

LONG PLANTAR ARM CHEVRON OSTEOTOMY FOR CORRECTION OF TAILOR'S BUNION DEFORMITY

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INTRODUCTION

Tailor's bunion is a commonly encountered deformity in a podiatric practice. Tailor's bunion or bunionette refers to a laterally prominent fifth metatarsal head. This deformity may also include dorsal or plantar protrusion of the metatarsal head. Patients typically present with the chief complaint of "bump pain" and irritation against shoe gear. Conservative treatment for this complaint includes accommodative shoe gear and analgesics. However, these measures frequently fail to offer adequate relief, and surgical intervention becomes necessary.

A multitude of surgical options exist in the management of the tailor's bunion deformity. These options include simple exostectomy, arthroplasty, and osteotomy of the fifth metatarsal. The surgical approach utilized is often based on the degree of deformity and amount of disability a patient will tolerate. The goal of any surgical intervention is an early return to weightbearing and functional level of activity.

The exostectomy and arthroplasty procedures allow immediate weightbearing, as no osteogenesis is required for optimal healing. This is in direct contrast to osteotomy, where bone-to-bone healing is required. This then places importance on the configuration and fixation technique of the fifth metatarsal osteotomy.

Davies first popularized the exostectomy procedure that involves resection of the lateral prominence of the fifth metatarsal head.¹ This may be adequate in the mild deformity, however it is rarely curative in the moderate or severe deformity. In addition, if the tailor's bunion has a structural or biomechanical etiology, more extensive reconstruction may be required. An arthroplasty, such as described by McKeever, involved resection of the fifth metatarsal head.² Such an arthroplasty completely removes the fifth metatarsophalangeal joint, often resulting in transfer lesions under the fourth metatarsal. It is for this reason that head resection is not considered the procedure of choice unless an osteotomy is contraindicated or in cases in which the metatarsal head is destroyed.

Osteotomy of the fifth ray allows true structural correction of the underlying deformity with preservation of the joint. Hohmann and Sponset described a transverse and oblique transpositional osteotomy of the fifth metatarsal head for mild to moderate tailor's bunion.^{3,4} However, this type of osteotomy tends to be unstable secondary to the relatively small area of bone-to-bone contact. Stability of the osteotomy is required for optimal bone healing and to maintain the fragments in the desired position.

Various modifications in osteotomy design and fixation techniques have been described to overcome the instability of the distal transpositional osteotomy. Several have described a lateral hinge wedge osteotomy to adduct the metatarsal head.⁵⁻¹³ In 1978, Throckmorton and Bradlee introduced the distal Chevron type osteotomy similar to the Austin bunionectomy for the first metatarsal.¹⁴ This distal "V" osteotomy is relatively stable and allows for correction of moderate transverse plane deformities. However, the osteotomy is difficult to perform in narrow metatarsals, and is limited in the amount of sagittal plane correction. Crawford and Friend have advocated the use of an inverted "L" osteotomy or inverted Chevron-type osteotomy for moderate deformities.^{15,16} The procedure is stable with a long plantar arm that allows for rigid internal fixation with screws.

This procedure is an alternative for the treatment of mild to moderate tailor's bunion deformity. Although initial results have been very promising, outcome studies will be necessary before the procedure can be recommended as having advantages over other procedures.

The procedure consists of the following steps:

1. Anatomic Dissection
2. Exostectomy
3. Axis Guide Placement
4. Osteotomy
5. Temporary Fixation
6. Final Fixation
7. Closure

CLINICALLY ILLUSTRATED TECHNIQUE

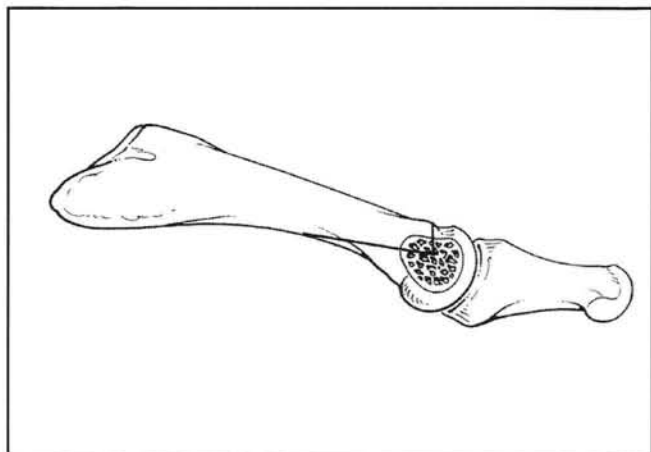


Figure 1. Long plantar arm chevron osteotomy with ~75 to 85 degree angle.

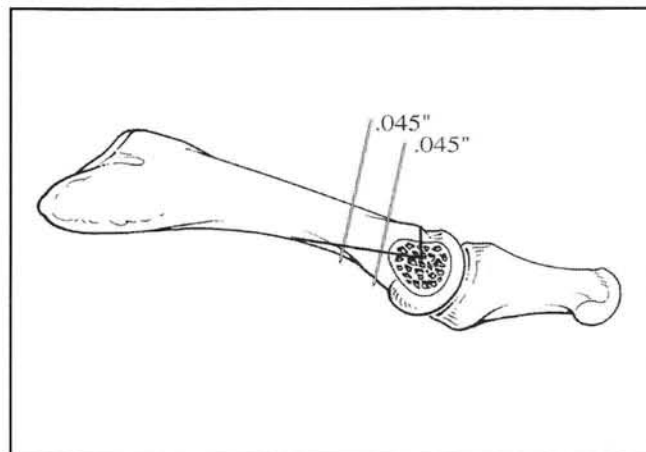


Figure 2. Temporary fixation in place for placement of 2.0 mm screws.

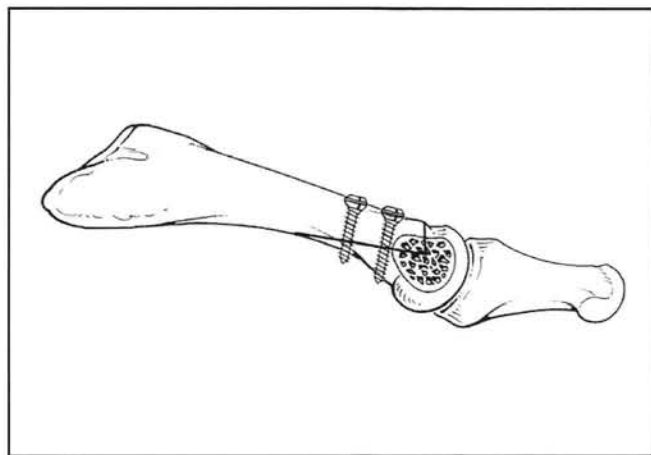


Figure 3. Final appearance with two 2.0 mm screws in place.



Figure 4. Typical clinical appearance of tailor's bunion deformity. Note the plantar lateral hyperkeratosis.



Figure 5. Radiographic appearance of a typical tailor's bunion deformity. Note the increased lateral deviation angle (B), with a relatively normal intermetatarsal angle (A).



Figure 6. Preoperative incision planning located at the dorsolateral aspect of the 5th metatarsophalangeal joint and extending from proximal 5th metatarsal diaphysis to just beyond the 5th metatarsophalangeal joint.

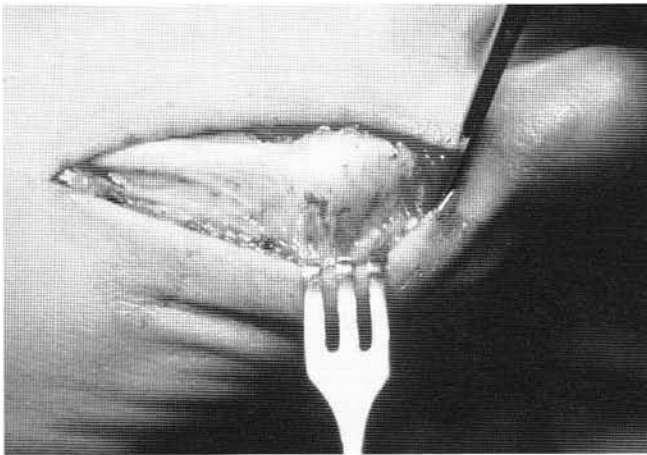


Figure 7. Anatomical dissection to the level of the natural separation of the subcutaneous tissue and deep fascia. Be cautious of the lateral dorsal cutaneous nerve present within the subcutaneous layer.



Figure 8. Linear deep fascial and periosteal incision for distal metatarsal exposure, placed just lateral to the long extensor tendon

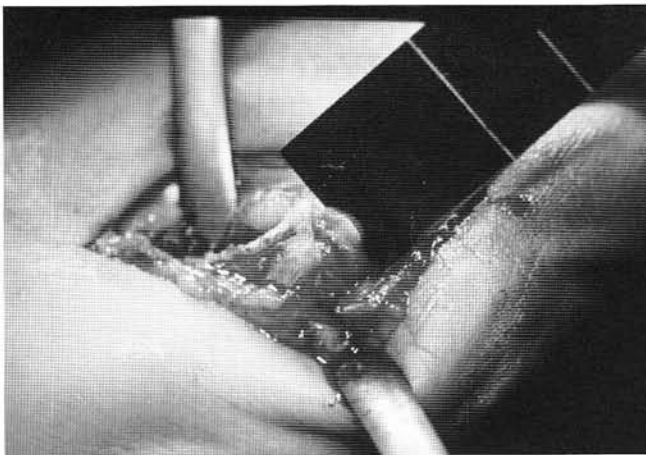


Figure 9. The exostectomy is performed here with an osteotome. It may also be performed with a saw, however be cautious of over-aggressive bone resection.

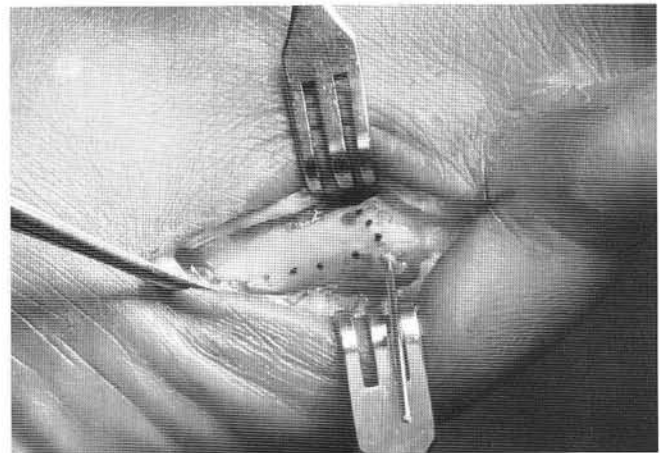


Figure 10. Axis guide (0.045" K-wire) in place with the proposed osteotomy marked on the bone surface. Care should be taken to visualize the plantar exit point to avoid riding-up the metatarsal shaft. When placing the axis guide, locate the wire slightly more dorsal to provide for increased bone on the plantar wing.



Figure 11. Perform the plantar cut first while remaining parallel to the axis guide.

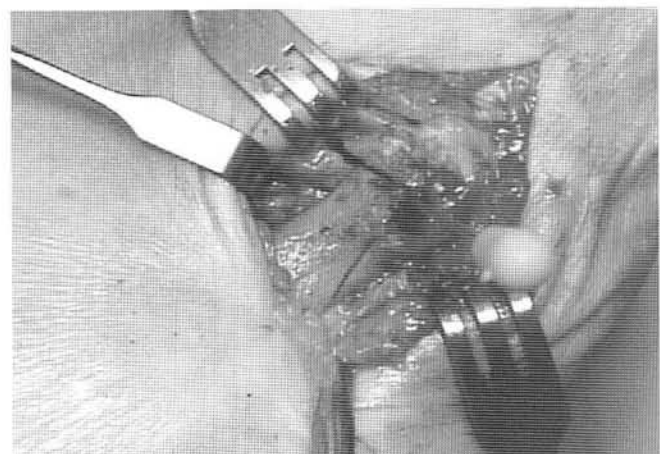


Figure 12. Completed osteotomy with ~80° dorsal exit cut.

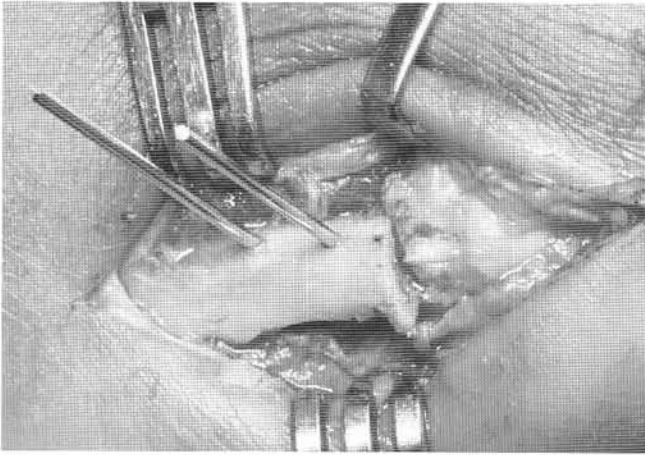


Figure 13. Capital fragment is translocated medially (~50% in this case) and temporarily fixated with two smooth 0.045" K-wires in a parallel fashion. The capital fragment may also be rotated to allow for greater correction while maintaining bone contact proximally.

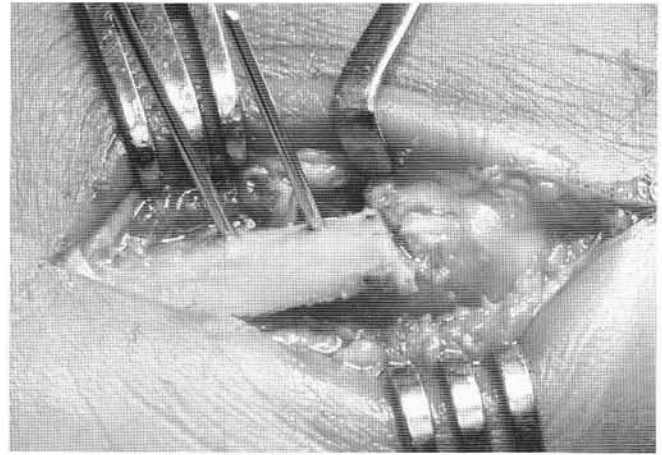


Figure 14. Lateral view of temporary fixation.

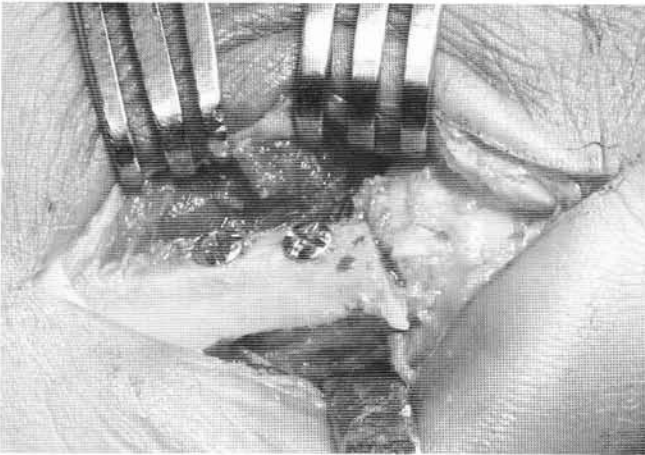


Figure 15. Permanent fixation is achieved utilizing two 2.0 mm screws. A bone clamp may used to assist during fixation. Make certain the proximal screw is in the plantar wing of the osteotomy.



Figure 16. Final view following resection of prominent lateral 5th metatarsal. Note the straight appearance of the metatarsal. Use a rasp or burr to smooth rough edges.



Figure 17. Postoperative DP radiograph of completed osteotomy. Note the degree of correction and screw placement.



Figure 18. Postoperative lateral radiograph of the completed osteotomy. Notice the length of the plantar arm and screw purchase through the plantar cortex.

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