240. THE ROLE OF THE PRONATOR TERES MUSCLE IN THE ARM DURING THE ROWING MOVEMENT, AT THE END OF THE STROKE

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While biomechanical registrations of the rowing movement were recently published (1), more functional anatomical analyses of rowing movements remain relatively scarce.

The present study therefore concentrates on rotational motions in shoulder and elbow, with respect to upper and lower arm, namely humerus, ulna and radius respectively, and the role of pronator muscles during the movements of the radius in the lower arm.

Rowing consists of cyclic movements, performed by oarsmen, each of their strokes alternated by subsequent recovery phases. During a stroke from catch on, the pulling phase starts with extended arms in which shoulders are in anteflexion and elbows in extension. Thereby the humerus of the upper arm is in medial rotation, while in the lower arm radius and ulna are relatively parallel to each other - this is called "supination".

From about halfway the pulling phase until the finish of the stroke, the shoulders move to retroflexion and elbows are flexed. Meanwhile, the humerus of the upper arm goes to lateral rotation, coupled to the crossing of the radius over the ulna in the lower arm - this is called "pronation". The question arises, which of the pronator muscles contributes to this pronation (Figure 1).

Our current research focuses on the anatomical features of the pronator teres muscle, investigated in normal human anatomical specimens by means of dissection, morphometry and roentgenphotogrammetry (2).

Humeral and ulnar heads of *m. pronator teres* fuse, their common tendon inserting on the *tuberositas pronatoria* of the radius. Mathematical vector analysis of forces indicates that the effective contribution of *m. pronator teres* to pronation of the forearm may be considered as somewhat limited. An important vector of the pronator teres muscle contributes to elbow flexion.

Strong pronation can be produced by a deep muscle of the forearm, *m. pronator quadratus* (3).

Finally our analysis indicates, that functional anatomy can be used to elucidate possible active insufficiencies of muscles during sports.

References

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Figure 1. Typical picture of a rowing team, at the end of a stroke

(Photograph from www.oud-asoposdevliet.nl, of which the second author currently is a member)

(From the Proceedings of the 2nd International Congres on "Sport and Health" 21-23 April, 2005, St. Petersburg, Russia, under the auspices of the Secretary General of the Council of Europe, Mr. Terry Davis, p. 358-359, ISBN 5 - 94988 - 012 - 9)