Essentials of Sports Injury Prevention & Rehabilitation

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Lecture - 37
Return to sports & long term injury prevention - Part 01

My client is a Kabaddi player. He suffered an ankle injury during his practice. He is a key player of his team and his role is important for the team to be in the tournament. I have instituted a rehabilitation program for 4 weeks and the competition will start in 6 weeks. How do I make a decision about the return to sport process of my client? I don't want him to get re-injured as well.

So, if you are one of those people who is looking for answers to such questions then you are at the right place. Welcome to this course on return to sports and long term injury prevention offered by NPTEL. This is the final week, week 8 of the course on essentials of sports injury prevention and rehabilitation. So I am Wing Commander, Dr. Chandrasekara Guru. I am a sports medicine specialist, and assistant professor in this field with armed forces medical services. During this module you will be learning about return to sports concerns, the decision making approach for return to sports, what is the framework that one needs to apply, what are the various aspects with respect to re-injury prevention after returning to sport and after returning sport what is beyond re-injury. So we know that sports injuries is an amalgamation of proper rehabilitation and effective rehabilitation in phases with a comprehensive injury prevention program and leading on to a successful early return to sport. The rehabilitation program happens in different phases based on the stages of inflammation and healing.

So the phase 1 of rehabilitation is acute management of the injury. Phase 2 is focused towards issue healing, here in terms of addressing the cause especially the biomechanical factors, general fitness of the individual during this phase you tend to have detraining effects so you want to also maintain the general fitness and conditioning of the individual. In phase 3 with a better healing of the tissues happening we move on to replicating certain sports specific demands thus causing some amount of stress on this injured tissue. Phase 4 would involve returning to sport and final phase 5 involves preventing re-injury. So in this particular module we will be focusing on return to sport and long term injury prevention and the challenges when to return to sport and how to prevent re-injury.

Let us look at these challenges. So if the question is when will I return to sport or when will I return to play, it involves a decision making process right. The decision making process is very complex because it involves the athlete, it involves the parents, it involves the coach as well as

the administration. It is a difficult decision to make considering the sports as well as the other career related factors that is not directly related with the injury but are very important and pertinent and it becomes more multi factorial considering various personal factors, social factors, psychological factors, academic, financial and career related factors or whatever be the complexity of the decision making process. Similarly the decision making should favor and should be more athlete centric.

It can also happen this way that you can, you know, kind of make an early return to sport without properly adhering to these various principles. So that can happen because miscommunication can also lead to loss of trust between the clinician or the team which is involved, probably the coach and the trainers and between the athlete and the parents and the friends. There may be potential litigation issues because of improper return to sport. The athlete also will face reduction in the chances of sports participation if the return to sport is improper and as a major and important issue, it can also pose a major threat for the athlete to have various medical complications because of premature return to sport. Hence, the decision making process should be multidisciplinary approach by a team involving the sports medicine physician if available or the medical doctor or the team physician who is associated with the team who knows the athlete and the way the individual follows the training program well, a sports physiotherapist, a coach, the strength and conditioning or the athletic trainer who prepares the individual to perform sports specific demands and then obviously important aspect of the loop that is the administration.

So the decision making should be a collective decision making by this multidisciplinary team. So since it is a multidisciplinary team, it is important that there is right communication both within the team as well as between the team as well as the athlete. So that this also reduces the chances of lack of rest and miscommunication. Further, the return to sport decision should be based more on a structured objective criteria and these should be in kind of with a detailed planning and effective rehabilitation program. It should have different phases with focused smart goals as we discussed, it should be sizable, measurable, achievable, reproducible and timed goals which the athlete can achieve during the return to sport process.

The risk assessment has to be taken into consideration with respect to the personal, social and sports related factors and the objective functional test which are used as progression criteria from one phase to other phase have to be clearly defined and have to be used for progression to the next phase. And overall as we said earlier and retreating again, the collective decision should be focused towards the benefit and well-being of the athlete, both physical as well as mental. So this kind of a formal and structured process outlining the return to sport decision is very important to have to negate or to counter the problems that happen because of improper return to sport. So this is a decision making process per se in various stages. The stage one is more of tissue health assessment, stage two is tissue activity assessment and stage three is risk tolerance

assessment.
So seeing about stage one , the tissue health assessment, it includes the demographics related factors like age and gender because different injuries are common in different age groups, and they have different progression and the stages of healing varies based on the age. Gender is again important, certain types of injuries are more common in females and the approach to such individuals in returning back to sport should have a specific target towards that into consideration. It should also assess the tissue health level in terms of symptoms like pain, disability, and the symptoms of giving way in case of dislocations and other joint issues. Certain medical conditions have to be considered when you are, these parameters are important because certain conditions like recurrent injury gives an important input to you in terms of structuring and preparing and planning an effective rehab program so that this aspect is addressed. The associated comorbidities, medical comorbidities have to be taken into consideration and the physical examination factors more so in terms of swelling, the muscle power and strength have to be documented.

And lastly the special test which is used in terms of identifying the structure involved have to again be very specific and the confirmatory, then imaging modalities to confirm these provisional and the clinical diagnosis have to be also taken into consideration when we assess the overall health of the injured tissue. Once this stage is done, this has to be clearly assessed by the treating clinician and the individual has to be very sure that none of the aspects are lacking and this stage is done then we progress to something called stage 2 that is tissue stress assessment. As we discussed earlier, tissue stresses are giving certain sports specific stress to the tissue, you are considering those factors that can increase the stress on this injured tissue and you are assessing the response of the tissue to these stresses. So it depends on the type of sport, the type of assessment that we do for a contact sport vis-a-vis a non-contact or a static sport is going to be different. It is different for a team sport and vis-a-vis a static solo sport.

It depends on the position played, say rehabilitation process for an ACL injury would vary from a striker to a midfielder to a defender based on the different types of motor strength and power that is required for that particular position. And invariably during injury and during rehab it is important to also assess the differences that are there with respect to leg dominance. So the injury versus the non-injured area has to be considered as well as the side to side alignment has to be corrected if any are there. The competitive level is also important. So the competitive level determines in terms of the importance of the event per se.

It can be a knockout to a league match event where the return to sport can be accordingly, the decision can be taken accordingly giving the benefit of doubt to the player. Also depends on the stage of the competitive level as district level or a state level or national level or Olympic level or international level. So this also is an important factor in terms of arriving at a return to sport decision. The ability to protect. So in certain regions you have certain additional equipment,

protective equipment to give additional safety to the region.

So depending on that the decision also can be taken. Another factor is the functional test. So obviously in order to stress or assess the stress that is given by the particular sport, you need to perform a certain functional test on the injured tissue. So based on the outcome of the functional test you would be able to come to the conclusion where the individual is able to withstand the stress of the sports that is given on to the injured tissue.

And the last part is the psychological readiness for returning to sport. This we have studied in detail or discussed in detail in the previous module on psychological aspects of injury rehabilitation and prevention. So with the prelude of stage 1 and stage 2 the progression happens to stage 3. Now in this stage 3 of the return to sport decision making process, we assess the risk tolerance. Risk tolerance in terms of what is the risk in terms of taking from a knockout stage to a league stage to a half season period of the injury rehabilitation process. Pressure from the athlete per se, the desire to compete or the individual is non-adherent.

External pressure from the coach or from the parents or from the family or the sponsors. How well the individual is able to mask the injury, whether the masking is by using adhesive straps and tapes and the effective analgesics. And obviously the decision is also determined by certain other factors that are not related to injury directly like conflict of interest, wherein we will find the entire team which makes the return to sport decision is also employed by the same federation or the sporting organization. So there remains a conflict of interest between the decision that being taken for return to sport being part of the same organization. Obviously the fear of litigation is there if the individual is restricted from participating also may be there because of the various agreements that happen in the commercialized sport settings and various litigation can happen from the medical legal aspect if allowed to participate with the premature you know rehab program.

These are the various aspects of, or the stages that one can go through the return to sport criteria or decision making process. So let us understand with a case scenario. Let us take an example of the same case which we discussed in the psychological aspect. Ankita is a gymnast from Delhi. She used to get anxious before the competition as an athlete. Recently she had experienced a bitter breakup in a romantic relationship. She competed in a national qualifier at Chennai against fierce components where she had never been before at Chennai. This time her father was also not there to give her support. She deeply thought and got worried about the magnitude and the importance of the match and was really stressed out. She had problems in sleep the previous night during the competition. Her heart rate rose up so high and her palms were sweating and she was feeling tightness of her muscle throughout the body. During the performance of the vault she became very nervous and landed on the outer aspect thereby injuring her left ankle and was diagnosed with a grade 2 ankle sprain.
After acute management she had undergone four weeks of rehab now. Her father, a coach, was a

big support to her during the rehab process and she was very dedicated and regular in her rehab sessions. The adherence was good. She now asks you when she will return to play. How? As part of the decision making group you will plan her return to sport apart from an effective rehab program that you have designed.

Discuss the other factors that need to be considered. Let us analyze this case. So Ankita is a 17 year old gymnast. She used to get anxious before the competitions and she recently had a life stress event. She is a young athlete with competitive trait anxiety features and she has had a major life event in the recent past, and cognitive response is all to affect her because of the new place because of the lack of social support from her father during the competition. And she responded to that situation in terms of worrying more about the competition per se , how to qualify this particular competition or win this particular competition.

In return a physiological response or the stress response was that she had disturbed sleep, because of which reaction time was not good, the balance was not good and motor performance also what affected, and she also in fact had features of somatic anxiety in terms of increased heart rate, muscle tension and sweat in the peripheries. So because of the overlapping potential stressful sports situation with a national qualifier for her to qualify with the competition she ended up in an injury, with grade 2 ankle sprain. The rehab program was over 4 weeks, but then however with the good support of your team she was able to perform well during the rehab adherence was very good. The support shown from her coach as well as her parents was really good. So now the main question comes: when will I return to play? So this is the most common question that an injured athlete will ask you. So in this particular case of ankle sprain, ankle sprain is prone for recurrence. It is known from literature that whenever an individual with a past injury sustains an injury the chance of reinjury increases up to 10 times in the initial period of 6 to 12 months.

So that needs to be addressed, and the rehabilitation has been, you know, given an effective rehabilitation program for 4 weeks. So with this kind of prelude what we do with the return to sport decision making process is stage 1. So first we assess the tissue health. The tissue health has to be assessed based on the individual and the examination findings and it was found to be within normal limits. The stage 2 is assessing the tissue stress related to the sports being played.

So the functional tests were done and the functional test for this case of ankle sprain would be single leg balancing with eyes closed, ranging up to a star excursion test and various others increasing the difficulty level. So you can choose as per your fixed protocol that you follow in your rehab center. An important aspect is here the injury is prone for recurrence, so it is important to address the cause as well. The biomechanical factor has to be addressed. So the individual as injured during landing, so if you could get hold of the footage because it is a national level there might be some footage, or if any of your friends have taken a video footage,

then you can assess the landing technique or you can ask the individual to again do the landing technique, and from a biomechanist assess the landing technique that is has to be ideal for the particular sport.

Also assess the asymmetries that are there between the limbs, and if they are there they have to be addressed. Now we know that in cases of ankle sprains to prevent reinjury you also need to advise ankle strap or ankle binder for stimulating the proprioception whenever the individual is practicing or playing, so that it is continuously there during the initial at least one year period. Also an important factor is to assess the psychological readiness of the individual. In this case she herself is coming forward and asking when she will return to play, so that means that she herself is ready to go back to sport, that is what she feels. So in this case what are the risk tolerance factors that you will assess this is the stage 3 of RTS process.

So, she is a national level gymnast injured during a qualifier, so it is important that she has to take part immediately and there is definite pressure to compete and qualify in the next upcoming competition and even though in this case there is no financial or any fear of litigation that has been brought out. So the decision here would be kind of addressing the first two steps step 1 and 2 in terms of risk assessment and they are satisfaction here. The functional and sport specific battery of tests using an objective criteria have to be done, and they should be satisfactory for the normative findings that you have with respect to the injury per se. Then the psychological support, the stress relaxation techniques and counseling along with the father and coach has to be done, so that the social support that she really thrives on has to be there for her to perform better. Biomechanical correction: by addressing the landing techniques, you discuss with the coach and also with the athlete to change these biomechanical factors that are improper or if it is found abnormal.

There should also be a team meeting with the other components of the rehabilitation process, namely the physio, the therapist, the conditioner, the biomechanist as well as the psychologist if they are available, and they should be included in the return to sport decision making in this particular case. However, we find that individuals with similar functional outcomes end up finally having different kinds of RTS or return to sport. How can this happen? We know that step one we assess tissue health, step two is assessment of tissue stress where we are very focused and objective based. So the risk assessment factor may assessment of the factors of two different individuals may have the same scoring until this step. But however, when you consider the risk tolerance that is step three where the other unrelated factors to injury come into play.

So that changes the situation of how an individual decides whether this athlete should return to sport or not. So these factors which commonly found to influence the decision making in the process are stage of the season the individual is playing, pressure mainly the pressure from the athlete as well as from the sponsor, conflict of interest if the team is employed by the same you

know firm and this fear of litigation that is involved because of the prevailing agreements. So these factors are found to modify the return to sport decision. So that is how the return to sport decision gets complicated because of all these various variables. However, this can be kind of more strategically structured using a more recent kind of framework that has been advocated for return to sport decision making process that is the strategic assessment of risk and risk tolerance that is the start framework for RTP decisions.

So when things are not going right, you need to stop, take a step backwards and try to analyze the situation. Have a look at the rehab program, how effective it is, how the goals are being sustained, how the rehab adherence is, discuss that with the athlete per se, identify what is wrong in terms of the perception of the athlete per se, check with the nutritionist, also check with the various behavioral patterns of the athlete in terms of the you know nutritional diet intake or how is the sleep pattern that needs to be checked. And psychological factors, in the process of RTS it is very crucial that psychological factors have to be assessed and discussed with the team, take a second opinion. So that may give you a different perspective which you would have missed. So by doing this we can try to address things which are not going actually right during a RTS decision making process.

To summarize, we discussed various phases of sports rehabilitation, the concerns and the problems associated with improper RTP. We discussed the team based approach and the criteria based approach that is important for the decision making process. We start from the framework in terms of phase 1, 2 and 3 for tissue health assessment, tissue stress assessment and finally risk tolerance assessment and how the variation in the return to sport decision making can be affected because of that stage 3 factors. So for those of you who want to go in depth can refer to these further resources. Thank you.