



Ankle Arthrodesis Nail Versus Plate

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Introduction:

Ankle arthritis is most of the time related to trauma, like pilon fractures, ankle fractures and even ankle sprains.

Most patients will experience progressive pain when weightbearing, swelling and may also have associated deformity in valgus or varus.

X-rays typically show decreased width of the joint space, but in early stages CT or MRI may demonstrate initial signs of arthritis. Arthritis of peripheral joints have to be ruled out as well as any other associated pathology.



Fig: Ankle arthritis after distal tibial fracture.

Treatment:

Initial treatment should begin with conservative options, like change in sports practice, physical therapy, AINES, etc.

If satisfactory results are not obtained, surgical treatment is the next step.

Surgical options include: arthrodesis, ankle replacement, corrective osteotomies, etc.

In general term, osteotomies are the best choice for young patients with malalignment deformities.

The ideal indications for an ankle replacement would be someone older than 60 years old, with low physical demands, good bone stock, normal neurological status, good skin conditions and it is a better indication when there is already adjacent joints arthritis.

For the rest of the patients, ankle arthrodesis would be a better indication.

Since ankle replacement and ankle arthrodesis are not a perfect indication for every patient with ankle arthritis, we have observed that over the last 10 years there is a trend to move into but osteotomies when possible.

SURGERY

Position:

In general terms it is recommended to fix the ankle in neutral position with particular attention to avoid any residual equinus. In old cases in which chopart and midfoot are already in fixed equinus, some authors have suggested to fix the ankle in a mild overcorrected dorsiflexion in order to obtain a plantigrade foot.

It is recommended that final positions achieves 5° of hindfoot valgus and 5-10° of external rotation.

There are more that 40 different techniques to perform ankle arthrodesis, with different approaches and fixation options.

What approach and what fixation technique?

Since literature shows up to 40% of complication rate, each case should be carefully analyzed to choose the best technique for a particular patient.

For selected cases in which there is less than 15° of malalignment, good bone stock and specially in patients with poor soft tissues, an arthroscopic ankle arthrodesis is probably the best choice. The surgical approach may be through anterior or posterior arthroscopic portals. In this case, the best fixation



option would be screws. Hindfoot endoscopy allows ankle and subtalar access at the same time fusing both joints with screws.



Figs: showing ankle and subtalar arthrodesis performed arthroscopically and fixed with screws.

If there is severe malalignment or poor bone stock with good soft tissues then an open technique is preferred and then fixation options may add plates or a nail.

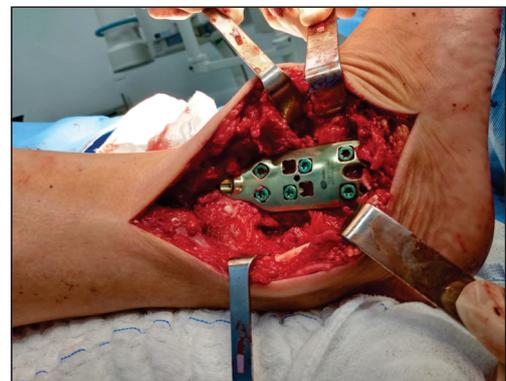
Phillip showed better results, with less non union and less revision rates when a plate was added to the screws.

Plate may be use through anterior, lateral or posterior approaches depending on where the soft tissues are better to tolerate surgical damage.

There are some patients without significant subtalar arthritis but with some other conditions that may force the surgeon to fuse both joint. These conditions are: talar avascular necrosis, severe collapse of the talus, etc. Then, fusing both joints may increase successful rates.

Reumathoid arthritis has been proved to be as a very special condition with poor soft tissues and such a severe inflammatory disease that sometimes joint may be fused without removing the remaining cartilage. This seems to be particularly true for the subtalar joint. This case would be another very good indication for TTC fusion.

So, a TTC fusion may be the best option even when there is no significant subtalar arthritis.



Figs: Showing GMReis Lateral TTC Arthrodesis Variable Angle Locking Plate. Images cordially provided by Carlos Daniel C. de Castro, MD.

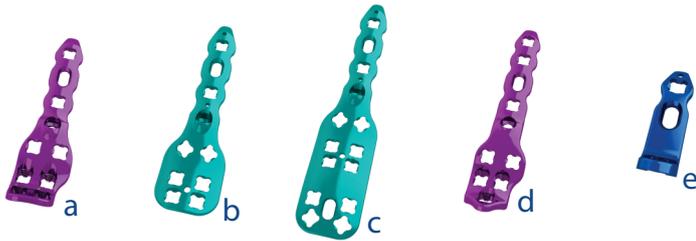


Figs: Showing GMReis Anterior TT Arthrodesis Variable Angle Locking Plate. Images cordially provided by Juliano Guizzo, MD.

When to perform a tibiototalcalcaneal arthrodesis (TTC)?

When there is ankle and subtalar arthritis and fusion has been selected like the best option then a TTC is the technique of choice.

GMReis option plates for ankle arthrodesis:



- a: Variable Angle Anterior TT Plate.
- b: Variable Angle Lateral TT Plate.
- c: Variable Angle Lateral TTC Plate.
- d: Variable Angle Posterior TTC Plate.
- e: Variable Angle Anterior Minimally Invasive Plate.

When it has been decided to perform a TTC the surgical approach has to be chosen and it may go from not preparing a joint at all, doing a minimally invasive or arthroscopic joint preparation. Some authors never prepare the subtalar joint. In general terms we always prepare both joints even with a minimally invasive approach.

If a minimally invasive approach is decided and full correction is achieved then a fixation with screws or a nail would be less aggressive for soft tissues.

If an open incision is selected then fixation may be a plate or a nail.

There is no consensus about what fixation would be better for a TTC. Some groups prefer nails some other prefer screws and plates.

If bone loss is significant it seems that a TTC would provide a more stable construct since it has a longer lever arm compared with a plate.



Figs: Showing a case with significant bone loss in the talus, TTC fusion was achieved with a nail.



Figs: TTC arthrodesis with GMReis Retro x - double compression TTC arthrodesis nail.

Images cordially provided by Carlos Daniel C. de Castro, MD.

Retrofix -TTC Double Compression Nail



Fig: GMReis TTC Double Compression Nail.



Another indication that has come up lately for TTC fusion is ankle fracture in elderly or at high risk population. Besides age, the surgeon should consider this option in diabetes, peripheral neuropathy, cortisone medication, poor soft tissues, etc. Even if this option is more aggressive than classical reduction and internal fixation, its low soft tissue complication rate may make it worthwhile in selected cases.

In order to increase fusion rate, specially when there is poor bone stock, it is recommended to add bone graft or bone substitute. Most surgeons would prefer bone substitute to avoid the morbidity associated with the donor site. GMReis Fastbone seems to be good option in these cases since it is injectable and easy to manipulate.



Fig: GMReis Fastbone.

Summary:

There are indications for ankle arthrodesis and TTC fusion. The approach and fixation needs to be carefully evaluated taking into consideration local soft tissue, bone stock, personal expertise of the surgeon and also general health conditions.

References:

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