Opening Base Wedge Osteotomies in Hallux Valgus Correction

Are Anatomic Plates the Answer?

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KEYWORDS

• Opening base wedge osteotomy • Hallux valgus • Bunionectomy • First metatarsal • Arthrex POW plate

KEY POINTS

- Opening base wedge osteotomies can provide adequate reduction of large IM angles with predictable results utilizing anatomic locking plates.
- Opening base wedge osteotomies can provide reduction of HAV deformities without shortening of the first metatarsal that can be seen with other procedures.
- Anatomic locking plates can provide a rigid construct for an osteotomy to decrease risk of nonunion.

There are more than 100 procedures described for the surgical correction of a hallux abducto valgus (HAV) deformity. Procedures range from capsulotendon balancing to head or basilar osteotomies and even double osteotomies of the first metatarsal.[1] Many of these procedures have failed to gain popularity because of technical difficulty, high complication rates, and lack of appropriate and/or stable fixation methods. There are a few procedures that have stood the test of time and have even become easier to perform because of advances in fixation techniques and materials. An example of this would be the lapidus arthrodesis for a large first-second intermetatarsal angle (IMA). The lapidus over the years has become more favorable because of better fixation, even for those physicians who were intimidated by the procedure. There are still those who avoid the lapidus because of concerns of fusing a "normal" joint or needing a patient to remain non–weight bearing for an extended period of time. Even though there are many advocating early weight bearing with a lapidus,[2] many physicians are still fearful of a resultant nonunion or malunion secondary to early weight bearing.

It is for this reason that a need still exists for a stable, proximal procedure capable of reducing a large IMA without significant shortening of the first ray. The opening base

Funding Sources: None reported.
Conflict of Interest: None reported.
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Clin Podiatr Med Surg 30 (2013) 307–312
http://dx.doi.org/10.1016/j.cpm.2013.04.003 **podiatric.theclinics.com**
0891-8422/13/$ – see front matter

wedge osteotomy (OBWO) was first introduced in 1923 by Trethowan. He described it as a procedure for the correction of severe HAV in the juvenile or adolescent patient.[3] He further described the procedure as leaving the lateral cortex intact. In 1983, Beronio writes about maintaining the opening wedge with the resected medial eminence.[4] This procedure has fallen out of favor because of the need for bone graft, lack of stable fixation, fear of jamming the joint, prolonged period of non–weight bearing, and concerns of delayed or nonunions.

New plating systems may provide a solution for many of these concerns and resuscitate a procedure that is nearly extinct. The Arthrex Opening Wedge Low Profile Plate and Screw System (LPS) (Arthrex Inc., Naples, FL) allows surgeons to gain comfort in performing the OBWO because of the incorporated central spacer. The variable-sized spacers allow for "dialing in" of the correction and maintain the opening of the osteotomy. This plating system provides stable fixation and nearly nullifies the need for bone graft. Among surgeons, the concern of weight bearing in a patient still exists, even with this plating system. The next generation of this plate is the Proximal Opening Wedge (POW) plate. The design has moved from the familiar L-shape of the LPS plate to a T-shaped design more consistent with the tibial opening wedge plates (**Figs. 1–3**). In addition to a design change, this plate offers locking screws, which allows for a much more rigid construct that will afford earlier weight bearing.

SURGICAL TECHNIQUE

With the patient secured to the table in a supine position, hemostasis is obtained with a calf or thigh tourniquet. An incision is made extending from the base of the proximal phalanx to the first metatarsocuneiform joint. Dissection is carried down to the metatarsal. A lateral release is performed distally with resection of the medial eminence. The medial eminence may be placed in saline for later use. Proximally, at a point 1.0 to 1.5 cm distal to the metatarsocuneiform joint, a 0.062-inch Kirschner wire is driven from dorsal to plantar into the lateral aspect of the metatarsal so as to protect the lateral hinge of the osteotomy from being broken. Care should be taken to verify that the wire is driven perpendicular to the weight-bearing surface as opposed to the metatarsal itself. This is to avoid any elevatus of the metatarsal. The periosteum is then lifted on the medial aspect of the metatarsal where the cut is to be made. At this point, a sagittal saw is used to make a single transverse osteotomy medial to lateral, parallel with the already placed guide wire. Again, care is needed not to breach

Fig. 1. Comparison of new POW plate (*left*) and first-generation LPS plate (*right*).