

Multidisciplinary Discussion Around the Management of Anterior Cruciate Ligament (ACL) Ruptures

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Abstract

Anterior cruciate ligament (ACL) rupture is a functionally significant injury that requires individualized treatment, either surgical or conservative, guided by a multidisciplinary team. Although surgical reconstruction is often the default approach, recent evidence supports conservative management in selected patients without serious associated injuries. This review analyzed four randomized controlled trials, SNNAP, KANON, COMPARE, and Tsoukas et al., to compare outcomes of surgical and non-surgical treatment. The SNNAP trial reported higher KOOS scores in the surgical group (mean difference 7.9; $p=0.0053$), though not clinically significant. The surgical group also reported better subjective improvement and cost-effectiveness. The KANON trial found no significant difference in functional scores or complication rates at 2 and 5 years, but greater laxity and a 51% surgical crossover in the conservative group. COMPARE showed slightly better functional and quality-of-life scores in the surgical group, while Tsoukas et al. reported better IKDC scores and reduced laxity in the surgical group after 10 years. Overall, about 50% of patients initially managed conservatively required later surgery due to instability. Conservative treatment can be effective with structured rehabilitation, close monitoring, and proper patient selection. Identifying "Coper" patients, those without instability after rehabilitation, is critical to avoiding delayed surgery and secondary joint damage. Optimal management involves early rehabilitation, regular assessment, and clear communication among sports physicians, surgeons, and physiotherapists. Educating patients about both treatment options and reassessing them at three months ensures informed decisions and better long-term outcomes.

Keywords: ACL rupture, conservative treatment, coper classification, knee instability, rehabilitation, surgical reconstruction,

Introduction

An anterior cruciate ligament (ACL) rupture is an injury that can have significant functional consequences regardless of the therapeutic decision: whether to operate or not (1). Recently, numerous articles have highlighted the effectiveness of rehabilitation treatment alone in selected patients. Conservative treatment can be considered in the event of an ACL rupture without serious associated injury

(for example, a meniscal bucket handle tear, extensive cartilage damage, or grade III collateral ligament injury) (2). As a healthcare professional, it will be appropriate to clearly explain the risks and benefits of the two therapeutic options to individualise and improve patient management. Currently, approximately 50% of patients refuse initial conservative treatment, preferring surgical treatment (3).

The decision and therapeutic follow-up after ACL rupture are multidisciplinary (physiotherapist, sports doctor, surgeon). Like surgical treatment, conservative treatment must be followed and its effectiveness evaluated because it is not a default treatment but a real, reasoned therapeutic decision, and the recent literature is of excellent quality on this subject.

Methods

Regarding the differences in results between initial conservative and surgical treatment, our analysis of the literature found four randomised controlled trials (RCTs): the SNNAP trials (3), KANON (4, 5), COMPARE (6), and the Tsoukas et al. study.

Results

The SNNAP trial reported KOOS score results (add reference) at 18 months of 73.0 ± 18.3 in the surgical group and 64.6 ± 21.6 in the rehabilitation group. The adjusted mean difference was 7.9 (95% CI 2.5-13.2; $p=0.0053$), indicating a preference for surgical management, although this difference was not clinically significant (15.7) (7). Subjectively, 83% of operated patients described their knee as improved by management compared to 68% of patients rehabilitated only, with a significant difference. The TEGNER score (ref) at the last follow-up was also better in the surgically treated group (5 vs 4, $p=0.0065$). Surgery was described as the solution with the best cost/effectiveness ratio in the English healthcare system. The results of this study show that conservative treatment should not be continued if the patient has functional instability.

The KANON trial reported the same KOOS, TEGNER Activity Scale, and SF36 scores at 2 years, with no difference in complication rates but with a higher rate of anterior and rotational laxity in the rehabilitation group (4). At 5 years, no difference appeared between the groups with the addition of radiographic osteoarthritis research ($p=0.17$). The secondary surgical conversion rate was 51% in the rehabilitation group (5).

In the COMPARE trial, at 2 years of follow-up, the IKDC score results appeared better in the

surgical group ($p=0.026$) but not clinically significant (difference between the groups 5.3, 95% confidence interval from 0.6 to 9.9) (6). The surgical group also had a better KOOS score (80.2 vs 72.8, $p=0.039$), not clinically significant, as well as a better quality of life score (76.6 vs 65.8, $p=0.002$). The surgical group presented a better Lysholm score (90.6 vs. 87.1, $p=0.041$). It should also be noted that patients treated in the rehabilitation group presented more residual instabilities at the last follow-up. 50% of patients initially assigned to the rehabilitation group chose to have surgery secondarily.

Finally, in the longer term, Tsoukas et al. found a better IKDC score in the surgical group (86.7 vs 77.5, $p=0.04$) and reduced laxity at 10 years of follow-up. They found no clinically significant difference in osteoarthritis and function between the two types of management.

Discussion

Overall, it appears that conservative treatment allows 50% of cases to avoid surgery, with the other 50% choosing a secondary ACL reconstruction due to persistent apprehension/instability (3–6). The average time to secondary surgical management was 10 months (6), 11 months (4), and 28 months (5), respectively.

While the KANON study reported a comparable rate of meniscal lesions between the two types of management, some cohort studies report a higher risk of secondary intra-articular lesions in cases of late surgery (8, 9). It is therefore essential to educate patients to detect episodes of functional instability when conservative treatment is initiated. A knee that gives way, swells, and is painful is a sign of new trauma that may cause secondary damage.

Thus, conservative treatment is a valid option as a first intention (10-12). Articular laxity may decrease, and functional results may be satisfactory. Clear and detailed information to the patient about the need for regular monitoring is essential. The objective is to detect meniscal pain or the occurrence of instability episodes that would lead to functional degradation and a poorer prognosis for joint health (13). After 3

months of structured rehabilitation, it seems relevant to re-evaluate the patient to discuss the continuation of conservative treatment (Coper: absence of functional instability, meniscal pain, improved laxity tests, and satisfactory results on functional tests) or referral to surgery. For example, Thoma (14) proposed a classification of the patient as COPER if he validated all of the following characteristics:

- Timed 6-meter hop > 80% LSI
- Knee outcome survey – Activities of Daily Living score > 80%
- SKV > 60%
- Less than one episode of instability

Regarding the principle of cost-effectiveness of one treatment compared to another, there are conflicting arguments with questionable transpositions to the French healthcare system (3, 15, 16).

Conclusion

Key elements to optimise management after ACL rupture:

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1. A concerted multidisciplinary approach (sports doctor, surgeon, physiotherapist), with rehabilitation initiated quickly after the injury.
2. Complete information on the benefits and risks of the two therapeutic options, allowing the patient to make an informed decision.
3. Structured monitoring of progress in case of conservative treatment (assessment of joint laxity, episodes of functional instability, and meniscal pain). With a new assessment at 3 months of management to detect non-COPER patients requiring surgical management.
4. Effective communication between healthcare professionals (sports doctor, surgeon, and physiotherapist).

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