Essentials of Sports Injury Prevention & Rehabilitation

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Lecture - 29
Management of common sports injuries

Good morning friends, myself Dr. Atul, your faculty for injury prevention and rehabilitation. Today, we are going to discuss part of injury prevention and rehabilitation, sports injuries. In the previous lectures we have discussed about sprain and strain. Now, we are again going to discuss about the different overuse injuries or acute injuries, and how you are going to manage fractures. So, fracture is an acute injury because it occurs with a single episode of any kind of blunt trauma or break, twist or sudden trauma.

As per the definition, there is a discontinuity between the bone, known as the fracture. Generally there are two types: closed and open. When the skin remains intact and the fracture ends of the bone does not come out, it is known as closed fracture. And, when the bony part or skin is abraded or skin is also affected and the bony part comes out, then it is known as open fracture. So there are other methods also of describing the fractures, but here I just discuss the common types of fracture; that is open and closed, and how you are going to diagnose whether fracture is there or not.

Many of the time and generally the athlete they are self very intelligent, and they are aware of their body, and themselves they will tell you, "I have heard of some click" or he will say "I feel like that something is tear off", first thing. Second, when you place your finger and move your finger on the fracture side you feel there is a disruption or visual deformity might be seen quite often. And, there might be crepitations over the fracture site, and there will be a mobility of bone, but for that you require some sort of experience and clinical experience. And, with the history, you can easily make out, and then the movement of that particular part is very painful . It might be deformed also. In the smaller joints or smaller bones, it is very difficult to identify or difficult to diagnose, like small phalanges or metatarsals.

And, how are you going to diagnose? For confirmatory diagnosis, you can ask for plain digital x-ray or the CT scan. 99% x-rays generally reveal the fracture. Few of the fractures might be missing, like scaphoid fracture, they generally appear after a week or so. So for them, CT scan is required. Then comes the initial treatment. It is same: PRICE protocol, Protection, that is to

protect from further injury, give him a rest, that means give that injured joint area under the rest, apply ice, give a compressive bandage and elevate that area so further blood effusion or blood loss will be stopped. Then the definitive treatment: if it is a closed fracture and there is no further, with the help of the clinician you ruled out, okay there is no muscle or nerve damage, then and in the x-ray it shows there is no displacement. You can put under the cast, and that is you can put under the plaster of Paris for 4 weeks, and then the rehabilitation starts. And, when there is a displacement, and the fracture is a multiple fracture then you might require open reduction and internal fixation. This requires a proper anesthesia and an orthopedic surgeon who can do all these open reduction and internal fixation. Rehabilitation of the fractures: once the bones are healed properly, then the nearby joints will be start mobilization, and with the help of initially electrotherapy modalities the joints get mobilized and initially we have to achieve the full range of motion, and once we achieve that full range of motion without pain, then we start doing the isometric, then the isotonic, then the strength training exercises, and then the balancing and the plyometric exercises and explosive exercises. So, this is the rehabilitation of fracture, and now comes the overuse injury. That is: medial tibial stress syndrome, which though I have covered under the previous lecture also, this is more common in the runners, those who do distance running, and all of a sudden they increased their training load or without some guidance or proper conditioning of their body, they have started running or they have some sort of malalignment of their lower limb, so the tibial portion or the medial side of the tibia got excessively loaded and this injury occurred. Again, as I told you, it depends on the age, sex and the training load, nutritional and past history. Those who have a past history of some sort of stress reaction are more prone to another one.

So once you have already suffered from the stress injury you have more chances, so you have to be very careful when you increase your load, so intelligently increase your load and always keep in mind 10% increment every week that much load you should increase. And while we are doing examinations for the medial tibial stress syndrome, that side between the lower two third and the upper one third it is an acutely localized tender and sometimes your athlete does not allow you to put your fingers or allow you to touch. Sometimes he is not able to bear weight also, if it is converted to the stress fracture, but there will be a small swelling over the lower two third, the junction between the lower two third and the upper one third, and whenever he start doing some activity or running, walking, he felt pain over that area, and initially with the activity, it weans off, but as if he is not corrected or reduced his training load, the pain will reappear.For the definitive, we can ask for the MRI because X-ray can't judge or give the diagnosis of MTSS or stress reactions. MRI is the definitive diagnostic investigation which gives you the stress reaction. In the MRI you will see there is some edema is there, cortical edema is there and in the T2 scan and T1 scan according to grade, stress reaction to the frank stress fracture also. The initial management for this MTSS is again the same, RICE and POLICE. Here comes the POLICE, you have to protect, and give up optimum loading can be allowed once he is doing his daily activity pain free, then you can ask him to do little bit of walking or cross training, like

cycling or swimming or deep water running or anti-gravity treadmill running. And, in this condition, one should be very careful about the use of NSAID, that is paracetamol, Brufen, the other easily available painkillers. These painkillers hamper the healing process als,o so one should not take painkillers or non-steroidal anti-inflammatory drugs too long, but if in the beginning pain is there and he is not able to cope up or with taking non-steroidal anti-inflammatory drugs like paracetamol 650 mg twice daily will be helpful, and it helps to reduce the inflammation also and at the stress reaction site and relief from the pain. But, if a person is taking these paracetamol or any other non-steroidal anti-inflammatory drug for a longer duration, then it hampers the healing process also. So one should be very careful. And, he has to maintain his diet, his hydration. He has to take vitamin D supplementation and calcium supplement also. So how can the healing process of these stress reactions be fast? To expedite the healing process, we can use various electro therapeutic modalities, like low intensity ultrasound therapy, it helps in the healing of the stress reaction by remodeling of the bone, and we should start early range of pain free range of motion so these adhesions in the joints doesn't form, and for we can start cross training then the deep water running anti-gravity treadmills and the same protocol, for the isotonic isometric and the stability exercises like your pelvic hurdle stability exercises all the four movements which generally occur your glute area that is flexion extension abduction and adduction. You have to stabilize this and then the your knees, calf muscles and your thigh muscles strengthening exercises. And simultaneously, you have to do stability exercise for the your ankle so after doing all these we can successfully rehabilitate your athlete or yourself from these overuse injury and we can overcome from these stress injuries or the overuse injuries. Thank you so much friends.

Now, I just briefly summarize the other entire sports injuries. So, sports injuries are not different, but sports injuries which generally refers as the overuse injuries which are common in the person who is involved in the sports or the regular exercise, they are same acute and overuse there are the examples of the overuse injuries and the acute injuries and how we can prevent these injuries, by follow the rules of games, by the playing intelligently, by doing proper warm-up, by wearing protective gear like wearing kneecap and ankle brace, or knee brace, wearing your elbow brace, correct size of your gloves while playing your golf, and choosing correct grip for the racket sports, and timely change your shoes and your gears. So, don't play with the wear and tear or low quality of gears, include plyometric and proprioceptive exercise. So your body or your mind should be aware, where is the position of your various joints; and maintain the proper hydration and nutrition. If you are dehydrated, chances of injuries will be more if you are not properly nutritionally good then your healing of the injured muscles with every exercise some wear and tear occurs, that will not be healed properly. So you will be prone for the injuries, and when important competition is there, so do your activity intelligently, so you can save yourself for the bigger competition and plan your activity in advance. The common concept of during the playground is RICE, or PRICE or POLICE. POLICE is the advanced, but PRICE is: Protection, then rest of that injured part, protection means he you have to protect him for further injuries, like you have to take him out from the ground, give the rest to the injured

part, apply ice and then give him a compression bandage, and elevate that injured part. In the POLICE, there is protection, and optimum loading. Optimum loading is required after acute phase, then the icing compression and the elevation. of the why the overuse injuries occur the example are these stress fractures, tendinopathy, instability which I have already you in the table there and these overuse injuries most common are the stress reactions or stress injury of the bones, and why these occurs: malalignment of joints, limb length discrepancies, because of age, sex and race some are more prone, and few persons are less prone. Then, the hard surface are more prone for these stress reactions. Training all of a sudden, if you give excessive training load then the chances of injuries are more than the faulty sports gear. The modifiable factors for the bones are the biomechanical, training surface, sports and the muscle factor and the factors which resist for the fractures are the energy availability of calcium and vitamin D, and training history. How do you diagnose? By examination, history must be history of your overuse and with the help of investigations like x-ray and MRI. MRI is gives you a clear-cut picture and either T2 images or in the T1 images there will be a edema cortical edema in the MRI images and how you are going to manage him initially with the activity modification and identify the modifiable risk factors and then the return how you are planned to return for activities beginning with the progress in a progressive initial running if the consecutive two or three sessions are pain-free then you can increase with 10% and simultaneously change the if we are there is some biomechanical fault you can change that but keep in mind key this change will not initiate the other problem. Rehabilitation as depend on the type and site the basic principle is passive begin with the passive range pain-free range of motion then the active, then the isometric exercises then the isotonic, and then include the proprioceptive and the plyometric exercises. And then in the last, the game mimicking exercises and game specific training. Return to sports it decided by various test which is the specialized test which will be conducted by the specialist doctor and with the help of biomechanist, and when you are doing rehabilitation or you are asking some athlete for the for this rehabilitation, you must ask him to motivate himself or take a session of a sports psychologist. He will motivate him; so there will be no negative feeling of his rehabilitation or his injuries. So, sprain is a injury of ligaments, ligaments are the collagen bundles which binds two joints and their injury the common example of the ligaments are anterior cruciate ligament, and supraspinatus ligaments of the joints and the ligament of the ankle. And same principles of the POLICE and PRICE, and rehabilitation. If you go under surgery first, the optimum loading principle will be affected there and your pain free range of motion then the isometric, then the isotonic and same sequence of and it takes minimum four to six months. Strain is a injury of muscle/tendon and same the affected muscle/tendon if it is a complete tear it required surgery, and then the proper rehabilitation, and if it is not a complete tear it still it required the rehabilitation of few weeks of few weeks to few months. And same principle of POLICE and PRICE, and fracture is a acute injury and it is in two types: open and close, and it required some time it is a closed reduction and sometime it required the open reduction and internal fixation, and rehabilitation depends on the which type of. If it is a closed reduction and there is no complication, then rehabilitation will be one can return to play within

six to eight month,s and if it is open reduction internal fixation, it may take a longer duration. MTSS it is a chronic injury or overuse injury of the lower limb, it again depend on the age, training and mostly on the training load and your malalignment or your alignment of your bony structures. The diagnosis depends on the MRI. There will be a edema on the cortical surface. And the management remain the same: PRICE and RICE, and you should be very careful while using normal nonsteroidal anti-inflammatory drugs. Do not use more than a week or more than three days after three days, generally pain subsides and you can start walking or you can doing non weight-bearing exercises and you can start doing cross training. And we can use for the fast healing low intensity ultrasound and early pain free range of motion initially without then the weight bearing, and then the cross training and for cross training can use cycling or swimming that is in deep water running and if the institute is good enough and that has a anti-gravity treadmill, then we can use anti-gravity treadmill also. So thank you so much, now it finishes your sixth week. Thank you so much.