

Essentials of Sports Injury Prevention & Rehabilitation

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Lecture – 14

Treatment of Various Injuries

Good morning friends, myself Dr. Atul and today is our module's last lecture and during this lecture we will study about the treatment part of various injuries which we had studied during the previous lectures. So, and it is same the treatment part for every injury remains same. The open injuries which occur on the ground like abrasion or any kind of open wound remain the same. You have to wash under running tap water, and when the dirt is clean and blood is not oozing, then you can apply local BetaDine lotion or any antibiotic ointment and you have to cover it with bandages. Then in the closed injuries like a sprain, strain, closed fracture; you have to follow certain rules that is initial management. Earlier it was RICE, then it changed to PRIE and now the recommendation is POLICE.

As the mnemonics is self-explanatory it is RICE: that is raised, icing, compression and elevation, mean you have to give raise to that affected body part, apply ice for at least 20 minutes, not directly put some cotton cloth over the injured part and then apply ice. Why to not apply ice directly on skin; it may cause further injuries cold burn injuries also and, the compression will reduce the swelling of that affected part, elevation and compression. Then comes the PRICE: protection. Protection means you have to protect that particular area of your injured body part and giving some rest and then remaining portion is same like icing, compression and elevation.

Protection means you have to use some external splint or something which provides protection to the injured part. Then comes the latest version is POLICE: In this protection, then optimum loading, icing, compression and elevation. In this, by the meaning of protection is protecting that injured part from any kind of movement initially and as after swelling gets reduced then gives that body part as an optimum loading and simultaneously icing and compression remain same. So whenever you are on field and you see some patient or you yourself get injured; do not apply any kind of warmth, do not move your body part unnecessarily because it might hurt others or the injury got worsened.

I have seen so many patients when they come they give history. "I hurt myself on the ground and one of my colleagues just gave unnatural movement to the joint to fix the dislocation, and now I am unable to move my fingers and I am in a lot of pain". So it is better to put that body part in the rest, use some locally available splint, apply ice, if permit things allowed you then keep that body part elevated and if you have some compression clothing or compressive bandages, apply compression bandages and keep one more thing in mind while giving compression bandage. Keep your own one finger below that compressive bandage, so that it does not occlude your artery or vein, or your patient's blood flow. So, this is the primary management of any closed injuries like sprain, strain, any kind of tear or closed fracture. The treatment part will be provided in the hospital if the fracture has occurred, so it will be done in the hospital or the medical team and if some suturing is required, then suturing is also done in the hospital, and when you are planning for his rehabilitation.

So, certain points you have to keep in your mind initially when the patient is pain free and then you start your rehabilitation is: first pain free passive range of motion, then pain free active range of motion, isometric strengthening, isotonic strengthening, proprioceptive training and in the last game specific drills. So rehabilitation of that particular patient is quite systematic and a scientific approach. It is not random that you can today do isometric strengthening, tomorrow you do game specific drills. It is not like that. It is a complete sequence, and it has to be done under the close supervision of the specialist, and as soon as the patient is pain free and the medical team has allowed him for the joint movement.

So, first one has to start with passive range of motion then progress to active range of motion. Passive range of motion means when somebody is moving that joint, patient is not on his will is moving that joint. When patient is moving his joint, that is active movement; and isometric strengthening when the patient or you yourself without moving your joint tighten up or make your muscles tight, that is isometric strengthening. Isotonic, that is when weight remains fixed and the joint or the muscles which causes that movement is lifting or doing that movement under certain weight is known as isotonic strengthening. And after that or simultaneously when isotonic isometric is going, then proprioceptive training also starts.

Proprioceptive means your joint position sense, that means your balancing. When you close your eyes you are aware of which joint is in which space. And in the last, game specific drills. So these are the rehabilitation strategies under which one has to do his rehabilitation. So now we will go back to power module 1 and now I will summarize from the beginning for the upper limb and lower limb anatomy.

Upper limb consists of scapula, clavicle, humerus that is our arm bone then radius, ulna or forearm bones, our wrist bones, carpal bones there are eight in numbers arranged in two rows: (scaphoid, lunate, triquetrum, pisiform, trapezium, trapezoid, capitate, and hamate). And

metacarpals and phalanges. Our thumb has only two phalanges. The head of the metacarpal makes our knuckles. The muscles around the scapula are: periscapular muscles, rhomboid major, rhomboid minor, teres major, teres minor, supraspinatus, infraspinatus, subscapularis, serratus anterior, trapezius, sternocleidomastoid, deltoid, triceps, biceps, common flexors of forearms, common extensors of forearm, and muscles of the palm. Joints, shoulder joint: all movements (flexion, extension, abduction, adduction, horizontal abduction, horizontal adduction). Elbow, only two movements: flexion and extension, and radial joint (supination and pronation) wrist joint (adduction, abduction, flexion, extension, and circumduction).

Femur is the long bone of our lower limb. This is the largest bone and bone of thigh. Tibia and fibula, the calf muscles, calf bone, tibia is medial bone and fibula is lateral bone. Tibula gives origin to the anterior cruciate ligament and posterior cruciate ligament, and it holds the menisci. Then the tarsal bone, they are (talus, calcaneus which is heel bone, navicular, cuneiform, they are three in numbers, medial, intermediate, and lateral, cuneiform, and cuboid). And metatarsal and phalanges, same as thumb, great toe also has only two fingers, two phalanges.

And great toes, heels, and little toe play important part in weight bearing. Muscles are quadriceps muscles, hamstring muscles, gluteal muscles, iliopsoas and rectus femoris, and adductor muscles. Tibialis anterior, tibialis posterior muscles, peroneus longus, and peroneus brevis, gastrocnemius (they are two muscles, gastrocnemius and soleus), they are also known as heart of our, second heart of our body. And in the lower limb, hip joint does flexion, extension, adduction, abduction, internal and external rotation. Knee joint in normal movement is flexion and extension, when the knee is a little bit flexed, then medial and lateral rotation.

At the ankle, dorsiflexion, plantar flexion, inversion, and eversion are the movements. And on the phalanges, flexion and extension. Common injuries are, abrasion, that is disruption of skin, sprain, injury of ligament, strain and contusion, injury of muscles, dislocation and subluxation. Dislocation is disruption of the joint, and subluxation is partial disruption of joint fracture, discontinuity of bone. That is, rotator cuff tear is a common injury of upper limb.

It is a shoulder injury. Patient comes with pain, may or may not have swelling, and he is unable to lift his hand above the shoulder, and sometimes he complains of impingement. He says “something is coming in between my shoulder”. Something is squeezing my shoulder muscles, or he complains like that. In tennis elbow, it's a lateral side pain at the elbow. It is a common extensor tendinitis. And in the golfer elbow, medial side pain at the elbow. It is a common flexor tendinitis. In wrist sprain, when you lift weight without activating your wrist muscles and forearm muscles, that time you suffer from sprain. Hamstring strain, hamstring muscles is strained when you want to take the sudden burst of excessive energy or excessive power, and your muscles are not able to handle that power, then this strain occurs.

ACL and PCL tear occurs, and they are powerful ligaments, and they are very thick ligaments due to very high force. These injuries occur in the acceleration and sudden twisting. Meniscal tear, it also occurs in the twisting injuries, and as you grow older, gradually the hydration of these menisci get less and the chances of injuries increases. Ankle sprain: sudden movement of ankle or sudden twisting of the ankle causes ankle sprain. Now come the common causes of injuries.

Unavoidable circumstances like your sports, such as contact sports, so some hockey sticks can hurt you or your opponent's foot can hurt your legs, your thighs or sometimes intentionally they make scratches on your body part, so these are the unavoidable circumstances. Inadequate warm-up: when you become so confident, "I do not require warm-up" or you are in a hurry and you just do two minutes warm-up and you start playing continuously, then you might get hurt. Overuse injuries are the injuries which occur due to overuse like supraspinatus injuries or rotator cuff tears. Improper gear, like your shoe size is 8, and you are wearing shoe size of 7 or you are wearing shoe of 9 number.

You are playing with a new racket or you are not aware, you don't know what is the size or what is the length of your racket and you start playing a racket game without selecting a proper racket. Improper surfaces, like when you shift from one surface to other surface, from clay court to grass court, grass court to synthetic court, then these kinds of injuries may occur. Wet outer field and slippery surfaces, chances of increased injuries. Using wrong techniques, learning on their own or under not professionally qualified coaches or coaches, over or under training, lifting too much weight, you have just started your gym training or your strength training and all of a sudden you started very high weights, so there might be chances you hurt yourself. So what will be the treatment strategy at the ground: RICE, PRICE or POLICE whatever is available you should use that.

The rest protection and optimum loading. Ice, icing, compression and elevation always remain the same in every treatment, and wherever you see a close injury or you should apply first ice, compress and then elevate that body part. And the general principles of rehabilitation in upper limb and lower limb is first we have to achieve pain free range of motion, both first passive range of motion, then active range of motion and then we have to proceed for the isometric strengthening of the body part, then the isotonic strengthening, isotonic means using some weight or some resistance band and then we have to do proprioceptive training and game specific training. So in this module we have learned about various basic of upper and lower limb anatomy, types of common causes of injuries and the primary treatment of injuries. So thank you very much.