Early Weightbearing in the Lapidus Utilizing Locking Plates with a Built in Compression Screw Slot: A Retrospective Review

Pittsburgh, Pa
www.theorthopedicgroup.com
Early Weightbearing in the Lapidus Utilizing Locking Plates with a Built in Compression Screw Slot: A Retrospective Review

Mark H. Hofbauer, DPM, FACFAS

My disclosure is in the Final AOFAS Program Book.
I have a potential conflict with this presentation as I am on Stryker’s speaker’s bureau.
Traditionally, arthrodesis procedures of the foot and ankle have required prolonged periods of non-weightbearing for osseous union.

Advances in internal fixation, specifically locking plates, have created more stability and rigidity than previously available allowing for earlier weightbearing.

The purpose of this study is to evaluate the use of a low profile locking plate with a built-in compression screw slot combined with early weightbearing for the Lapidus bunionectomy.
Materials & Methods

- A retrospective chart and radiographic review was performed on twenty patients who underwent twenty Lapidus bunionectomies utilizing a low profile titanium locking plate with built-in compression screw slot.
- We assessed time to radiographic union, non-union rates and complications rates.
- Post operatively patients were placed in a non weight-bearing posterior splint and given crutches.
- At two weeks, patients were permitted protective weight bearing with crutches in a CAM boot and began a course of physical therapy three times a week for four weeks.
- Gradual transition was made to full weight bearing in a CAM boot at four weeks with a return to normal shoe gear at six weeks.
Surgical Technique

- Following resection of the medial eminence on the first metatarsal head and soft tissue balancing, the opposing articular surfaces of the metatarsocuneiform joint (MCJ) were resected and fenestrated with a 0.045 k-wire
- To allow for correction of the increased intermetatarsal angle, the lateral base of the first metatarsal was resected in all patients
- Manual manipulation and temporary fixation was then utilized to maintain the corrected position, and a 1.3mm titanium locking plate was placed dorsally over the MCJ
- Distally on the first metatarsal, 3.5mm locking screws were placed into the plate
- Next, a 3.5mm non-locking compression screw was placed directed towards the navicular tuberosity, via a pre-designed ramp
- Following this, 3.5mm locking screws were then placed proximally to secure the plate
Twenty patients were evaluated, seventeen men and three women. Mean follow-up time was 25 months (range 13-40 months; SD 4.4). Mean age was 55.1 years (range 15-76; SD 10.2). Mean time to radiographic union, as defined by bony trabeculation noted on at least two radiographic views, was 6.8 ± 1 weeks (SD 5.2). Three asymptomatic non-unions were noted (5.1%). No patients required hardware removal or revisional surgery. Overall, a 94.8% fusion rate was noted.
Discussion

- Various ways to fixate the Lapidus bunionectomy have been described in the literature, including cross screw construct, locking plates and locking plate and screw combinations.
- A recent trend towards the use of locking plates, with or without a compression screw, has gained popularity.
- This trend has lent itself to earlier weight bearing times post operatively.
- Our goal in this study was to evaluate early weight bearing times following a Lapidus bunionectomy and its effects on radiographic union using a low profile locking plate with a built-in compression screw slot.
The reported fusion rates vary depending on which fixation constructs are utilized

- Crossed screw techniques have a reported non-union rate of 3.3% to 12%
- Menke et al described a 90.5% fusion rate when using a locking H-Plate with a interfragmental lag screw for the Lapidus bunionectomy
- In a comparison of fixation techniques DeVries et al reported both earlier weight bearing times and higher union rates with a locking plate, with or without a compression screw, when compared to the traditional crossed screw constructs

- Our results using a low profile titanium locking plate with compression screw show 94.8% union rate, which is comparable to other reported rates using similar fixation techniques
- Our reported non-union rate of 5.1% is comparable to previously reported values
Conclusion

- Prolonged immobilization times in foot and ankle surgery have often been associated with complications during the post-operative period.
- In an effort to avoid these complications, the authors introduce a low profile locking plate with built-in compression screw for the Lapidus bunionectomy.
- This has allowed for earlier weight bearing times postoperatively without affecting our union rates.
- To our knowledge, this is the first reported use of a locking plate with a built-in compression screw slot specifically designed for use with the Lapidus bunionectomy.
- This combination not only provides predictably high union rates but also allows for earlier protective weight bearing.
References