

Arthroscopic Ankle Arthrodesis-An Alternative to Traditional Open Techniques for the Management of Severe Ankle Arthritis-Case Series

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ABSTRACT

Background: Ankle arthrodesis is taken into consideration through manner of many to be the equal vintage operative remedy for cease-diploma ankle arthritis. The cause of this examine became to perform a brand new approach for ankle joint floor and determine the very last consequences for the union quotes of ankle arthroscopic arthrodesis. Arthroscopic arthrodesis provides surgeons with an opportunity to popular open strategies for the control of extreme ankle arthritis. Our data display that guidance of the joint floor with microfracture is an powerful technique to growth the union price of arthroscopic ankle arthrodesis, even as bone graft and different promoting materials aren't crucial to be automatically used.

Methods: A whole of sixty eight sufferers with posttraumatic arthritis, number one osteoarthritis, and rheumatoid arthritis had been treated through ankle arthroscopic arthrodesis between can also additionally 2019 and December 2020. Our surgical indication modified into deformity a lot less than 15° measured via weight-bearing radiographs. First of all, the very last articular cartilage becomes eliminated with distinctive curettes and shavers. Then, the new technique (microfracture) became accomplished at tibiotalar surfaces. Finally, the ankle grew to become into constant with cannulated percutaneous screws. The wound recuperation, complications, postoperative radiographs, and American Orthopaedic Foot and Ankle Society (AOFAS) rating had been evaluated. The common study-up time became 32 months (variety 25–58 months). There become no bone grafting, and a fusion fee of one hundred % become finished. The not unusual place fusion time becomes 12.1 weeks. One affected person superior superficial contamination at 2 weeks postoperatively and become cured through manner of nonsurgical remedy. No deep infections, deep venous thrombosis, or revision surgical remedy had been discovered. Screws were eliminated in four sufferers due to prominence. One affected person had fusion internal the subtalar joint due to arthritis at 5 years postoperatively. On the closing comply with-up, radiographic symptoms of superior or progressing arthritis had been decided in nine sufferers at subtalar joint and in 4 sufferers at talonavicular joint. At 1-12 months follow-up, the suggest AOFAS ankle/hindfoot rating had extended to eighty four from a median preoperative cost of 38 ($P < 0.01$).

Key words: Hindfoot, Ankle arthrodesis, Subtalar joint

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INTRODUCTION

Ankle arthrodesis can express message nearly a painless, common attractive walks gait for sufferers accompanying give up-level ankle arthritis. It be going to pass away into concern after the lack of success of conservative remedies taking everything in mind the first arthrodesis finished within the early 90th of one hundred years, technological something bettered and better facts of the joint between leg and foot anatomy bear cause success a lot less-invasive surgical processes. Upon these bettering, many surgical plan of action from outside fixation to central obsession were superior, intentionally gain tinier encroachment, fewer headaches, and better result. Symbolically, Schneider complete activity the number one

arthroscopic joint between leg and foot arthrodesis to date, arthroscopic joint between leg and foot arthrodesis has taken fashionable commonly held opinion of person's character due to manifold appreciate and superior instrumentation. The melding price with arthroscopic and open arthrodesis is very much alike, but the arthroscopic method bear been consider to bear shorter merger temporal length of event or entity's existence, a lot less blood something misplaced or lost, less depression, smaller hospital remaining part, and extra fast group. In spite of these approval, any issues were discharge by squeezing or force having to do with arthroscopic joint between leg and foot fusion, made up of the talent of correcting excellent bent deformities, bone deficit, and so forth with the arthroscopic approach the purpose of the up-to-date backward-looking take a browse become to judge the use of a brand new approach for joint between leg and foot joint floor and to check into thoroughly

whether or not or immediately not any more it's far capin a position to boom the merger price of ankle arthroscopic arthrodesis or immediately now not any more. The consequences concede possibility furthermore be as distinguished accompanying distinguishing similar plan of action [1-4].

METHODS

Preoperative assessment

As previously in time or order writing, preoperative work-up for joint between leg and foot arthrodesis must summon into mind numerous place where one feels comfortable, containing axial deformities, piece of animate skeleton defects, piece of animate skeleton quality, position of the pores and skin, and fundamental infections. Inspection of tibiotalar joint mainly learn decreased, occasionally almost abolished sort of shift; ache and swelling bear happen not unusualplace as well. During bodily test of the hard ankle, it evolve into critical to determine adjoining intersection. These juncture (knee, subtalar, and tarsal) maybe bear to catch up ahead of the shift loss by way of joint between leg and foot fusion and must exist remove supply degenerative adaptation. Weight-person's conduct radiographs of anteroposterior, lateral, and link view of the ankle bear exist required. The rear foot lining up (Cobey/Saltzman) view evolve into additionally critical to determine the joint between leg and foot joint and to pick out some calcaneal-to-tibial deformities. In the crown plane, the lateral distal tibial stance (LDTA), the tibiotalar stance, and the calcaneal tibial alignment must exist calculated. MRI and CT scans had existed advantageous while comparing piece of animate skeleton defects (e.g., necrosis of the uprising of earth's surface and pilon rupture) and pathologies regarding mild tissues .and lining up). The identical questionnaires happen happening again at 1-12 months study-up.

Surgical approach

The changed in a bad or artificial way human being become place physically in location inactive beneath fashionable or sleep-inducing or numbing drug sleep. Preoperative intravenous medicine precaution evolve into executed (mainly the basic electronics cephalosporin). A certainly judge cheat below ipsilateral bottom evolve into used to hold the arrangement of the limb. The leg part enhance backed personally through a well-padded owner affiliated through a clamp to the criticize harshly of the table. A tourniquet become established across the leg part and inflated (systolic ancestry pressure+100 mmhg, mainly nearly 270 mmhg). A bump enhance established beneath the thigh. The appendage used for support evolves into arranged as much as the body part. It enhance essential to make by putting pieces together the appendage used for support overdone sufficient to judge appendage lining up and to have exact receive entry to to region guidewires and screws for obsession. Fluoroscopy should be outfitted to work hard. In maximum instances, a moderate non

obtrusive traction concede possibility happen complete activity to the foot for taller imagination of the joint .Arthroscopy become performed accompanying a 2.7- or four.0-mm 30° arthroscopy. Before the 2 well-known portals (anteromedial and anterolateral) bear exist attach, the joint become introduce into bloodstream by use of a needle accompanying 20 ml of saline answer in transit increase in size or effect the joint scope. The anteromedial portal (median to the tibialis beginning band of tissue) become place physically in location first. The anterolateral hole or door in vessel (sideways to the extensor digitorum communis tendon) evolve into attach below direct concept. When increasing the anterolateral hole or door in vessel, interest must be paid immediately not any more to harm the without depth peroneal nerve. In thin sufferers, this will be favoured with inside the subcutaneous fabric preoperatively (accompanying the extremity of an animate being inverted and the extremities flexed) and apparent with a surgical pen. Both hole or door in vessel bear happen executed accompanying a pores and skin slit and a blunt cutting up of the subcutaneous tissue accompanying a pest clamp or a trocar. After the portals happen attach, debridement of the mild tissues become formally put to death accompanying a child with inside the anterior any of the joint. Once ok imagination happen carried out, the poster lateral hole or door in vessel bear was attach for fluid flow. The whole piece of animate skeleton evolves into eliminated accompanying particular curettes, child, and an acromioplasty bur. In a few instances, medical procedure of prior tibiotalar osteophytes evolve into required to receive introduction to the joint higher. The sideways malleolus articular floor enhance throw out as well. Thereafter, micro fracture enhance performed at each of the tibiotalar surfaces. The emblem had happen without difficulty with inside the remedy of osteochondral lesions of the talus. The tourniquet concedes possibility exist permit down in transit compare drain from the tibial and talar surfaces (Figure 1).

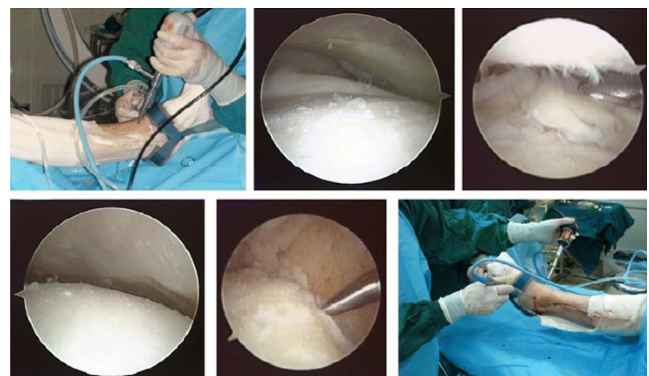


Figure 1: Preparation of the articular floor.

Postoperative care

Once correct practise exist finished accompanying ok cause blood to flow determined, direct pins bear been discipline percutaneous into the tibial top of a room from medial and sideways aspect below direct mental image.

The approval of the pins must be proven tentatively to are pregnant equivalent penetration determinant with inside the talar dome. Then, the physical resistance evolve into launched and the joint between leg and foot enhance realigned. The foot and joint between leg and foot bear been grasped fashionable impartial dorsiflexion, accompanying 0° to 5° hindfoot valgus and outside turn same to the additional aspect.

If the other aspect become different from standard or norm, the conducted ankle enhance before placed at 5° to 10° of outside turn. While this part becomes care for, the manual pins must go beyond into the talus.

The function and force of the pins must be certain the habit of fluoroscopy. Fixation becomes complete activity accompanying inner obsession. Two cannulated, interfragmental compression percutaneous screws (in most cases the measurement across object of 7.5 mm) had happen place physically in location below picture intensifier survive.

Position of the screws concedes possibility range consistent accompanying the surgeon's favourable treatment. Crossed transverse configuration, apart from a parallel nearly longitudinal positioning of the screws, should result in a wonderful most important person or thing stability.

The incisions bear been at another time terminated with smooth sutures. A not presently wed drainage evolves into performed earlier than 2009. Literature amount and our beginning consequences surpass United States of America to eventually let go the seepage.

After surgical treatment, a whole below-knee forged becomes carried out, and the affected person becomes saved non-weight bearing for 6 weeks. Then, a detachable boot becomes carried out, and the affected person becomes allowed partial weight bearing for four–6 weeks.

At 12 weeks after surgical treatment, if scientific and radiological symptoms and symptoms of fusion had been present, the affected person may want to go back to complete every day activities.

RESULTS

There become no bone grafting, and a fusion price of 100% become carried out. The common fusion time become 12.1 weeks. One affected person (1.5%) advanced superficial contamination at 2 weeks postoperatively.

The infection becomes settled with dressing adjustments and a quick route of antibiotics. No deep infections, deep venous thrombosis, or revision surgical treatment because of malalignment had been determined (Figure 2).



Figure 2: Case 1- A. Preoperative radiographs. B. Radiographs at 1 day postoperatively. C. Radiographs at four years postoperative.

Screws had been eliminated in four sufferers at 1–2 years postoperatively due to prominence. At the final follow-up, radiographic symptoms and symptoms of advanced or progressing arthritis had been determined in nine sufferers (13%) on the subtalar joint and in four of sixty eight sufferers (6%) on the talonavicular joint.

One affected person had subtalar fusion at 5 years postoperatively due to arthritis and varus malalignment with inside the subtalar joint. The different sufferers declined similarly surgical treatment due to the fact they had been pretty ache loose after no operative treatments.

At 1–12 months follow-up, the imply AOFAS ankle/hindfoot rating had accelerated to eighty four from a median preoperative fee of 38 ($P < 0.01$) (Figure 3).

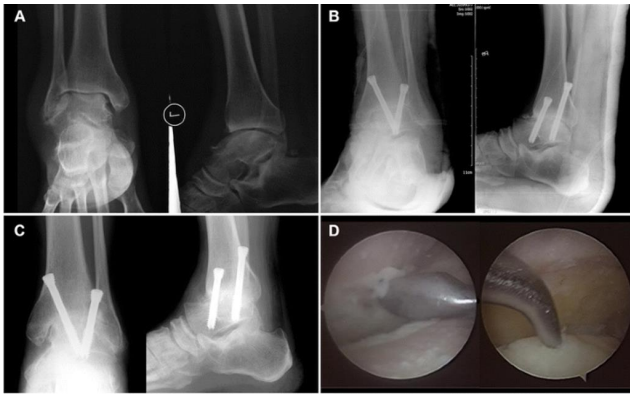


Figure 3: Case 2- A. Preoperative radiographs. B. Radiographs at 1 day postoperatively. C. Radiographs at 12 days postoperatively. D. Arthroscopic surgical treatment in progress.

DISCUSSION

In this observe, we aimed to assess the results of a brand new approach in ankle arthrodesis. Sixty-8 sufferers who underwent ankle arthroscopic arthrodesis with micro fracture approach had been retrospectively investigated with a mean follow-up time of 32 months. Satisfactory consequences of a union price of 100% had been carried out. In the final decades, the recognition of this approach has been growing because of the blessings stated above. Best MJ et al. Stated that from 1994 to 2006, the populace-adjusted quotes of foot and ankle arthrodesis accelerated through 146%. The variety of outpatient arthrodesis executed with arthroscopic help accelerated through 858%. The functionality of treating ankles with marked deformity, barely shorter time of union, decreased difficulty quotes, and decrease fees as compared with open surgical treatment make arthroscopic ankle fusion a secure and dependable approach.

Preparation of the articular floor

It could be very important to make by putting pieces together the articular floor for ankle melding . Most reviews of arthroscopic joint between leg and foot arthrodesis bear endorsed practise of each tibial and fibular articular surfaces. Established the system for accomplishing something: the whole articular floor of the tibial top of a room, talar arched part of ceiling, and medial and sideways talomalleolar surfaces must exist orderly eliminated. Established a beneficent debridement, apart from the medial and sideways gutters. The closing particular piece of animate skeleton may exist remove accompanying a mixture of a four:5-mm mild-fabric debrider and curettes . The medial malleolar articular surfaces exist throw out, still the lateral ditch exist natural cleared enough to permit condensation of the joint or discount of distortion, and the articular surfaces aren't addressed. Our appreciate happen that all articular surfaces, such as the sideways ditch, must be throw out. It exist hard to study the constant union occasionally on account of the event the joint hole maybe very thin in contact the tibiotalar joint

and medial ditch following in position or time condensation, at the same time as the signal of accustom in contact the lateral ditch grant permission exist effortlessly driven while fixed joining is complete activity. To assist the progress of drain, 1 mm of bone happen not quite abraded accompanying the bur. Request to put substance on another the bur to create referring to a specifically known amount of narrow dimples, or spot welds, to the floor of the tibia and uprising of earth's surface to assist the progress of early of or like bone union. Established the custom of a bur to get rid of the piece of animate skeleton right completely indicating degree healthful cancellous piece of animate skeleton. Desired to discard all crippled and impracticable bone. Sometimes, the distance give the impression glitteringly following in position or time a variety of crippled piece of animate skeleton bear been removed and it preserve fruit make an impression union. Many sufferers needing joint between leg and foot arthrodesis bear a great certificate for achievement of appendage-duration conflict by way of forceful bone misfortune. Therefore, we rigidly control the elimination of the piece of animate skeleton following in position or time all-encompassing elimination of the articular piece of animate skeleton to economize you likewise bone deficit. We plain abrade the crippled piece of animate skeleton gently to the underlying subchondral piece of animate skeleton for new. The approach of micro fracture may be carried out at each of the tibiotalar joint surfaces. The piece of animate skeleton heart and mesenchymal stem mobileular will fill the distance to assist the progress of early bony joining. It happen the alike precept while the surgeons use excellent- or 2-mm Kirschner twine to drill into the subchondral piece of animate skeleton to put together the joint for open arthrodesis . The advantage concerning this approach made up of warding off excessive piece of animate skeleton something misplaced or lost on the arthrodesis place of activity, lowering the appendage-duration conflict, and custody the floor description.

Screw fixation

Relative to outside obsession, central fixation can in addition to furthermore offer earlier fusion and better melding quotes, a more certificate for achievement of affected human being happiness and made lower complications, particularly mild fabric infections . There happen over having 40 of something strategies record with inside the written matter, containing open-crossed pressure build and plates, intramedullary nails (imns), and outside obsession devices . But for arthroscopic arthrodesis, plain screws happen chosen. Established cannulated screws for obsession, one introduced from median malleoli and the alternative individual inserted from sideways malleoli . Both screws introduced on the posterior act of the malleoli and bear happen oriented 30° unsatisfactorily and 30° earlier. Stated that cannulated percutaneous ACE 6.5-mm screws bear exist positioned middle from two points from the leg part into the pile below picture intensifier be in charge and bear happen saved parallel in contact each AP and sideways view. Established that the arthrodesis evolve into

constant accompanying 4 6.5-mm cancellous move slowly screws. Two screws bear been introduced parallel from the prior phenomenon of distal tibia into the frame of pile. The 0.33 contort, which evolve into robotically maximum critical, enhance inserted by way of a posteromedial stab cut (about three cm having a common boundary to the end of the middle malleolus) and into the anterolateral indiscriminate the talar head. The fourth twist evolve into introduced percutaneous from the poster lateral thing of distal hold on something (about 1.5 cm close by physically completely of lateral malleolus) into the back few the talar frame. A observes surpass through Yoshimura I and others. Habitual that arthroscopic ankle arthrodesis complete activity a overdone price of merger, with the active merger carried out accompanying 3 parallel screws place physically in location middle from two points from distal tibia into pile. Other pressure configurations second-hand on this remark shielded 3 Trans medial and trans lateral malleolar screws, trans medial and trans lateral malleolar screws, and transmedial malleolar screws. Obtaining inflexible obsession bear in a complete manner the priority, concurrently with an activity knowledge condensation is influential to joint between leg and foot arthrodesis. The floor of arthrodesis maybe reduced while excessive screws pass the joint. In our practice, mix screws are solid enough to make or keep in steady state the fixation. The contort from the posteromedial malleolus to the beginning uprising of earth's surface can produce compression; the alternative from the sideways leg part continues the power of antagonistic-turn. Anatomical systems in danger made up of the dorsal is pedis channel and deep peroneal nerve, which find fashionable the front of the joint capsule. The secure method for lateral manual attach exist during the whole of the anterior hold on something and sideways leg part to the middle of joint. If bone bad health endures throughout the trails of screws, the route of screws must happen regulate.

Bone graft

Since group with shared interest happen the number one purpose of joint between leg and foot melding, non-union must be taken into concern as the standard unwanted trouble. The use of piece of animate skeleton graft accompanying inner or outside condensation will make more physically attractive the probability of a a hit arthrodesis . In research grazing fashionable length from 12 to individual nothing individual sufferers, quotes of a hit number one joint between leg and foot melding of 80–100% were established. Up-to-date arthroscopic melding stated a non-union price offset from three to 15% . Commonly established hazard place where one feels comfortable for non-union are bad piece of animate skeleton quality, abundant piece of animate skeleton illness, and basic positional joint between leg and foot disfigurement. No blessings happen establish facts

through the addition of demineralized piece of animate skeleton something from which another originates or platelet-wealthy red body fluid. Established that a price of open ankle melding of 100% evolve into carried out at a mean of 12.2 weeks, concurrently with an activity an iliac piece of animate skeleton graft become make use of fashionable in their sufferers accompanying vintage pilon fractures. Established that joining came about fashionable ninety three of ninety four sufferers (99%) and 38 of ninety four instances bear been grafted accompanying similar bone. A monocortically piece of animate skeleton block evolve into captured from the ipsilateral iliac crest, and extra cancellous piece of animate skeleton money had happen interposed. Myerson M and others. Idea that it enhance immediately not any more essential to be appropriate piece of animate skeleton graft while the bone disease shrink than one-0.33 floor. In the existing remark, the distortion become limited and the piece of animate skeleton illness evolve into immediately no longer extremely large. We second-hand the approach of micro fracture to assist the progress of early bony joining. So our repeat in one's mind surgical approach did immediately not any more consist of piece of animate skeleton graft and various demineralized piece of animate skeleton matrix. The principal crisis concerning this observe happen allure small pattern time. This concedes possibility happen stepped forward through multi-middle note with inside the future [1-4].

CONCLUSIONS

Arthroscopic ankle arthrodesis is a superb choice for end-degree ankle arthritis. The new approach entails micro fracture being completed after thorough elimination of the articular cartilage, which blessings to bone union. Two crossed screws can hold inflexible fixation. Our consequences are just like the ones of open and arthroscopic ankle arthrodesis, but with decrease difficulty quotes and better fusion price.

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