the De Fonseca test, which confirmed normal articular functioning of the rear of the foot.

**Results**

**A – The subjects whose ankle flexion was normal fell into 2 subgroups:**

- Calcanean varus cases presenting lateral calcanean pressure peaks after fatigue migrate to the medial part, and then after LPG treatment revert laterally but the values measured were lower than they were initially.
- The calcanean valgus cases, however, presented immediately medial pressure peaks which migrated laterally to the point of being lateralised after LPG treatment.

**B – The subjects whose gastrocnemius showed a tendency to retract presented different characteristics:**

- The anteroposterior oscillations along the line of force, whilst static were greater after the fatigue test.
- The LPG<sup>®</sup> treatment, acting on the posterior muscles of the lower limb, more especially on the gastrocnemius, significantly reduced the rebalancing oscillations, particularly at the knee.
- All the heel support peaks when walking were lateralised. They migrated towards the calcanean centre as a result of fatigue, then returned to their initial position after LPG treatment.<sup>(1)</sup>
- After LPG treatment, when walking, pressure on the first phalanx of the hallux (T1) increased.

**C- In every case**

- With fatigue, the gastrocnemius retracted to varying extents among the golfers (dorsal flexion of the foot was limited to 5° on average).
- After LPG treatment, T1 pressure peaks increased. Recovery of the effectiveness of the flexor hallucis longus could also account for the lateralisation of the heel pressure peaks through its varus effect on the calcaneum

**Conclusion**

This study of a homogeneous group of sportsmen revealed no pathology of the foot (they were therefore considered to be normal) but did show that many of them (40%) exhibited a tendency to retract the gastrocnemius. This is entirely in agreement with V. Kowalski's findings.

Among these subjects, retraction was not due to any pathological cause. It is also noteworthy that fatigue causes the gastrocnemius to retract.

This phenomenon should be systematically tested on everyone, and especially on sportsmen, as it can be treated simply and effectively on a tilting table.

(1) In overall terms, for each subject with higher than 80% of maximum cardiac rate for 25 minutes.