EFFECT OF PATELLOFEMORAL PAIN SYNDROME ON ISOKINETIC PROFILE FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION.

MONNOT D., LE GUEN M., ROGOWSKI I., VIGNE G., SONNERY-COTTET B., THAUNAT M., FAYARD J.M., SEVREZ V.

1 Centre Orthopédique Sainty; FIFA Center of excellence, Lyon, France; 2 Hôpital Privé Jean Mermoz; Lyon; France; 3 Association Health and Sports Science for Human Body; Lyon; France; 4 Athletic France; Lyon; France; 5 Université de Lyon, Lyon, France; Université Lyon 1, Lyon, France; Centre de Recherche et à l’Innovation sur le sport-EA 647, Villeurbanne Cedex, France;

Introduction

- 87% of anterior cruciate ligament (ACL) operations are related to sport on 7251 patients. (Colombet et al; 2007)
- 65% of the accidents occur during contact and pivot sports. (Colombet and al; 2007)
- 15% delayed the resumption of sport activity due to patellofemoral pain syndrome (PFPS). (Savalli; 2004, Shelbourne; 1997)

Few studies examined the PFPS. To reduce the incidence of this pathology, causes need to be identified.

Aim of the study: Comparison of isokinetic profiles of grafts and athletes with and without PFPS after ACL reconstruction.

Material and Methods

- Participants: 621 individual with (group PFPS, n= 69) and without (group asymptomatic, n = 552) PFPS after ACL surgery:
  - ACL-BPTB (patellar tendon, n=98)
  - ACL-ST (semitendinosus tendon alone, n=135)
  - ACL-Hamstring (semitendinosus combined with gracilis tendon, n=298)
- Isokinetic tests (Contrex MJ, Dübendorf, Switzerland) were performed 6 months (± 20 days) postoperative to bilaterally assess the strength of quadriceps and hamstrings muscles. The peak strength were normalized by body weight.

Flexion and extension for concentric strength of quadriceps (Qcon) and hamstrings (Hcon) muscles at 90°/s
Flexion and extension for eccentric strength of quadriceps (Qecc) and hamstrings (Hecc) muscles at 30°/s

- Analysis of covariance with two independent factors (type of autograft: BPTB, ST and Hamstring, and PFPS: with and without), using performance of contralateral leg as covariate, were applied using SPSS 11.0.

Results

PFPS was significantly higher for ACL-BPTB graft than for ACL-ST and ACL-Hamstring graft (p ≤ 0.001).

The quadriceps maximal strength are significantly lower in PFPS groups (p ≤ 0.001).

The maximal strength decreased by 28,7% for concentric and by 20,7% for eccentric contractions.

Discussion

- We suppose that ACL-BPTB graft increases the PFPS risk at 6 month postoperative.
- These results may be explain by quadriceps atrophy and vastus medialis activation delay. (Giles et al; 2013, Lankhorst and al; 2012)
- Implementation of specific quadriceps strengthening protocol to treat PFPS (Lankhorst and al; 2012) may be a promising way to restore agonist-antagonist strength balance.

Conclusion

This study showed that:
- The number of patients with postoperative PFPS was higher after ACL-BPTB graft.
- Symptomatic patients presented quadriceps strength deficit in concentric and eccentric contractions.
- Strengthening protocol focusing on the quadriceps muscles, has to be implemented, to achieve daily and sports motions without pain.
- Electromyography measures during isokinetic tests could bring additional information on muscular coordination of the different points of the quadriceps muscle.

References

Giles LS, Webster KA, Mcclelland JA, Cook J. Does quadriceps atrophy exist in individuals with patellofemoral pain? A systematic literature review with meta-analysis. The journal of orthopaedic and sports physical therapy 2013; volume 43, number 11.
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