

Hamstring electromyographic activation according to 30 rehabilitation knee exercises

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Keywords: Hamstring; Rehabilitation; Electromyography; Knee

Objective.— To quantify the hamstring activation according to various rehabilitation exercises used to control the knee.

Method.— Fifteen healthy subjects, 22.8 ± 3 years old, were evaluated on the thigh to quantify the electrical activity of hamstring muscles and the quadriceps when performing 30 rehabilitation exercises. Various functional exercises of walking, standing, sitting position, and analytic hamstring exercises according to isometric and eccentric contractions were studied.

Results.— After signal processing, results were expressed according to the area by second (μvolt/s) of the RMS (Root-Mean-Square) to organize an exercise hierarchy according to the intensity of hamstring activation. The exercises performed in the sitting position and the functional exercises weakly activated hamstring muscles in contrast with the eccentric and isometric analytical exercises.

Discussion.— The functional exercises studied can be proposed very early to control the knee. However, they are by consequence weakly effective to restore hamstring muscular strength. Analytical exercises should be integrated into the program of rehabilitation but later if these must be performed after knee trauma or knee surgery.

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Muscular strength recovery after revision knee ligamentoplasty

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Keywords: Isokinetic; Anterior Cruciate Ligament; Revision

Objective.— To measure the knee isokinetic strength recovery after a revision of an anterior cruciate ligament reconstruction.

Method.— Thirty-nine revisions (23 by hamstring procedure [STG], 10 by ipsilateral patellar tendon procedure [iPT] and 6 by contralateral patellar tendon procedure [cPT] were compared with 78 primary plasties [46 STG and 32 PT procedures]). The recovery of the muscular strength was measured at 4, 6 and 12 months post-surgery.

Results.— The strength deficit at 12 months post-surgery after revision was comparable with that of a primary ligamentoplasty performed according to the same procedure. On the other hand, at 4 and 6 months post-surgery, the extensors deficit was lesser after the hamstring procedure revision (25% ± 16 vs 37% ± 16; $P < 0.001$) and after the iPT procedure revision (41% ± 11 vs 17% ± 17; $P < 0.001$).

Discussion.— Our results at 12 months post-surgery are comparable with those observed during cohort cross sectional studies with a long follow-up. The weak extensors deficit after the STG procedure can be explained by a program of rehabilitation which was less intense because of lesser challenge to recover sports activity. For the cPT procedure, the weak extensors deficit is explained by a knee graft deficit which persists at least until 6 months post-surgery.

evaluated after the primary ligamentoplasties using the same surgical procedure.

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Support resumption by table tennis practice after knee ligamentoplastie

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Keywords: Proprioception; Knee; Ligamentoplastie; Rehabilitation; Sport

Objective.— To quantify the support on the operated lower limb with a force platform during the practice of table tennis and to study the effect of this physical activity on premature restoration of support after knee ligamentoplasty.

Subjects.— The movements of the centre of pressure (average position [x, y], lengths and surface) of 40 subjects operated at the level of the knee were measured when playing table tennis. A comparison with a control group of 20 non-operated subjects was studied to quantify the support. Then, operated subjects were randomized according to practice or not of controlled table tennis training (10 sessions of 15 minutes for 5 days) to determine whether this physical activity was interesting to restore the support of the operated lower limb.

Results.— Operated subjects for the knee presented a defect of support of the operated side compared with non-operated subjects during table tennis practice. Training by table tennis practice improved significantly the lateral and the total movements of the centre of pressure of operated subjects even though the values of non-operated subjects had not been achieved.

Discussion.— Reconstruction of the knee anterior cruciate ligament leads to a defect of support which a force platform coupled with the standardized table tennis practice is capable of quantifying. Tennis tables training for one week improves the support of the operated lower limb and the lateral and total mobility of the subject. This physical activity can be associated with the accelerated rehabilitation program proposed after ligamentoplasty.

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Kinematics during a sidestep manoeuvre in handball: Study of the influence of gender

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Keywords: Anterior cruciate ligament; Biomechanics; Direction change; Sport; Handball; Gender

Introduction.— Anterior cruciate ligament (ACL) tear is a common injury in handball with a risk 3–5 times higher among women [1]. The sidestep manoeuvre

is a specific technique movement in handball with a change of direction. It is the main circumstance of ACL injury in this sport [2]. The purpose of this study was to describe and compare, across gender, knee kinematics and angular displacement of the whole body during an unconstrained manoeuvre. The null hypothesis was no difference across gender in the axial rotations of the pivot knee during the stance phase.

Patients and methods.— Fifteen females and fourteen males executed the same sidestep manoeuvre. All were trained to practice this manoeuvre in their federal handball structure. Spatio-temporal data and kinematics of the pivot knee, ipsilateral foot and hip, pelvis and trunk were calculated using a 3D motion analysis system Vicon. A Mann-Witney test was used to compare data.

Results.— The gesture was analyzed highly reproducible despite the absence of constraint. At initial contact, men had a higher instantaneous speed. The duration of the stance phase was similar. No gender significant difference was found in the axial rotation of the knee during the pivoting stance phase. At initial contact, women exhibited less knee flexion and more knee valgus. Pelvis rotation was greater in men. Gender differences were also found during the stance phase in knee frontal plane and in the hip transverse plane.

Discussion.— The observed knee postures suggest an increased ACL injury risk at initial contact in women. A prevention work could be proposed to decrease the risk. Relationships between knee and hip seem important.

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Orthopaedic surgical wounds in physical and rehabilitation medicine ward

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Keywords: Surgical wound; Surgery; Dressing; Rehabilitation

Background.— How long surgical wound should be dressed is a matter of local preference and habits. Maintaining such the dressing creates discomfort for the patient and increased care burden for nurses.

Objective.— Evaluate orthopaedic surgical wound healing (non-resorbable stitches or staples) according to local treatment and assess nursing and rehabilitation care.

Method.— To take off wound dressing as soon as possible when entering the PRM ward, if there is no risk to the patient (incontinence, behavioral disorders) and with the patient's agreement, after developing an interdisciplinary ward meeting procedure based on a literature review (1980–2010). To assess the consequences for the patient and for the care team.

Results.— Hundred and one patients, mean age 64 years, hospitalized in our PMR ward between 06/14/10 and 02/28/11, had 103 surgical procedures. All patients had a dressing at the admission 6.6 days postoperative. Seventy-nine incisions are left undressed (76%) on average 1, 5 days after admission. The stitches were removed at 15.8 days post-surgery. Twenty-four surgical wounds were kept dressed, 2 on patient's demand. The stitches are removed at 16.6 days post-surgery. All patients healed without dehiscence or local infection. Deep sepsis after fixation of the acetabulum was externalized secondarily. The results are similar after planned surgery or after trauma surgery.

Discussion—Conclusion.— A review of the literature shows that there is no interest in maintaining a dressing beyond the third postoperative day. In our study, early dressing removal did not cause local infection. In addition, wound monitoring was easier, massage began earlier, washing was easier and daily life more comfortable for the patient. Nursing care burden decreased: reduction of at least one dressing per patient per stay (reduction of material and nursing time), easy removal of stitches/or staples. Efficiency increased.

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Apport de l'isocinétisme dans la prise en charge rééducative du syndrome fémoropatellaire

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Mots clés : Isocinétique ; Syndrome fémoropatellaire ; Évaluation ; Rééducation ; Genou

Introduction.— Les dynamomètres isocinétiques sont largement utilisés dans la pathologie articulaire et musculaire. De nombreuses équipes ont utilisé cette technique pour l'évaluation de l'équilibre musculaire du genou et aussi pour établir des protocoles de prise en charge rééducative selon la pathologie sous-jacente.

Nous nous sommes intéressés au cas particulier du syndrome fémoropatellaire. Il s'agit d'un syndrome clinique fréquent, au cours duquel l'hypothèse d'un éventuel déséquilibre musculaire est de plus en plus soutenue.

Nous nous proposons d'étudier dans un premier temps l'équilibre musculaire du genou chez des sujets présentant un syndrome fémoropatellaire clinique, puis dans un deuxième temps, de comparer la force de l'équilibre musculaire du genou de patients présentant ce syndrome avant et après rééducation isocinétique.

Patients et méthodes.— Il s'agit d'une étude rétrospective incluant 36 malades suivis à la consultation externe pour syndrome fémoropatellaire. Tous les patients ont bénéficié d'une évaluation isocinétique des genoux sur un dynamomètre BIODEX aux vitesses de 60°, 120° et 180°/s. Vingt de ces 36 patients ont suivi une rééducation isocinétique des genoux adaptée à l'évaluation.

Résultats.— Un déficit de la force musculaire des ischio-jambiers a été noté chez 26 patients. Le déficit musculaire du quadriceps a été noté chez 17 patients. Un déséquilibre musculaire a été noté chez 31 patients : en faveur du quadriceps chez 20 patients et en faveur des ischio-jambiers chez 11 patients. Chez les 20 patients ayant bénéficié d'une rééducation isocinétique, un gain de force musculaire, aussi bien du quadriceps que des ischio-jambiers a été noté dans tous les cas. Une correction statistiquement significative du ratio agoniste/antagoniste a été observée chez 77,77 % des patients.

Conclusion.— Le syndrome fémoro patellaire est d'origine multifactorielle. En dehors des anomalies osseuses, les facteurs musculaires : faiblesse, rétractions et/ou déséquilibre musculaire sont primordiaux. Les protocoles isocinétiques constituent un complément utile des méthodes classiques d'évaluation et de rééducation utilisées.

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