

Gymnastics wrist injury case study nursing essay



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Anne is a 14 year old gymnast who presents with left wrist pain 4 weeks after an original injury. She completed a tumbling manoeuvre and felt a stabbing pain in her wrist, which has been throbbing for 1 week. She went for x rays, which found no fractures. She took several days off training and the pain subsided for the most part. Her coach strapped her wrist and she has been trying to avoid direct impact moves but this has only been partially successful. The wrist has been diagnosed as a sprain but the pain is preventing Anne from doing any weight bearing on her arms.

Gymnastic sports: The impact on the wrist is higher than any other joint, particularly in this sports the involvement of the upper limb is very much severe because of the weight bearing support of the body as a closed chain kinematic, in which the wrist joint was not meant to be. Getting injured at wrist is the most common scenario, the most common injuries involves ligament sprain and laxity, carpal fracture and compression syndrome.

History:

Since the duration of the injury is 4weeks therefore it cannot be a muscular sprain, and there is no obvious symptom of fracture. Therefore it can be a sprain. A careful evaluation of the signs and symptoms both subjective and objective assessment involves.

Onset of the pain, Location of the pain with or without movements,

Duration, Character of the pain like sharp, throbbing, dull, etc,

Releaving/Aggravating factors

Radiating to any other site, temporal pattern like every night, morning, all day, etc. (Todd 2006)

Objective assessment involves palpation for tenderness, stiffness, observation for swelling and redness or erythema, active and passive range of motion of the wrist joint, deformity etc.

Pathophysiology:

Anne was diagnosed with wrist sprain. Sprain is an ligament associated injury and is very common among athletes. Ligaments were the connective tissues which connect and stabilize from one bone to another bone; they could be very strong and made up of cartilaginous matrix. The degree of ligament injury depends on the severity of the injury. Sprains are classified majorly into three types: Grade I which is a micro tear or rupture of a ligament; Grade II which is a partial tearing/ excessive stretching; and Grade III is a complete or full rupture/tear of the ligament with or within the mid-portion of the ligament, or it can also be an avulsion fracture (“ pulling away”) from its respective attachment to bone. A sprain also has the tendency to upset the normal rhythm of coordinated movements the wrist bones in which it results in persistent symptoms like stiffness, tenderness, swelling, pain and possibly joint instability.

Occurrence of sprain can possibly due to excessive loading of force transmitted across the wrist joint. These occur as the result of a fall of outstretched hand. In gymnastic sports the force is applied in such a way with violent twisting injury or a torsion force. There are many ligaments stabilizing the wrist joint by binding the eight carpal bones to the radius and

Meta carpal joints for multidirectional movements. One of the most common ligament injuries involves the scapho-lunate ligament, this ligament which connects the scaphoid and lunate bones. In gymnast sports dorsal wrist impingement occurs when the posterior or back of the radius strikes with the carpal bones, especially during the performance of walkovers or handsprings. This injury is the result of prolonged extension thereby stretching force of the joint beyond stressed to its normal range of motion which is also known as hyperextension. Force placed at the joint or on the bone especially during axial loading, which can also cause wrist sprain. The injury is aggravated when the full weight is placed on the wrist while doing handstands on the balance beam or on the vault.

Aetiology:

Due to enormous amounts of pressure and weight loading placed on gymnast wrists, there is great potential for getting injured. Many gymnastics routines involve ballistic, jerking and repetitive movements of the wrists and hands while loading. Carrying whole bodyweight at the wrist, especially when the wrist extending backward to support a handstand can end up in fractures sometimes and in majority of cases suffers with sprains and dislocations, any of these conditions can end up with chronic long-term effects in recovery. Most gymnastics injuries were managed in much the same ways as any other sports injuries, there are about two major chronic injuries called the dorsal wrist impingement and the distal radial stress fracture which requires a special medical attention for management.

Dorsal Wrist Impingement

Dorsal wrist impingement is the most common injury among gymnast and it occurs when the dorsum of the radius impinges with the other carpal bones especially during the gymnast techniques like walkovers or handsprings. The mechanism of this injury is the result of constant wrist extension or stretching of the joint beyond its normal range of motion while loading, which is also known as hyperextension. The force placed along with the loading of the joint during weight bearing, can also cause this condition and the injury is aggravated whenever the body weight placed at the wrist while performing techniques like handstands on the vault or balance beam. (David. C. Rehak, 2009)

Diagnosis:

The diagnosis includes a careful patient history by assessing the possible cause of injury like how the injury occurred, duration , position of the joint, weight bearing force followed by a valid clinical examination followed by the signs and symptoms or special test to identify the particular ligament injury, and finally diagnostic testing by ultrasound scans or X-rays. Usually patient typically presents with the chief complaints of wrist pain and stiffness, and followed by loss of strength is a common symptom. Examination of the wrist will allow pinpointing the tenderness and thus localizing the site of injury, and also to assess wrist stability. Usually X-rays of scans were obtained to evaluate any potential fractures or for signs of ligament insufficiency, ligaments alone were cannot be seen on X-rays, the consequence of a ligament injury may be appreciated indirectly based on abnormal alignment of the wrist bones. Furthermore additional diagnostic testing may be required like MRI or an MRI-arthrogram if possible. Potential risks and

benefits of the surgery must be considered relative to the severity of the wrist injury.

The potential aim of the treatment should be:

- Providing pain relief.
- Minimizing the stiffness or loss of motion.
- Immobilization if needed.
- Restore wrist joint stability and movements.
- Reduce the risk of long-term consequences like contracture, arthritis, pain, instability.

Sprained Wrist – Early Management:

P. R. I. C. E protocol is the first line treatment of a sprained wrist. This includes:

Prevention. Golden rule prevention is always better than cure. Have adequate warm-ups and cool down, wear protective gear while practicing new techniques. Wearing protective gear, such as wrist straps or guards, may help prevent wrist sprains. Maintenance of appropriate weight to prevent the overloading (William J. Morgan, 2001)

Rest. Stop activity, then immobilize with a padding or splint and don't use the injured wrist for the next 48 hours or until the tenderness, pain and swelling should reduced.

Ice. Icing is the best first aid for the wrist injury, applying a cold pack wrapped in a towel / bag of crushed ice to the wrist for about 10-15 minutes each session, for some days until swelling subsides.

Compression. Elastic compression or creep bandages should be used to wrap the wrist to limit swelling. The wrap should start at the base of the fingers to drain the inflammatory fluids and stop just below the elbow. The wrap should not be a tourniquet, should be careful not to cut off blood circulation to the fingers.

Elevation. Keeping the injured wrist higher than your heart as often as possible during the night as well as some time of the day for the first two days after the injury. This will help to drain out the accumulation oedematic fluid and thereby reduce swelling in and around the wrist. (William J. Morgan, 2001)

Further treatment involves

Over-the-counter drugs. These may include analgesics like Ibuprofen (Motrin, Advil), Naproxen, Acetaminophen, paracetamol or aspirin.

Bracing. Doctor may recommend using a brace to immobilize the wrist, especially when practicing the gymnast if needed.

Immobilization. In case of severe sprain, doctor may recommend a splint or cast for two to three weeks.

Rehabilitation Exercises. A physical therapy intervention needed for flexibility, range of motion maintenance, and strengthening exercises for the injured wrist.

Surgery. In some case surgical intervention may be needed to repair the torn ligament or if there is a suspected bone fracture.

Medical Treatment

Usually the wrist sprain treated with conservative means like Velcro strap or wrist splint/plaster splint (like a cast). Pains, amount of swelling, restriction of movement, were the concern about an occult or hidden fracture.

For minor sprains, a splint may not be recommended and may be told to limit activity appropriate to the level of pain range.

In case of severe sprains, Velcro wrist splint that can be taken off and a rigid casting may be helpful for complete immobilization. (Jonathan L. Gelfand, 2010).

In severe case a steroidal injection may be injected on the sight of injury to reduce pain, the injection is commonly called as cortisone.

Surgical management:

Surgery is recommended when there is a complete rupture or full tear of the ligament.

Percutaneous pinning repair of the ligaments or ligament reconstruction-

This procedure involves by identifying the torn ligament and reconstructing

with tendon graft which is used to replace the ligaments which has been torn.

Fusion of joints suggested if the ligament instability is discovered since long after the injury and producing the unstable bones, a fusion of carpal bones may be suggested in advance instability.

After the surgery, the first few treatment sessions the management should be focused on controlling the pain and swelling following after surgery.

Initially start with an exercise that helps in strengthening and stabilizing the muscles around the wrist joint. Following after those other supplementary exercises are also used to improve the fine motor control and finger dexterity for the hand. (seed, 2006)

Wrist Exercises

Hand exercises should be focused on full range of motion with the natural 3-dimensional range of motion. Along with that resistance helps in strength, conditions and balances for the tissues of the hand, wrist, fingers and forearm as well.

Spread the fingers apart and close them several times

Place wrist firmly on a table and repeat ulna and radial deviation.

Place the hand palm facing downwards on a table and lift each finger in turn.

Squeeze a stress ball or a rubber ball, hold for a count of ten minimum and release the grip.

Supination, pronation movements should be encouraged along with thumb movements like picking coins and placing on the other side.

Proper stretching of flexors and extensor of the wrist is recommended to prevent soreness.

Inserting the wrist in a tub of warm water encourages the movement by reducing the pain and stiffness.

Stress ball or pan cake pressing and making moulds helps in improving dexterity of the fingers.

Periodic flexibility and stretching of the fingers and wrist is recommended daily to improve the range of movement.

Joint glides and passive range of motion movements should be done by gliding the joints with the unaffected side of the fingers.

Using a rubber band splint or rubber band resistance can improve in gaining the strength of the wrist and fingers.(Hologum. P 2005)

Repeat the exercises regularly during the day as long as there is no pain or discomfort and in night wear a splint to reduce abnormal movement or lying on the injured wrist.

Advanced exercises

Throw a ball against a wall later catching the ball, for making more increasing the distance.

Banging the wall with the wrist will be helpful before loading the wrist completely.

Healing time frame:

Ligaments are made of strong, and have high resistance to length tensile relationship, when stretched often it takes a long time to heal. Wrist sprain healing time varies from person to person due to their wrist stress, usage, degree of damage. Some injury can recover within a few days and others it takes up to several weeks for it. Early treatment results in early healing, approximately the entire healing process may take about 3 - 10 weeks.

Average healing times are:

- Mild sprains-2 to 6 weeks.
- Moderate sprains-6 to 8 weeks.
- Severe sprains-8 to 10 weeks. (Mukherjee, 2010)