

Addressing Hallux Valgus in the Metatarsus Adductus Foot Type

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INTRODUCTION

Metatarsus adductus is a congenital foot deformity characterized by a uniplanar deformity where the metatarsals are angulated at the Lisfranc's joint causing adduction of the forefoot in relation to the midfoot and hindfoot (1). The occurrence of metatarsus adductus has been reported to be 1 to 2 cases per 1,000 (2,3). Metatarsus adductus is the most common congenital foot deformity in the newborn (3) with a male predilection as high as 80% (2). Fetal constraint is the most common cited etiologic factor with compression of the forefoot with the legs crossed across the body (2).

Obvious congenital deformities such as calcaneovalgus and talipes equinovarus (clubfoot) are quickly identified at birth and treated appropriately. Since there are no standard foot screening methods or protocols of newborns for minor deformities such as metatarsus adductus, these go untreated and will surface as problems later in life. As clinicians, we see metatarsus adductus in older children and adults on a regular basis, confirming the lack of recognition at infancy.

The metatarsus adductus foot type is associated with a number of clinical challenges for the podiatrist. Some of the common pathologies include Jones fractures, pain due to the prominence of the fifth metatarsal base, premature non-traumatic arthrosis of the second and third tarsometatarsal joints, lateral column foot pain, and severe bunion deformities. When metatarsus adductus is seen in the high arched foot, pathologies worsen and treatment is even more demanding and challenging. These feet are associated with lateral ankle instability, chronic peroneal tendinopathies, dorsal tarsal metatarsal joint exostoses with or without peroneal nerve irritation, and chronic dorsolateral foot pain (lateral column overload) (4). Often, just fixing a ligament or tendon may not address the global problem of the pes cavus deformity. To that end, in addition to addressing the ligament or tendon, a cavus foot reconstruction may be prudent.

SURGICAL MANAGEMENT

The surgical management of hallux valgus in the metatarsus adductus foot type is one of the most challenging surgical scenarios that we have to deal with. Clinically, the bunion deformity always looks worse than the radiograph. Often,

there is not much of an increased intermetatarsal angle due to the varus deformity of the lesser metatarsals.

When a patient presents to the office with a chief complaint of a bunion, and after the work-up there is significant metatarsus adductus, surgery options really have to be carefully implemented. Unless there is severe dysfunction of the foot, pan metatarsal osteotomies are not typically recommended. However, your typical “go to” bunionectomy may not be the best option. For example, if you typically perform an Austin bunionectomy or equivalent (distal metaphyseal osteotomy), it will likely yield a poor outcome with failure to correct the deformity and/or rapid recurrence of deformity. Decision-making and procedural selection becomes more intense. Expectations of the surgery need to be clearly communicated to your patient as the typical result of “bump gone toe straight” is not likely achievable.

We are familiar with evaluating the intermetatarsal angle on an anteroposterior radiographic view. If you, in part determine your procedure based on that criterion, then remember to calculate the true intermetatarsal angle, which is the intermetatarsal angle plus (metatarsus adductus angle minus 15 degrees). For example, if the intermetatarsal angle measures 8 degrees and the metatarsus adductus angle measures 25 degrees, then the true intermetatarsal angle is 18 degrees, $8 + (25 - 15) = 18$. An Austin bunionectomy may be appropriate for an 8-degree intermetatarsal angle; however, a bunion deformity with an 18 degree intermetatarsal angle will typically need another type of correction.

The following list will include some pearls to remember when addressing large bunion deformities with underlying metatarsus adductus deformity:

- Set realistic expectations. Always discuss the two deformities that you are treating or dealing with, metatarsus adductus and hallux valgus. Explain to your patient that you are limited to the amount of “straightening” of the first metatarsal bone by the patient's anatomy. Even though pain should resolve and the foot will clinically look better, there will still be a residual bunion and the toe will not be straight. I typically show them that all of their toes deviate laterally due to the medial drift of the metatarsal bones. Remember the toes move in the opposite direction of the metatarsals.
- Avoid distal metatarsal osteotomies. I am always more aggressive in correction by doing a base

wedge osteotomy or a Lapidus. This is the case in juvenile hallux valgus and with underlying metatarsus adductus. You will sometimes need to slightly overcorrect your bunion correction. You are less likely to get a varus deformity in the metatarsus foot type with a slightly negative intermetatarsal angle than in the rectus foot type.

- Consider an Akin. It is difficult to get a straight toe after the metatarsal work is done. Clinically it helps with appearance.
- Consider a second and third metatarsal osteotomy if the deformity is mostly of the medial three metatarsals, which is quite common. After the second and third metatarsals have been shifted laterally, now you have more room to get the first metatarsal over. You can then do a Lapidus, Scarf, or base-wedge osteotomy.
- Consider a first metatarsophalangeal joint (MTPJ) fusion when there is an element of degenerative joint disease or if you are considering a pan metatarsal head resection in a severe case of laterally windswept toes. You can be assured that when the fusion is done, the toe is not going to laterally drift and you will not lose correction. A first MTPJ fusion should always be on your radar screen for a “jumbo” bunion deformity. We have all seen recurrence of a bunion with a Lapidus due to playing at the intercuneiform joint, however, you will be hard pressed to find a recurrence of a bunion after a first MTPJ fusion. In the older patient with

advanced long-standing deformity, remember to consider a first MTPJ fusion.

- Pick your battles. Let’s face it, we are surgeons and we fix things. There is nothing wrong with being honest with your patient telling them that unless they can’t live with it...they should just live with it. As you know, most patients think a bunionectomy is a simple procedure where you shave the bump and call it a day. After a thorough review of what would need to be done to fix the problem appropriately, the best answer may be wearing wider shoes and using pads/cushions. If you are both up to the challenge and investment of time and energy, then fine, do the surgery. Otherwise, there is no harm in treating it conservatively. I tell my patients “Bunions won’t kill you, they just make you suffer a little.”

CASE REPORTS

The first case is in a 14-year-old girl, who was active with cheerleading and volleyball. She presented with the chief complaint of a painful bunion deformity. Evaluation of her anteroposterior radiograph revealed moderate metatarsus adductus with a bunion deformity (Figure 1). I knew an Austin would not hold up in the long run. I chose to do a closing base-wedge osteotomy. When you look at the postoperative radiograph, you will notice a slight over correction of the intermetatarsal angle (Figure 2). In order to get a congruous joint, you will need to do that at times.



Figure 1. A 14-year-old female with moderate bunion deformity with underlying metatarsus adductus.



Figure 2. View of a closing base wedge osteotomy of the first metatarsal. Note the slight over-correction of the intermetatarsal angle.



Figure 3. View of a 24-year-old female with metatarsus adductus and bunion deformity.



Figure 4. Postoperative view after a Lapidus bunionectomy. Note the slight negative intermetatarsal angle.



Figure 5. Radiographic view of a 62-year-old female with severe metatarsus adductus deformity.



Figure 6. View after second and third metatarsal osteotomies with a Lapidus bunionectomy.

A 24-year-old female presented to the office wanting her bunion fixed. Her pain was on the “bump” and she had trouble wearing dress shoes, which were necessary for her work. Radiographs revealed a metatarsus adductus with a moderate bunion deformity (Figure 3). Again, this is a case where an Austin bunionectomy is not going to give you the correction that you need. I chose to do a Lapidus bunionectomy. Notice the slight over-correction of the intermetatarsal angle (Figure

4). By doing this, I was able to get a congruous joint, which should give long-lasting correction.

A 56-year-old female presented to the office with severe deformity of her left foot. She was having trouble wearing conventional shoes and was wearing mostly slipper type shoes. She stood all day sorting mail in a US postal service mailroom. Radiographs revealed severe metatarsus adductus deformity with mid-foot arthrosis (Figure 5). This is one of



Figure 7. Radiograph of a 74-year-old male with long-standing deformity.



Figure 8. Radiograph after a second and third metatarsal osteotomy with arthrodesis of the first metatarsophalangeal joint. Note the improved position of the second and third toes.



Figure 9. Preoperative radiographs of a 40-year-old female with a large hallux valgus deformity with metatarsus adductus affecting mostly the medial 3 metatarsals.



Figure 10. Postoperative radiograph.

those very challenging cases where one has to consider a major reconstruction. I chose to lateralize the second and third metatarsals and then do a Lapidus bunionectomy (Figure 6). Certainly, you could consider a pan metatarsal head resection with a first MTPJ fusion, however, she did not have any metatarsalgia pain and surprisingly she did

not have any midfoot pain where she had arthrosis of the tarsal metatarsal joints. Radiographic evidence of arthritis in this area of the foot is a common finding in this foot type. Remember, premature, non-traumatic arthrosis is common in a high arched, curved foot type.

A 74-year-old male presented with a painful bunion pain

in his left foot (Figure 7). He had trouble wearing shoes and had a stiff big toe joint. I chose to address his second and third toes, which were severely windswept like the great toe, by shortening and lateralizing the metatarsal heads followed by a first MTPJ fusion (Figure 8). He still has some residual deformity, but the preoperative expectations were that he would be able to wear shoes without pain. That was the postoperative result.

A 40-year-old female presented to the office for pain in her great toe joint (Figure 9). She was referred by another provider and was told that she had a very difficult bunion to fix. Looking at her radiographs, an Austin-type bunionectomy was not going to work. This is a fairly common finding in metatarsus adductus where there is varus deformity mostly in metatarsals 1-3 and the fourth and fifth metatarsals are more rectus. Therefore, this case is ideal for a second and third metatarsal osteotomy and bunionectomy of your choice (Figure 10).

In summary, as a podiatrist, we know the first MTPJ better than any other anatomic part of the foot. We feel that we can do bunionectomies blind folded. Ninety-five percent of the time, we do our “go to” bunionectomy and have excellent results. However, when the “jumbo” bunion presents with metatarsus adductus, we have to slow down, and figure out a possible different approach. It is not going

to be easy for you or the patient as there is typically more extensive reconstruction, followed by a period of non-weightbearing.

Remember to have a frank conversation with the patient regarding the complexity of the case and discuss the realistic expectations. There is nothing wrong with not doing surgery if that is what your patient decides. In general, one will need to be more aggressive in correction by addressing the proximal aspect of the metatarsal. Consider a first MTPJ fusion in older patients with long-standing deformity. Think about a second and third metatarsal osteotomy to give you some “elbow room” when realigning your first metatarsal. Finally, do not be afraid to slightly overcorrect the intermetatarsal angle in this foot type.

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