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## Closed chain exercises for knee acl

Check out the details of various joint problems and treatments, including medications, surgery, physiotherapy and rehabilitation. Reading will help you understand more about your condition. There is also a glossary with explanations for many medical terms used in orthopedics. You can learn more by following the link page to other relevant websites, journals, or professional medical associations. Hover over the links below to view the summary, or click the link to view the entire article: 3 Specific rehabilitation exercises for ACL reconstruction Overall management of rehabilitation exercises should be performed regularly. This should include a certain exercise every hour and a more defined 30-minute session perhaps 4 or 5 times a day. Analgesia or pain medication planning should be adjusted so that perhaps 30 minutes before the exercise program. If anti-inflammatory drugs have been prescribed then this can also be taken perhaps 30 minutes before an exercise session. An ice pack or bag of frozen pees is very important for 10 minutes after controlling any effects of swelling. Exercise can cause some discomfort, but should not cause pain or severe swelling of the knee. Open and closed kinetic circuit exercises Open kinetic circuit exercises include knee attachment and foot movement, often against resistance (e.g. knee extensions in the gym, football kicking, etc.). All exercises create stress through ACL graft, closed circuit exercises in general cause less stress on new vaccines. Straight leg lifting exercises are open to the circuit, but promote low stress ACL only meets 200N or level walking. This is a safe and useful exercise in early ACL reconstruction rehabilitation. The strength of graft fixation in bone-patellar-tendon bone grafts using screws is such that active straight leg enhancement exercises can be performed immediately. If the hamstring graft has been used for fixation is a little less safe, please consult mr. Johnson, when the open chain straight leg lifting exercises can be started. Quadriceps and hamstring activation exercises After ACL reconstruction this is a natural response of the body to suppress both hamstring and quadriceps muscle activity. This occurs in the reconstruction of both types of ligaments. Obviously, hamstring weakness is higher when the hamstring tendon was removed and used to replace the ACL. When the patellar tendon part was taken from the front of the knee quadrilateral weakness and pain is more common. These muscles should be activated and used for exercise and mobilization. Good muscle control is necessary for safe mobilisation and supports reconstructed ACL. Quadriceps Activation: If there is a good straight leg lift then good performance level impossible or allowed patients should be asked to contract quadriceps to make a stand out and compared to the other side. Frequent wasting most of the muscle was before surgery, but often little or no contraction is possible. Patients should work alternately on contracting and relaxing muscles and then progressing straight leg enhancement or knee extension exercises as described below. In addition, on a good road it is possible to demonstrate a rapid twitching of the lower quadrilaterals, which causes the twitching of the patella or knee cap. Then it should be promoted and achieved on the controlled leg. This reactivates the muscles and gives some control of contraction and relaxation. These exercises should be repeated with the leg wrapped so that the medial or inner part of the quadriceps is used, as well as with the leg wrapped inside to use the lateral muscles of quadriceps. Hamstring activation: When a hamstring tendon has been removed there may be significant weakness in the hamstring muscles. If semi-tendons and gracilis tendons have been used, patients may be unable to lift the foot off the floor behind them for several weeks. However, the obstacle should be activated in the early phase of recovery. This is achieved by using hamstrings with a foot sitting or lying downright to press the heel into bed or sofa. The knee may be allowed to bend perhaps 10°. This contraction should be maintained for an increasing amount of time from 3 seconds to 5 and 10 seconds before relaxing. Exercise may need to be demonstrated using a good leg. This exercise should be repeated with the foot reeling so as to use the lateral or outer part of the hamstrings and also with the foot rolled inward so that the medial hamstring muscles are used. EXTENSION EXERCISES: Knee extension exercises are necessary in early rehabilitation to ensure that complete road extension is restored as soon as possible. Extension exercises can be performed in patients with bone patellar-tendon bone ACL graft immediately after surgery and usually after the reconstruction of the hamstring tendons. The following exercises should be used regularly during the direct postoperative period: A(a), A(b), B(a), B(b), C and D(a), D(b). Passive extension: Lie on your back with a wrapped towel or hold under the heel. Let the foot hang your fingers pointing at the ceiling. This allows the road to be slowly straightened in 3-5 minutes. In the same position after 3-5 minutes, use the hamstring muscles to straighten the knee, forcing the heel to open and straighten the knee as far as possible. When displayed and demonstrated by p. Johnson or your physiotherapist push down the road with your hands on the front of the road forcing the road further straight. 2007 position when it is proven that something gently but firmly press on the front of the knee to help the knee gently and firmly straighten. Gently apply and release the force so as not to cause pain, distress or resistance to muscle reactions. Legs hanging lying: When the knee is in a full extension position lying on the back with a wrapped towel or support under your heel. Raise your leg with a straight leg. Keep the heel away from the bed or headphones and hold this position for 3 seconds before gently lowering the leg. Repeat the exercise 3-5 times. Perform the same exercise with fingers pointing not to the ceiling, but to turn outwards 30 degrees. As muscle strength increases the above exercises can be taken, but while constantly raised the knee can be bent 20 degrees before straightening again before repeating and then dropping the foot to rest on the bed again. Hanging the legs while sitting: The above exercises should be repeated in a sitting position when the knee rests on the chair. Legs hang in a prone position: Lying on the front with a foot extending over the back of the sofa or bed. Allow the foot to hang your fingers pointing to the floor. This allows the road to be slowly straightened in 3-5 minutes. In the same position after 3-5 minutes, use quadriceps muscles to straighten the knee, pushing the heel down towards the ground and straightening the knee as far as possible. When displayed and demonstrated by p. Johnson or your physiotherapist needs something gentle but firmly pressed on the heel to help the knee gently and firmly straighten. Gently apply and release the force so as not to cause pain, distress or resistance to muscle reactions. EARLY FLEXION EXERCISES: Knee bending exercises Simple knee folding should be started immediately after surgery. Lying in bed, the knee can be bent and then lengthened back to the rest position. Usually the knee folding range is 30°-50° is possible on the first day. If you are able to sit down comfortably, the road can be allowed to bend over the side of the bed. If the knee is painful to lift, then the other leg can be used to lift the controlled leg above the side of the bed. If the feet of good legs are located under the wrong leg ankle and then used to help lift the foot above the side of the bed. Then a slow knee can be allowed to bend perhaps 50°-70° degrees. The extension (straightening) of the road from this situation is usually possible to some degree. Mobilization and walking: When such a degree of muscle control is achieved, it is possible to safely mobilize and walk. Initially, this should be accompanied by a physiotherapist or nurse and may need to use crutches. Patients receiving a hamstring graft reconstruction are usually less uncomfortable and require less analgesia or pain relief. Some patients who are mobile safely on crutches with good pain can be discharged from the hospital within 24 hours. For most patients and when bone patellar tendon bone graft has been used for a one or two-night hospital stay is more common. Crutches can be thrown away when advised by a physiotherapist usually within 2-4 days, although they can be useful when walking outside a little longer. Braces: After op motion, the range of knee braces can be used for support. This is usually found to be able to full range of motion. The success of the reconstruction procedure depends entirely on proper positioning and tension in vaccines. Initial fixation, especially when a striated graft was used, is a vulnerable and weakest part of reconstruction. Braces are often given to protect the road and to ensure some stability during the first few weeks of mobilisation. It can be removed for cleaning and performing exercises or physiotherapy. Sometimes it is useful to lock braces with a knee straight at night for the first few weeks, as this promotes and maintains a complete extension of the road and facilitates mobilization in the mornings. Once more complex review procedures have been undertaken to restore the ACL, this post-op knee brace can be exchanged after 3-4 weeks of ACL stabilizing braces, which will protect and support graft throughout the rehabilitation period. Such a splint is also used for returning to manual work to provide additional support in the early rehabilitation phase. FLEXION EXERCISES: Knee bending exercises After the first few days, when the pain and discomfort have settled, the swelling has decreased and patients walk comfortably with more progressive knee flexibility exercises. These exercises include: foot slide: sit on a chair with your foot right in front of you. Push your foot along the floor towards you using your hamstring muscles. Sitting bending. Sit on the edge of the bed or table when the foot hangs on the ground. Gently relax the muscles of the quadriceps (thigh muscles) so that the knee can gently bend. Try to deliberately relax the quadriceps muscles so that you can slightly more knee bend each time. Using your quadriceps muscles gently straighten the knee again before repeating the exercise. Bending the wall. Lie on your back with your foot right against the wall. Gently push your foot down the wall until it is bent. Return the foot to the starting position with your hands. Lower slide: In patients who are two or three weeks after surgery, it is p. Johnson preferred exercise to promote a good track bending. Patients should sit in a high chair or dining chair, and the foot rests on the ground. The path should be actively curved sliding foot along the floor or carpet, as in the foot slide exercise. When the maximum knee bending quantity was reached with both knees bent and the legs flat on the floor. Patient you need to use your hands to lift your bottom a little from the chair. Then the patient moves his bottom forward perhaps five centimeters toward the front of the chair before sitting in that position. In this way, patients' body weight is used to achieve a few more degrees of knee bending. After the position is held for 10 seconds, the weapons can be re-used to return to position further back into the chair. In the first few days, some random patients have pain that limits their mobility and comfort, then a permanent passive motion machine (CPM) can be beneficial. It is often used in the 40° knee bending range and gradually increases the range to 90° in the first few days. Most patients do not require and do not benefit from the use of the CPM machine. KNEE CAP MOBILISATION Fabrics around the patellar can become swollen thick and scarred. This is more common after the use of BPTB ACL graft. It is important for these patients to promote and maintain normal mobility of the female. In this exercise, sit with the legs from the front. It is very important to promote and promote the relaxation of quadriceps. Use your thumbs on the outside of the knee to push it through firmly inside. Hold for 5-10 seconds, then slowly release. Repeat this 5 times. The exercise should be repeated with equal enthusiasm, pushing the knee atoll sideways or outwards, pressing the thumbs to the inner side of the road. This should also be repeated by pushing the road up and down in order to encourage the mobility of all round patellar. VASTUS MEDIALIS OBLIQUE (VMO) VMO muscles are the inner most or medial aspect of the lower quadriceps muscle in the inner side of the lower thigh. This muscle helps to control the position of the knee. Postoperative swelling and pain quickly reduce muscle function. These exercises are designed to activate and strengthen this muscle. Quadriceps Activation: As described above quadriceps activation exercises should be performed by promoting good quadriceps twitching and long-term contraction with the foot to rotate outwards so that the inner or median aspect of quadriceps is used. Mini Leg Press: Sit with your foot in front of you pressed against the wall. Fold the knee perhaps 20° and push back to a straight position. VMO exercises with knee folding: Roll the thigh outwards with a pillow or wrap a towel under your knees. The goal is to enter into a contract with the VMO, while other quadriceps remain relaxed. Dig your heel into bed to contract hamstrings, then contract the inner thigh. Hold the contraction for 5 seconds, then repeat. Create a contraction of up to 10 seconds. VMO exercises in the lungs: stand with the affected foot forward and slightly bend. Hold your fingers pointing straight forward, and turn your foot to turn your knee cap outwards. Arch your foot, tighten hamstrings trying to pull the heel back along the floor (without actually allowing it to move). At the same time contract vmo on the inner thigh, while relaxing the thigh muscles. Hold each contraction for 5-10 seconds, then repeat this exercise. \* GENERAL STRENGTHENING EXERCISES As rehabilitation progresses overall exerci\* ses, fitness and strength are important. Restoring the normal gait or walking cycle, posture and function depends not only on the road. Other exercises that must be introduced within 2-4 weeks after surgery: Lying in the hamstrings: Lying on the stomach. Fold the operated leg slowly towards the buttocks as long as it will go, and then gently lower back to the rest position. Control the speed of movement up and down the road. Sitting Hamstrings: Sit with your foot out in front of you. Gently push your leg at you, use a band or elastic band of exercise around the ankle to make this exercise more difficult. Quadriceps: Sit with the knee bent 90°. Straighten the knee to 50°, hold then slowly lower. Straight legs lifts: This open circuit exercise can be performed initially in patients with BPTB ACL reconstruction, but you will be advised when it is safe to start this exercise in patients with hamstring-type ACL reconstruction. In the lying position, lift the straight leg 30cm from the bed or sofa, hold for 10 seconds before gently lowering, resting and repeating. Patiens should be encouraged to make rapid progress in order to exercise in a sitting position. Leg attachment; Lie down on the managed side with a good foot bent in front of the controlled leg. Lift the controlled leg off the ground and try to tighten the VMO. Leg Abduction: Lying on the side with the upper leg of the surgery. Hold your leg straight and under the body (do not bend the hip forward). Raise the leg 30cm. Hold for 3 seconds and gently lower, rest and repeat. Hip extension: lying on the stomach. Hold the knees straight, tighten the muscles of the stomach and lift the whole leg from the bed. Hold in this position for 3 seconds and slowly lower to the rest position. Hip extension with knee bent: perform the exercise as described above with the knee bent. Hold for 3 seconds, rest less and repeat. Bridging: Lying on your back lift the pelvis from the floor(your shoulders and arms remain in contact with the floor). Progress with only a controlled leg to lift the bowl from the floor. Calf lifts: Standing on the headphones, holding the knees straight, slowly rises on the back fingers. Slowly lower, rest and repeat. Patients should be encouraged to progress with only the affected leg. Make sure that the road is kept straight during the test. Wall slides: While standing flat with your back against the wall with both legs flat on the ground perhaps 30cm from the wall. Slowly inject bend the sliding back down the wall and back to the rest position. Initially, the road should be allowed to bend only perhaps 20°-40°. After 4 weeks, a 60° interval should be reached, and after 6 weeks - deep bending of the knee to 90°. Patients should only be encouraged to make progress by using surgery during knee support during exercise. Dips and one leg dips: Standing, holding onto the headphones, Slowly let the roads bend the position a second time and straighten back to the rest position. Initially, the road should be allowed to bend only perhaps 20°. After 4 weeks, it is necessary to achieve 40° anger, and after 6 weeks - deep bending of the knee to 60°. Patients should only be encouraged to make progress by using surgery during knee support during exercise. Squats: This should be taken in a similar way to dips exercise using both legs, but with feet separate and fingers and knees pointing outwards. Step up and step down exercises: This exercise should initially be performed for a 2-4 week postoperative period using a small step of 10-15cm. Step aerobics step is ideal. Accelerate and accelerate exercises should be performed using both legs. Need gentle slow and controlled movement, which controls the action of quadriceps throughout the exercise. Exercises should be performed perhaps for 5 minutes 4-5 times a day. Static exercise bike: Static exercise bike is a very useful tool for rehabilitation. Even if patients do not have the required degree of knee folding to fully trim the pedal pedal, it promotes knee flexibility. With saddle high patients can be encouraged to achieve circumcision within the first 2-4 weeks. Then, on each progressive day, the saddle can be lowered to stimulate the increasing degree of knee folding. The exercise is a closed kinetic circuit and therefore a low voltage applies to the reconstructed ACL graft. After reaching circumcision, the bike can be used for general exercises and leg straightening. It should initially be a short 5-minute session without resistance. If pain or swelling occurs then too much exercise has been taken. If comfortable then gradual duration and resistance can be increased every day. Rowing machine: The rowing machine is a closed kinetic exercise, so the reconstructed ACL transplant is subject to low voltage. This exercise should be used after perhaps 2-4 weeks, initially be for short 5-minute sessions without resistance and limited 30° knee bending. If pain or swelling occurs then too much exercise has been taken. If comfortable then gradual duration, resistance and degree of knee bending can be increased every day. Nordic walking: Standing, holding a blind, a Nordic walker is a good indoor kinetic circuit exercise to improve the style, strength and style of walking or gait. This should be used after perhaps 2-4 weeks, initially for short 5-minute sessions without resistance and limited bending of the 30° knee. If pain or swelling occurs then too much exercise has been taken. If comfortable then gradual duration, resistance and degree of knee bending can be increased every day. Cross Trainer: This exercise requires greater basic stability, balance and strength. Therefore, exercise should be postponed to 6-8 weeks after surgery. Before using, make sure you have the required degree of knee folding to use this machine. The machine must be used when standing, holding on the handles of the accodation, using the minimum resistance. This exercise should not be started up to 6 weeks after surgery. Initially, it should be used for short 5-minute sessions without resistance and a limited bending of the 30° track. If pain or swelling occurs then too much exercise has been taken. If comfortable then gradual duration, resistance and degree of knee bending can be increased every day. Stepper: The use of stepper machines requires greater basic stability, balance and strength. In addition, the exercise puts a significant strain on the patellar tendon. If the reconstruction of the BPTB ACL has been performed, this exercise should be performed gently with little or no resistance during the first 8 weeks after surgery. With a small tenure and low resilience. Therefore, the use of a poseper apparatus should be postponed to 6-8 weeks after surgery. Before using, make sure that you have the required degree of knee folding for the use of this machine. The machine must be used when standing, holding on the handles of the accodation, using the minimum resistance. The exercise should initially be used for short 5-minute sessions without resistance and limited 30° knee bending. If pain or swelling occurs then too much exercise has been taken. If comfortable then gradual duration, resistance and degree of knee bending can be increased every day. PRORIOCEPTIVE EXERCISES AFTER ACLRECONSTRUCTION: Balance and proprioceptive training are very important components of the ACLrehabilitation program. Balance is important for stability and for further damage avoidance. Ligament balance or proprioceptive sensors are damaged after a knee injury, periods or knee instability and after ACL reconstruction. The sensation and balance of the position should be retrained. Gradually, the protective reflexes of the body must also be retrained before returning to full function and sports. This is the ultimate achievement of 90% of normal strength and complete balance and proprioceptive reflexes, which determine when the patient can return to the sport. One foot stands: These exercises can be performed from the first day after surgery. A quick and easy way to perform daily proprioception and balancing exercises is to on one leg when cleaning your teeth. This gives you regular access to proprioception for several minutes, a couple of times a day. Even if at first you have poor balance and proprioception, you can perform exercises by holding the sink with the opposite hand. As your skill level improves you can progress at hand exercises. Another level of skill includes the same exercise, but with closed eyes, which can feel strange and will require some practice. When these exercises become too tight, try to bend in different directions (standing on one leg and cleaning your teeth), and then stabilize yourself without losing balance. This will allow you not only to master skills or stand in one place, but also to match the ability to balance when the center of gravity moves. In addition, remember that brushing teeth up and down and sideways are very different proprioceptive exercises. Try to put your socks while standing on the other leg. Wall stand: Standing on a controlled leg with closed eyes. With one finger, touch the wall by slowly moving the body in a circle around the main axis. Repeat the exercise by standing on the controlled leg until it is bent perhaps 20°. PILATES EXERCISES ACL REHABILITATION: Pilates exercises are a series of exercises that have been specially designed for dancers. The exercise focuses on basic stability. This strengthens and stability of the central muscles and around of the spine, pelvis and shoulder straps. Exercise to increase flexibility, strength and balance or proprioception, which is very important for ACLinjuries rehabilitation. Exercise is usually quite complex and instruction from your physiotherapist or Pilates instructor may be required. As a rule, these exercises can be started 4-6 weeks after surgery. Pilot one leg stretch: Lying on the back with a few bent and slightly apart and legs flat on the floor. The muscles of the abdomen and pelvis should be slowly collapsed, and one foot is straightened along the floor and then slowly bent. Then, before repeating, you need to use the next leg, then rest in a relaxed position. Pilot Ball Exercises: Place a large 80cm diameter pilates ball against the wall. Standing in front of the ball with his feet wide appart. Feel the ball behind your hands. Stabilize the ball as you gently sit on the ball. Find a stable position. With your feet flat on the floor use your feet to balance. Progress using the legs slowly and steadily move the ball into a small circle from the wall and back to the beginning. Repeat the exercise in the other direction. Before you start, proceed to the transfer of the ball from the wall. Finally, perform the exercise, partially lifting the unactivated leg and then completely off the ground. Slowly. Balance and control from the controlled leg will be improved. Be careful to fall off the ball, move too fast or too far, and be careful when you get in and out of the ball. Pilates shoulder bridge: lying on the back with a few bent a little distance from each other and legs on the floor. The muscles of the abdomen and pelvis should be slowly shrinked, and the bowl is slowly lifted a little distance from the floor. Then slowly the lower part of the back is lifted, and then the chest so that the head, shoulders and legs remain on the floor. Slowly change the exercise back to the rest position. As strength and control increase in a few weeks, the exercise can be repeated, and when the foot is uncontrolled in the bridge position can be lifted off the ground leaving the cut and balancing only from the controlled leg. A good foot should be changed before returning to the resting position. This should be tested perhaps only after 6 weeks. With time, the exercise can be repeated only using a controlled leg throughout the exercise. © D P Johnson 2008 www.Bristol-Knee-Clinic.co.uk By: DAVID P JOHNSON MB CHB FRCS. MD Consultant orthopaedics www.Bristol-Knee-Clinic.co.uk full text pdf Disclaimer: The opinions expressed in this article are not necessarily orthopedic opinions on the Internet or the opinion of the author. 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