MEDULLARY NAILING pdf

1: AO Surgery Reference

An intramedullary rod, also known as an intramedullary nail (IM nail) or inter-locking nail or KÃ¼ntscher nail (without proximal or distal fixation), is a metal rod forced into the medullary cavity of a bone.

A doctor applies casts, braces, or splints around the affected area in order to hold the broken bone securely in position and provide support while the body repairs itself. Your doctor has provided you with this booklet to answer some of the questions you may have about your broken bone and fracture treatment. It will also help you better understand what to typically expect over the next few days and weeks as you leave the hospital, begin physical therapy and follow up with your orthopaedic surgeon and physical therapist. What is an Intramedullary Nail? To align the fractured bones and provide optimal healing support, the orthopaedic surgeon makes a small incision through the skin and tissue closest to one end of the broken bones. The surgeon then inserts a small rod-like nail device into the hollow center of the bone, called the medullary cavity. The intramedullary nail forms a self-contained internal splint to stabilize the fracture. This is often done for fractures of the tibia see below , femur thigh , and humerus shoulder. Potential Advantages of the Intramedullary Nail Provides durable, strong and flexible support. Allows more exact alignment of the fractured bones for faster healing and may lead to earlier weightbearing. In the Hospital, What Now? The full length of your care may span several months. Rehabilitation will begin in the hospital and continue with outpatient physical therapy sessions, as well as at home. Understanding your care may help you feel more comfortable throughout the healing process. How do I care for the new incision sites? At first, a hospital medical professional will take care of your incision sites. Like any other wound, they must be cared for every day to avoid complications that may include infection. As your health allows, you will probably learn how to care for the incision sites yourself. Where Do I Go from Here? Following surgery, your surgeon will take X-rays every few weeks to confirm that the fracture is healing appropriately. Keep in mind that everyone heals differently. You will heal at your own pace based upon a number of factors that your surgeon can discuss with you. Your surgeon will keep you informed about your progress each step of the way. How does physical therapy help me heal? Since motion and muscle strength play an important role in fracture healing, the right exercises can significantly aid in your recovery. Of course, the fracture itself may hinder the use of your injured limb. A physical therapist will work closely with you to select the most appropriate treatment and exercises to help you restore your range of motion and rebuild muscle strength. Prior to being discharged, be sure to ask for an at-home recovery plan. Should you have questions later, contact your surgeon directly. The information that follows can help you make a smooth transition home while your fracture heals. How do I care for the healing incision sites? You may find it helpful to enlist the support of a friend or family member while you adjust to caring for yourself at home. You will need clean gauze pads or a clean cloth, plain soap, clean water, clean towels and a shower or hand sprayer to clean and protect your incision sites while they heal. Most patients prefer using the shower in the bathroom, but you will use a location where you feel the most secure and have access to a faucet sprayer or spray bottle. This is what your doctor will typically advise: Spread all of your supplies on a clean towel for easy access. Either sit on a stool in the shower or use the spray faucet or spray bottle in the sink. Remove the bandages from the incision sites. Gently wipe away any dried blood with a saline-moistened gauze pad. Inspect the sites for signs of infection such as redness, excessive or prolonged drainage, or pus. Place a fresh, dry dressing on the site and secure it. Once the incision has closed and all drainage stops, the bandages do not have to be replaced and the incision site can remain open to the air. Wet the incision sites with clean lukewarm water. Clean the sites with soap and water using a gauze pad or clean cloth. Dry the skin with a clean towel or gauze. Let any remaining secretions dry. If the site is still draining, place a clean, dry gauze pad over the site and secure it. What precautions should I take? Your physician will advise you based on your injury and recovery. Remember the instructions from your orthopaedic surgeon with regard to mobilization, weightbearing and physical therapy. Be careful with stairs, rugs and loose shoelaces. Avoid contact with animals. Avoid contact with dust and dirt. Avoid unnecessary handling of your incision sites. What if I suspect a skin infection? Even if you follow all the precautions, the skin around the incision

sites may become infected. If these symptoms progress, contact your physician. You may require oral antibiotics to control the infection. Will your nail be removed? In general, after a year the soft tissues improve and the fracture heals enough that your orthopaedic surgeon may remove the intramedullary nail. When your doctor decides the time is right, the nail may be removed in either an outpatient or day surgery center. For more information, contact your physician.

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2: Intramedullary nail - All medical device manufacturers - Videos

Introduction. Intramedullary nail fixation has become the standard of treatment for both femoral and tibial shaft fractures, with reported union rates for the femur approaching 97%.1,2 Because of this success and the ease of intramedullary nailing, the indications for this procedure have been expanded to include the periarticular portions of the long bones.

It is called intramedullary nailing because a metal rod forced into the medullary cavity of a bone to fix the fractures. Intramedullary nailing is commonly used to fix the long bone fractures. As of today there are many types of nails available. Nails made for specific fracture patterns are also available now. For example Recon nail for fracture of subtrochanteric region. An intramedullary nail functions as a form of internal splint which stabilizes long bone fracture with minimal damage to the surrounding soft tissues. Because they are sturdy and usually approximately round in shape, they withstand the heavy load of the body well in any direction, rather like the bone itself. Limbs with nailed fractures may be mobilized early after surgery with weight bearing before bony union. It was a nail with triangular or cloverleaf cut-section without any locking mechanism. Most of the modern nails come with locking mechanism. Locking is a process of fixing the nail to the bone using premade holes in the nail both on proximal and distal end of the nail for a stable fixation. Nails which can be locked are called interlocking nails. Nails are made of stainless steel and titanium Locked intramedullary nailing is the standard today. Biomechanics of Intramedullary Nailing The length of a nail that transmits load from one main fragment of a fractured bone to the other is known as the working length. Stiffness of a nail in both rotation and bending is related inversely to its working length. Nails may be either solid or hollow. Solid nails are stronger than hollow ones of the same diameter simply because they have more metal for their volume. Hollow nails are less stiff in bending than solid ones, although their stiffness may be altered by making the walls thicker or thinner. The thicker the wall the stronger and stiffer the nail. This slight flexibility does not affect the rigidity of nail to support the broken bone. Very stiff nails may damage the bone if there is any discrepancy between the nail of a shape and that of the bone. Nails are of a standard shape but people are not, even after reaming. One way of reducing stiffness is to put a longitudinal slot in the wall of a nail. This makes it much more flexible but does so at the cost of it losing overall bending strength and torsional strength. Nail design, like that of any engineering structure, is always a compromise between including as many desirable properties as possible whilst trying to keep undesirable properties to a minimum. Nails are curved according to the bone involved and slotted along their length. The wall thickness of 1. Advantages of Nailing over Plating Intramedullary nail, biomechanically, offer several advantages over plate and screw fixation- Intramedullary nails are subjected to smaller bending loads than plates and are thus less vulnerable to fatigue failure. This is because the intramedullary cannal is closed to the central axis of the femur than the usual plate position on the external surface of the bone. Intramedullary nails act as load-sharing devices in fractures that have cortical contact of the major fragments. If the nail is not locked at both the proximal and distal ends, it will act as gliding splint and allow continued compression as the fractures is loaded. Stress shielding with resultant cortical osteopenia, commonly seen with plates and screws, is avoided with intramedullary devices. Refracture after implant removal is rare with the use of intramedullary devices Intramedullary implant do not usually require the extensile exposures required for plate application. These closed techniques result in low infection and high union rates, with a minimum of soft tissue scarring. Indications for Intramedullary Nailing Femur and tibia are bones where nails are most commonly and successfully used. The ideal indications for nailing are: Transverse and short oblique fractures of the tibial and femoral shafts. Comminuted fractures of tibia and femur, provided cross locking facilities are available. Pathological fractures Delayed or non-union of femur or tibia. Selected open fractures In children, as the nail may damage growth plates and should be avoided. This point where nail enters the bone is called entry point. In femur, this is piriformis fossa or tip of greater trochanter. Initially, a small hole is made using bone awl or drill and gradually enlarged with reamers to accommodate the nail diameter. Guide wire Insertion Guide wires are thin wires which are inserted in intramedullary canal after initial entry point is made with awl or drill. The guide wire is pushed into the medullary cavity through the entry hole made. Its position is ascertained by

C-arm image intensifier. Guide wires are passed through fracture fragments till the other end of the bone is reached. Reaming Using cannulated reamers, the intramedullary cavity is reamed to increase the size of cavity. Reamers could be manual or power reamers. The reaming is done over guide wire which guides the reamer and protects it from getting astray in the bone. Depending on the final reamer size allowed by bone, diameter of the nail is chosen which generally is smaller by one size. For example, if we can ream till size 11mm, the desired nail size would be 10mm in diameter. It is pertinent that the fracture fragments should be aligned while reaming is done. Fracture Reduction and Nail Insertion After length and diameter of the nail is determined, the nail is assembled with its inserting jig and inserted over the guide wire [in case of hollow nails, in solid nails guide wire needs to be removed before nail insertion. Locking Interlock nails have two holes at either end. A hole is drilled into the bone at right angle to the nail. It passes through the hole in the nail and then drills the opposite cortex. When a bolt is passed through this, it engages cortices on either side while engaging the nail hole too, thus locking nail and bone together. The introduction of pared holes which align at right angles to the long axis of a nail permits cross locking to give axial and rotational stability. Holes may be round, as they are usually at the distal end, to accommodate a screw or bolt. The holes are slightly bigger than the thread diameter of either bolt to allow smooth gliding through the nail. Following image illustrates the concept of dynamization very well. Mechanism of Dynamization when locking is done through dynamic slots. With loading, the screw allows play and bone fragments get approximated, Image Credit: AO Some proximal holes may instead be oval-shaped slots. This permits slight axial movement of the bone but still prevents rotation. This allows increased bone contact during loading and encourage callus formation and rapid healing. The process is called dynamization. Proximal locking is achieved by passing bolts through the aligned holes across the nail guided by a jig which attaches into the top of the nail. Locking in the distal screw holes of the nail is achieved under X-ray image intensification. Routine removal of screws later in fracture treatment to ensure dynamization is seldom necessary as the natural flexibility of the nail is sufficient to stimulate callus formation. Concept of Unreamed Nailing Some authors contend that reaming damages the interior blood supply of the bone. If a fracture is extensive and there is a lot of soft tissue damage, there is a risk that the outer blood supply will also be impaired. At best this will delay healing and at worst may lead to bone death. By using a smaller solid nail, reaming may be avoided. The concept of an undreamed nail as a way of stabilizing open fractures in causes where such severe damage to the blood supply is a distinct possibility, is now being actively explored. Instrumentation for Interlocked Intramedullary Nailing Nail and bolts constitute the implants. Nails of all sizes should be kept on the table for a particular case. Preoperative length could be measured by measuring the contralateral bone length. Each nail has its own instruments and these are generally not interchangeable. Major instruments are as below Guide wires A guide wire is used to provide an initial crossing of fracture site after the medullary canal of the fractured bone has been opened. It provides alignments and is essential to facilitate the passage of the reamers. There are two types of guide wire, each with a different diameter. One of the wires has blunt bulbous tip so that reamers cannot pass beyond the end of this guide wire. It is called beaded guide wire. By rotating it during the insertion process a degree of manipulative control may be achieved when trying to cross the fracture site. In the femur the thin guide wire is 3mm in diameter and the thicker one 4mm. Reamers There are two sorts of reamers with different cutting ends. The first reamer of 9mm diameter has a front cutting end to force an initial passage down the medullary canal of the bone. The rest of the reamers are side cutting and are used to widen the pilot hole. They come in o. Flexible shafts are constructed of wound coils of wire and are designed to rotate only in one direction. Under no circumstances should they be reversed or the wire will uncoiled. Cross bolt guides Also proximal cross bolts can be placed without the image intensifier using an outrigger jig. The distal holes positions can vary as the nails tends to twist slightly. The holes, therefore, will not always be in the expected plane. The nail comes in different outer diameter from 9mm to 13mm. The wall of the nail is The wall is 1. Universal Tibial Nail It is also called universal for the same reasons as described for femoral nail.

MEDULLARY NAILING pdf

3: Intramedullary Nailing - What You Need to Know

A metal rod forced into the medullary cavity of long, weight-bearing bones (e.g., femur, tibia), which allows ambulation within weeks rather than months. Intramedullary nails have a cloverleaf appearance on cross-section and are made of titanium, which has a lower rate of mechanical failure and.

A support can be placed under the thigh proximal to the knee, so there is no pressure in the popliteal fossa. For intramedullary nailing without reaming, the width of the medullary canal must be carefully measured in order to choose the correct nail diameter. Careful measurement of nail length is also needed. This is more difficult with solid nails as it is not possible to use a guide wire for direct measurement; a ruler is used instead. Choice of nail Intramedullary nails are tubular, solid, or cannulated. Reamed and unreamed nails are, in essence, similar implants which splint the bone from within; the difference lies in the technique of insertion. Intramedullary nails inserted with reaming are tubular and tend to be used with a large diameter. They have a long, proven record of success and are to be favored for closed fractures and nonunions. Intramedullary nails inserted without reaming are solid or cannulated and smaller in diameter 8â€”10 mm. They were originally introduced as a temporary and minimally invasive splint for open fractures, but proved to be useful for defi nitive fi xation and became popular even for the treatment of closed fractures. Locking with bolts or interlocking screws is mandatory for small-diameter nails in order to improve stability in a wide medullary canal. Locking is also recommended in all other situations unless the nail has achieved excellent endosteal contact above and below a stable type A midshaft fracture. The extent of reaming should be adjusted to ensure that the intramedullary nail will pass the isthmus easily and permit the insertion of a large enough nail to provide stability. In most cases, this means a nail with a diameter of 11â€”12 mm in acute fractures. In delayed unions or nonunions, even larger nails may be required for better stability. Most intramedullary nails, including the expert tibial nail, have the option of either static or dynamic locking. Both provide rotational stability, but dynamic locking allows impaction of the fracture while controlling axial alignment and rotation controlled dynamization. Dynamization is achieved by using a single proximal screw, placed in the proximal part of the oval locking hole in the nail. Unstable fracture patterns, such as long oblique fractures A2 or multifragmentary fractures B and C types should have static locking with two proximal screws. If one of the screws is placed in the dynamic slot, this leaves the option of secondary dynamization by removal of the static interlocking screw. However, in statically locked nails, dynamization is rarely required unless there is a gap wider than 2 mm that will probably delay fracture healing. The expert tibial nail allows the surgeon to compress the fracture by up to a maximum of 7 mm, and so it should be possible to prevent fracture gaps using this nail. In an atrophic or poorly vascularized healing response, other methods of stimulating fracture union are necessary, such as the exchange to a reamed, large diameter nail. In distal fractures with associated fibula fracture, it may be useful to fix the fi bula to aid reduction and increase stability. Surgical anatomy and approach The proximal nail entry point is not in line with the medullary canal in the sagittal plane, and so its exact position varies depending on the design and stiffness of the nail. The recommendations for different types of nails must be considered carefully. In the coronal plane, the entry point must remain extraarticular and be centered over the medullary canal, especially if there is a short proximal fragment. Eccentric nail insertion will result in a valgus or varus tilt of the proximal fragment. The correct entry point is usually situated at the medial edge of the patellar tendon. The entry point can be reached by retracting the patella tendon or splitting it. In some oblique fractures, a lateral parapatellar incision helps ensure a proper entry point and prevents fracture displacement during nail insertion. The entry point should be monitored by image intensifi er in both planes before commencing the procedure. The interlocking screws are usually inserted from the medial or anterior aspect. Reduction techniques The key to the initial reduction of tibial shaft fractures is the restoration of length. If the correct length is not obtained, an accurate reduction is almost impossible. Length can be obtained in a variety of ways, including: In fresh fractures, manual traction usually restores length. In delayed cases, the traction table or a distractor may be helpful. Once length has been obtained, axial and rotational reduction is achieved with percutaneously placed pointed reduction forceps, or with a wide, temporary

tourniquet at the fracture site, or indirectly using the nail as a joystick. In these cases, a nail that fills the medullary canal will align the bone fragments when it passes the fracture site. Reaming while the tourniquet is inflated should be avoided as it theoretically increases the risk of thermal necrosis of the cortex and overlying soft tissues. Good axial alignment prior to nail insertion is important when using a solid, unreamed nail. This relatively thin implant will not accomplish fracture reduction automatically, as can be the case with a large-diameter implant Fig 6. Poller screws may help to correct axial malalignment chapter 3. In delayed cases with some shortening, the distractor is most useful to gain length. It is also useful in fresh fractures when a surgical assistant is not available. The distractor is placed medially because this is safer, and the proximal pin is posterior to avoid the entry point of the nail. Since the distractor tends to cause a valgus position, the pins should be inserted in a slightly converging direction ie, place the fracture into varus , so that the axis is corrected when distraction occurs. The most difficult part is determining the correct rotation. Keys to this are: Reduction techniques The leg is splinted with the ankle in a neutral position for a day or two. This improves patient comfort and helps prevent equinus deformity. The leg is elevated for the first few days and the patient observed for signs of compartment syndrome. Active ankle and knee movements are started early. The timing of weight bearing depends on the fracture pattern and patient compliance. In axially stable fractures fixed with a large nail, immediate weight bearing as tolerated is allowed. In axially unstable fracture patterns, partial weight bearing with 20â€”25 kg is begun immediately, while full weight bearing should be reached within 8â€”12 weeks, according to the evolution of callus formation. Irritation of the patellar ligament can occur if the nail is protruding. Any incision on the anterior aspect of the knee can lead to pain and discomfort, especially when kneeling. Bending and breakage of interlocking screws is not uncommon, especially with the use of small intramedullary nails 8 mm diameter , and when time to union is delayed, ie, in open fractures. In many cases the bending or the breakage of the screw represents a sort of autodynamization. In fact, one of the features of closed intramedullary nailing is the high rate of union The use of unreamed nails did not improve these results. The average time to healing of closed fractures treated with an unreamed nail is longer than those treated by reamed nails. Exchange nailing In nonunion following tibial nailing, the technique of exchange nailing has become a standard procedure. Implant removal, reaming of the medullary cavity through the same approach, and insertion of a larger nail are the main steps of exchange nailing. This technique offers both a biological and a mechanical advantage: The reaming is an effective stimulus for osteogenesis and the use of a larger nail enhances the stability of the nonunion site.

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4: Intramedullary nailing of femoral and tibial shaft fractures

An intramedullary rod, also called an IM rod or nail, is a device used to treat broken bones of the long bones, such as the tibia or femur.

This article has been cited by other articles in PMC. Abstract Background The incidence of distal femur fracture in the elderly has been increasing recently, and commonly occurs with osteoporosis. Retrograde intramedullary nailing has been considered a good surgical option for distal femur fracture. The purpose of the present study was to present our surgical results with retrograde intramedullary nailing for distal femur fractures with osteoporosis. Methods Thirteen patients diagnosed with extra-articular distal femur fracture and osteoporosis and managed with retrograde intramedullary nailing were retrospectively reviewed. Cement augmentation was used in four patients, shape memory alloy was used in eight patients and both were used in one patient. All patients were followed up for more than 2 years. Radiologic alignments were scored and Tegner and the Lysholm activity score was used for a functional assessment. Results The average time to clinical union was 13 weeks range, 10 to 15 weeks. In 12 of our cases, the total alignment scores were excellent. The average functional score at postoperative 1 year was 2. Conclusions Retrograde intramedullary nailing is a good surgical option for distal femur fracture with osteoporosis. Cement augmentation and shape memory alloy can also be used for added mechanical stability. This surgical technique is very useful for distal femur fracture with osteoporosis as it promotes fracture healing and early rehabilitation. Distal femur fracture, Osteoporosis, Intramedullary nailing, Cement augmentation, Shape memory alloy Epidemiologic study in the United Kingdom found distal femur fracture accounts for 0. Since the incidence of distal femur fracture has been increasing recently and commonly occurs with osteoporosis, we should pay more attention to the management of distal femur fracture with osteoporosis. Compared to plate osteosynthesis, intramedullary fixation requires less extensive dissection and is better biomechanically. In a biomechanical study, the stiffness of the intramedullary nail was better than a dynamic condylar screw or a locking compression plate. However, in the treatment of osteoporotic distal femur fracture, it is very difficult to obtain sufficient implant anchorage. Cement augmentation has been used to stabilize intramedullary nailing. Shape memory alloy Bio-smart, Ulsan, Korea has also been used with retrograde intramedullary nailing in the management of periprosthetic supracondylar fractures. METHODS We retrospectively reviewed 20 patients who were admitted to our hospital between January and October for extra-articular distal femur fracture with osteoporosis and tracked for more than 2 years. Bone mineral density was evaluated with biplanar radiographs and dual-energy X-ray absorptiometry DEXA scanning in the hip and lumbar spine. In all of our cases, the lowest T-score was less than Cement augmentation or shape memory alloy Bio-smart was combined with retrograde intramedullary nailing in 13 patients to improve mechanical stability. We included these 13 patients in this study Table 1. Their mean age was 79 years range, 68 to 90 years and all were females. All operations were performed by one orthopedic surgeon. The patient was placed in the supine position on a radiolucent operating table. A midline incision and medial parapatellar approach were used. A guide wire was inserted under C-arm fluoroscopy and the medullary cavity was reamed. When we inserted distal interlocking screws, we checked the bone stock quality in the distal fragment. We added cement augmentation or shape memory alloy, if rigid fixations between distal fragment and distal interlocking screws were not achieved due to configuration and location of the fracture or severe comminution. If the fracture line was located above the flare of the femoral condyle and the configuration of the fracture was spiral or long oblique, we used shape memory alloy Fig. Even in the A3 type fracture, if the configuration of major fragments was spiral or long oblique, we applied shape memory alloy. When we applied shape memory alloy, we paid close attention to preserve periosteum and applied shape memory alloy outside of the periosteum. To improve mechanical stability of the bone implant construct and to prevent pulling out of the interlocking screw, we used cement augmentation Figs. In the A3 type fracture with anterior cortical comminution, we also used cement augmentation Fig. From the 1st postoperative day, joint exercise using a continuous passive motion machine was started and weight bearing was allowed at the 6th postoperative week.

MEDULLARY NAILING pdf

5: Intramedullary rod - Wikipedia

Intramedullary nailing is surgery to repair a broken bone and keep it stable. The most common bones fixed by this procedure are the thigh, shin, hip, and upper arm. A permanent nail or rod is placed into the center of the bone.

What do I need to know about intramedullary nailing? Intramedullary nailing is surgery to repair a broken bone and keep it stable. The most common bones fixed by this procedure are the thigh, shin, hip, and upper arm. A permanent nail or rod is placed into the center of the bone. It will help you be able to put weight on the bone. How do I prepare for surgery? Your healthcare provider will talk to you about how to prepare for surgery. Do not eat or drink anything after midnight on the day of your surgery. He will tell you what medicines to take or not take on the day of your surgery. You will be given an antibiotic through your IV to help prevent a bacterial infection. What will happen during surgery? You may be given general anesthesia to keep you asleep and free from pain during surgery. You may get medicine to block pain in nerves that are near the surgery site. Numbing medicine may be injected into your spine if you are having a leg bone repaired. You will be awake if you have a spinal injection, but you will not feel pain. Surgery is usually done through small incisions made in the skin. Your surgeon will thread a guidewire into the center of the bone. He may need to use a device to make the bone hollow. He will then line up the broken ends of the bone. The nail is then inserted into the hollow part of bone to keep the bones lined up. Locking screws are placed on both ends to keep the nail in place. Stitches or staples may be used to close the incisions. What will happen after surgery? Your legs may be numb for 6 to 12 hours after surgery if you had a spinal injection. You may have swelling and pain in your leg from surgery. This is normal and should get better within a few days. You may be given medicines to reduce pain and swelling. You will need to walk around on the day of surgery, or the day after. This will help prevent blood clots. It also puts weight on the bone. Weightbearing is important for strengthening the bone. You may need to wait until the bone heals before you put your full weight on the bone. Healthcare providers may have you use crutches or another support device. Deep breathing exercises help open your airway and decrease your risk for a lung infection. Take a deep breath and hold it for as long as you can. Let the air out and then cough strongly. You may be given an incentive spirometer to help you take deep breaths. Put the plastic piece in your mouth and take a slow, deep breath, then let the air out and cough. Do the exercises 10 times every hour. A pressure stocking will be used to increase blood flow and prevent blood clots. This is a long, tight stocking. It puts pressure on your legs and moves blood out of lower leg veins. You may also be given blood thinning medicine to help prevent clots. A physical therapist may teach you exercises to help your leg heal. The exercises can also help strengthen muscles and keep your joints flexible. What are the risks of intramedullary nailing? You may have an allergic reaction to the anesthesia or to the antibiotics. You may develop compartment syndrome. This is a condition that develops when too much pressure builds within muscles. Blood cannot flow to muscles and tissues. This can cause severe muscle and nerve damage that can become permanent. Your fracture may heal in an abnormal position. The ends of the fracture may not join correctly. This can prevent healing. The nail or rod used may bend or fail. You may need surgery again if this happens. You may also have damage to nerves or blood vessels. The damage can cause temporary or permanent numbness. You may also feel irritation in the area where screws were placed. Care Agreement You have the right to help plan your care. Learn about your health condition and how it may be treated. Discuss treatment options with your healthcare providers to decide what care you want to receive. You always have the right to refuse treatment. The above information is an educational aid only. It is not intended as medical advice for individual conditions or treatments. Talk to your doctor, nurse or pharmacist before following any medical regimen to see if it is safe and effective for you.

6: Intramedullary Nailing of Fractures | Bone and Spine

Medical definition of medullary nailing: the fixing of a fractured long bone by inserting a steel nail into the marrow cavity of the bone. the fixing of a fractured long bone by inserting a steel nail into the marrow cavity of the bone.

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7: Medullary Nailing Medical Definition | Merriam-Webster Medical Dictionary

This 3D medical animation features a dramatic surgical overview during the operative placement of an intramedullary nail into the right leg to secure a comminuted femur fracture. Item #ANS

8: Retrograde Intramedullary Nailing for Distal Femur Fracture with Osteoporosis

Implant removal, reaming of the medullary cavity through the same approach, and insertion of a larger nail are the main steps of exchange nailing. This technique offers both a biological and a mechanical advantage: The reaming is an effective stimulus for osteogenesis and the use of a larger nail enhances the stability of the nonunion site.

9: Understanding Your Intramedullary Nail

In some cases however, particularly fractures of the long bones, today's best orthopaedic treatment includes securing the fracture internally with a metal intramedullary nail implanted by surgical procedure.

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