Introduction & Literature Review

Hallux abductovalgus (HAV) or “Bunion” is one of the most common problems that patients come to podiatrists in order to take care of. Many patients opt for the surgical option of the “bunionectomy”, but there are a myriad of procedures a surgeon can choose in order to correct deformity. Coughlin describes causes of HAV that include hypermobility, heredity, growth, pes planus, and intrinsic intermetatarsal angle abnormalities (1). When selecting a procedure to perform a bunionectomy, the intermetatarsal angle is usually the primary variable. Coughlin and Mann suggest different procedures for mild, moderate, and severe angle deformities respectively (2). Most bunion procedures require open exposure to the joint (and require internal fixation) which may lead to complications in painful hardware or painful scarring. However, as our surgical world evolves, more emphasis has been put on efficiency while maximizing patient outcomes.

There are many advantages of Minimally Invasive Surgery (MIS) with percutaneous fixation for a variety of foot and ankle procedures. Patients and surgeons have been increasingly interested in the appeal of less scarred and reduction of complications with smaller incisions. The use of high speed tools for osteotomies can also be very destructive to bone with thermal necrosis. Lam et al reports of high speed tools for osteotomies or soft issue release were excluded from this study. Angles were measured through X-ray software and pain scale were noted from EMR by the same author.

Methods

A retrospective analysis of twenty random patients were chosen from an EMR generated 135 patients who underwent MIS bunionectomy from April 1, 2014 to March, 2016. Patients who had MIS proximal phalanx osteotomies or soft issue release were excluded from this study. Angles were measured through X-ray software and pain scale were noted from EMR by the same author.

Our technique for the MIS bunionectomy includes a 6mm incision just proximal to the first metatarsal head-medial prominence. Soft tissue structures are reflected distally and plantarly using a percutial elevator. The joint capsule is not opened and the medial condyle is not resected. However the option of an exostectomy or lateral release is still available if desired. A Steinman pin and fluoroscopy are used to mark the starting point of the deformed head. The angle is then marked on the skin. An osteotomy is made with an osteotome and mallet in the desired correctional plane under fluoroscopic guidance and completed through three passes of the osteotome (central, dorsal, and plantar) and then the lateral metatarsal cortex bone cut is completed [A]. The capital fragment is manually manipulated and translated via heavy hemostat and confirmed under fluoroscopy[B]. We are able to direct the capital fragment to create a decompressive, plantarflexory, or a parabola correcting direction with the angle of the osteotomy. Once desired position is confirmed, a K wire or Steinmann pin is placed medial to the capital fragment and down the first metatarsal medullary canal to buttress the metatarsal head.[C]. This pin is then bent superiorly and cut and the incision is closed with one simple or horizontal non-absorbable suture. Postoperatively, the foot is dressed with mild compression splintage and the patient is able to partial weight bearing with a surgical shoe. The suture is removed in 2 weeks and patient a transitioned to a walking boot. The pin is removed in 4 weeks and physical therapy for joint mobility is begun at 6 weeks postop.

Discussion

The distal first metatarsal osteotomy bunionectomy utilizes the basic concepts of minimal skin incision, limited soft tissue dissection, less traumatic bone cut and temporary percutaneous fixation to improve this procedure. Utilizing a minimally invasive technique allows for a fast and efficient operative time. A smaller incision can produce less soft tissue trauma, less swelling, less pain and certainly a faster recovery. The advantage of using K wire or Steinmann pin is that the bone can be manipulated during surgery and then removed postoperatively. Future research will include pin and postoperative range of motion data and a larger sample size.

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Statement of Purpose

We propose that the minimally invasive technique can help correct a wide variety of bunion deformities, increases patient satisfaction, and provides better comfort to the operated foot.