MAY 15, 2023

OPEN ACCESS

Protocol Citation: Giuseppe Filardo, Andreas Serner, Luca Andriolo, Andrew Massey, Emmanuel Papakostas, Peter Verdonk, Elizaveta Kon 2023. Surgical decision-making in the management of knee cartilage injuries in football players: Development of patient-specific recommendations using the RAND/UCLA appropriateness method. **protocols.io** https://protocols.io/view/surgical-decision-making-in-the-management-of-knee-ctshwnb6

Protocol status: In development
We are still developing and optimizing this protocol

Created: May 05, 2023

Last Modified: May 15, 2023

PROTOCOL integer ID: 81449

Surgical decision-making in the management of knee cartilage injuries in football players: Development of patient-specific recommendations using the RAND/UCLA appropriateness method

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Keywords: cartilage, football, consensus, recommendation, protocol

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ABSTRACT

FIFA and ICRS aim to develop, through a structured consensus method, indications on how to properly address cartilage lesions in football players.
Accordingly, a consensus is planned based on the RAND/UCLA Appropriateness Method (RAM), which is used to develop patient-specific recommendations by combining the best available scientific evidence with the collective judgement of a panel of experts guided by a core panel and multidisciplinary discussers.

GUIDELINES

Introduction and Rationale

Football (also known as soccer) represents one of the most practiced sports in the world. The complexity of the movements requested in football puts players at a high risk of articular damage of the lower limb, which has been reported in up to 60% of knee arthroscopic evaluations of high-impact sport athletes [1, 2]. Overall, 32 to 49% of former professional soccer players end up in osteoarthritis, predominantly at the knee and hip, especially in case of concomitant ACL and cartilage lesions [3, 4]. This may lead to significant games loss and even to sport retirement in almost a quarter of the players retiring due to injury [5].
Consequently, it is key to properly address knee cartilage defects, aiming to return to play, possibly avoiding knee early degenerative changes. Symptomatic cartilage lesions are often addressed conservatively [6], but in case of failure of less invasive strategies, surgical solutions must be considered. Multiple procedures are available for the management of cartilage defects (e.g. drilling, microfractures, osteochondral autograft or allograft transplantation, autologous chondrocytes-based procedures, and cell-free chondral and osteochondral biomaterials), with good results reported in the general population [7-9], but little is known about the outcomes in high level athletes, specifically football players.

Moreover, important factors on decision-making, which could be paramount in football players, are currently not considered in the treatment algorithm, which often fail to account for patient profile and specific needs. This leads to the need of a patient-centered decision making, including the most common clinical issues that team physicians face when managing football players with cartilage lesions.

To this aim, ICRS and FIFA decided to develop, through a structured consensus method, indications on how to properly address cartilage lesions. Accordingly, a consensus is planned based on the RAND/UCLA Appropriateness Method (RAM), which is used to develop patient-specific recommendations by combining the best available scientific evidence with the collective judgement of a panel of experts guided by a core panel and multidisciplinary discussers.

Methodology

RAND/UCLA Appropriateness Method (RAM) Approach

The recommendations will be reached through a consensus process aimed at exploiting the best available scientific evidence together with the collective judgement of experts to help physicians in the daily practice. In fact, randomized controlled trials are often neither available nor able to provide enough detailed evidence to apply to the wide range of patients seen in the clinical setting. In this light, the RAM consensus method [10] was selected to provide recommendations. RAM has the advantages of incorporating current scientific evidence together with expert opinion, allowing both confidential ratings and group discussion, with a moderate to excellent reproducibility as determined by different panelists for “appropriate” and “inappropriate” care, and having acceptable predictive validity for a recommendation supported by randomized controlled trials [11].

Three interdependent groups have been planned for the RAM process: a core steering group, an surgical expert panel, and a non-voting multidisciplinary discussion panel. The core steering group defines the scenarios of the RAM and, through an expert moderator, guides the panels through the RAM tasks. The expert panel, composed by an uneven number of orthopedic surgeons, uses the data provided by the core panel to come to a consensus. The panel members are selected based on their scientific and clinical expertise in cartilage treatment for football players. Selection is based on FIFA Medical Center of Excellence and/or ICRS involvement (orthopedic surgeons affiliated to a center), publications on common knee injuries for footballers (ACL, meniscus, cartilage) and surgical volume. Care is also taken to include female surgeons and to expand the geographical distribution to all continents. The multidisciplinary discussers panel will include sports physicians (football team doctors) and physiotherapists, also considering the input of players with experience with knee cartilages injuries, selected through personal connections and interviewed to include their perspective.

The RAM process is preceded by a literature overview to develop the clinical

scenarios and ensure that panelists had access to the body of evidence prior to the rating procedure.

Systematic Literature Review

An extensive review and collection of the current literature is performed. The search is conducted with no time limitation, and without any filter, using the following string: (football OR soccer OR sport) AND (knee) AND (cartilage OR chondral OR osteochondral OR subchondral) AND (treatment OR surgery OR procedure OR technique). The PRISMA (preferred reporting Items for systematic Reviews and Meta-Analysis) guidelines are used. The first screening is performed separately by two independent observers during which articles are sorted by title and abstract. The inclusion criteria for selection are: (1) football/soccer player cartilage injury and their management, (2) randomized controlled trials (RCT), cohort studies, case-control studies, case series and case reports. Exclusion criteria are articles not containing data specific related to football player knee cartilage injury management, and not focused on the knee joint.

For the second screening the full texts are retrieved and screened to identify relevant studies and exclude those that did not fit the criteria. Once a definite list of studies to include is established, the relevant data are extracted to be later analyzed for the purpose of this study. The information retrieved include: year of publication, type of study, number of football players included, age, sex, BMI, level of play, mean follow-up, lesion size, lesion location, lesion etiology, lesion classification, surgical procedure performed, number and type of combined procedures, number and type of previous procedures, rehabilitation protocol, failure definition and rate, re-intervention rate, complications, results, return to sports (to any level and to the same level), and time to return to sport. For the assessment of the methodological quality of the collected data, the Coleman Methodology Score (CMS) by Kon et al. [12] is applied. A risk of bias assessment is performed according to Downs and Black [13]. The literature review as well as an overview document will be available to all members of both panels.

RAM process

Clinical scenario development

Based on literature results with possible additions according to the experiences of the core group and considering the input of both discussers and the players perspective, a list of specific characteristics for the surgical decision-making process is created. These characteristics are chosen according to the available literature evidence and experiences suggesting a correlation with the clinical outcome after treatment and could therefore influence the appropriateness of the procedure.

These characteristics are used to develop different clinical scenarios. Each clinical scenario describes a patient with a set of characteristic features presented in the form of a matrix categorizing football players with knee cartilage injuries. The scenarios are grouped into “chapters” based on the choice of the core steering group to present the different scenarios to the voting panel.

The final clinical scenarios list is obtained by the core group based on the

literature and their experience, and the consideration of both multidisciplinary discussion panel and players perspectives.

Appropriateness rating process
The expert panelists are asked to individually assess the appropriateness separately for each cartilage treatment for each scenario, blinded to each other's responses.

The appropriateness of the treatment indications in the different scenarios is rated in 2 rounds. As per RAM method, the 2-round process is designed to sort out whether discrepant ratings are due to real clinical disagreement over the use of the procedure ("real" disagreement) or misunderstandings ("artefactual" disagreement) or to scoring fatigue. In the first round, the expert panel receives the clinical scenarios by email and is asked to rate the intervention appropriateness. According to the RAM, each panelist ranks, independently from the other panelists, the appropriateness for each scenario on a 9-point Likert-scale, in which a score in the range 1 to 3 is considered "inappropriate," 4 to 6 "uncertain," and 7 to 9 "appropriate." They are requested to use the synthesized evidence provided by the core steering group. The expert panelists are asked not to consider the cost of the procedures in rating the appropriateness of the scenarios. Panelists' comments emerging from this round are encouraged and collected as well.
The total rating of all clinical scenarios is expected to take 60 to 120 min to complete for each rating round, and the panelists are given 4 weeks to respond. In the second round, the expert panel and the discusser panel meet in person for 1 day under the leadership of an experienced moderator. The players perspective collected through the interviews will be considered through this phase, and players will be invited to contribute to the discussion. Each panelist receives an individualized document showing the distribution of all the overall first round rating of the experts, together with their own specific ratings. During the meeting, panelists discuss the ratings, focusing on areas of disagreement, and are given the opportunity to modify the original list of indications and/or definitions, if desired. The panel is not forced to consensus, and after discussing each chapter of the list of scenarios, experts rerate each indication individually.
The use of the treatments for each scenario is classified:
• "Appropriate": median score of ≥7 without disagreement
• "Inappropriate": median vote of ≤3 without disagreement

A scenario receiving a median score between 4 and 6, or a scenario with disagreement, is classified as "uncertain." The presence of voting dispersion is calculated by statistical analysis based on the Interpercentile Range Adjusted for Symmetry (IPRAS), according to BIOMED Concerted Action on Appropriateness, to define the presence of "disagreement" among votes in each scenario. In detail, IPRAS is calculated as follow: IPRr + (AI * CFA), where IPRr is the Interpercentile Range required for disagreement when perfect symmetry exists; AI is the Asymmetry Index; and CFA is the Correction Factor for Asymmetry. An indication

is rated with disagreement if IPR > IPRAS for that specific indication [10]. Discussion points for each scenario will be captured to present potential reasons for this uncertainty/disagreement. An “uncertain” recommendation can reflect either the ambiguous state of current evidence or equivocal appropriateness either due to a moderately unfavorable risk profile or to limited efficacy. However, the “uncertain” classification is not intended to be a negative recommendation or to preclude a priori the use of the treatment for the specific scenario, relying on the physician-patient interaction in determining treatment decision in the context of the individual characteristics, comorbidities, and preferences.

Panel selection

The expert panel for this consensus foresees only surgeons. This has been considered also in light of the potential drawbacks. Previous studies have shown that, in general, those who perform a procedure tend to rate higher on the appropriateness scale than those who do not, with the result that more indications are rated appropriate by the panel than when multiple specialties are represented [14]. On the other hand, as in previous RAM consensuses [10], other specialties would not have the necessary exposure and experience with the specific techniques evaluated within the scenarios, and thus could not be considered experts and eligible for the expert voting panel. However, to balance and include multiple perspective in the discussion leading to the voting rounds, a non-voting discusser panel has been planned, including multiple specialties as well as players/patients [15]. The main selection criteria to be considered are acknowledged leadership in the panel member’s specialty, conflicts of interest, geographic diversity, and diversity of practice setting. Moreover, the selection will consider the importance to work toward gender balance consistent with that of the profession.

In relation to panel selection, the surgical expert panel is created based on objective closeness, whereas the multidisciplinary discussion panel and the players are based on mandated and subjective closeness [16].