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KINEMATIC DISORDERS IN GOLF SWING AFFECTED BY FATIGUE AND THE ROLE OF AN ORIGINAL TREATMENT INVOLVING TISSUE MECHANISATION AND MUSCULAR RE-COORDINATION

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Introduction

This study examined the following:

- the effect of fatigue on top-level golfers, and more especially the kinematic parameters affected;
- the role of an original tissue mechanisation treatment used following fatigue (under a treatment protocol derived from current procedures applied by the PGA European Tour Physio Unit) so as to determine if it is possible to re-coordinate movement.

This study was carried out on 18 golfers, either professionals or scratch player. A morphostatic study of the lower limbs and feet (alignment of the Back foot and retraction of the gastrocnemius in particular) was carried out. After analysing the individual's normal swing, an intermittent isometric fatigue test was conducted in order to exhaust the muscular chains exerted in the swing, and then the kinematic analysis was resumed. Lastly, LPG treatment was applied, and a further analysis performed. Postural oscillations were analysed prior to each kinematic analysis. Each player was analysed on the basis of two trajectories: the easiest and the most difficult to control. Kinematic analysis was carried out on 4 target joints: the left shoulder, the right knee, the hips and wrists. The movement, speed and acceleration of these 4 joints was examined, first segmentally and then overall for the shoulders and hips (Hips & shoulder dissociation studies). A statistical analysis was carried out.

Results

As regards the segmental study, 20 kinematic factors revealed a significant difference in movement "before the fatigue test" and "after the LPG treatment", compared with the swing "after the fatigue test".

Performance was also examined, and here again the successful drives were significantly correlated with the "pre-fatigue" state and the "post-LPG treatment" state.

As regards Hips & shoulder dissociation, fatigue affected swing insofar as it inhibited dissociation between the shoulders and the hips on the down swing.

Conclusion

Fatigue and muscle retraction go hand in hand:

Movement is affected (Segmental Kinematic Analysis + Analysis of the Dissociation between Hips & Shoulders significantly different depending first on the "pre-fatigue" and "post-LPG treatment" protocols and secondly on the "post-fatigue test" protocol.

Postural control was no longer optimum (Oscillations).

Starting and continuing the swing appeared to depend on the postural stability of the golfer on the address. And everything depends on optimum neuromuscular functions.

Recovery of the normal functioning of the muscular unit would appear to be a major factor (overall performance the same as at the start), as shown by the reduced movement recovery time following LPG treatment.