



Proximal Opening Wedge Osteotomy Provides Satisfactory Midterm Results With a Low Complication Rate



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ABSTRACT

Hallux valgus is one of the most common foot deformities. Proximal opening wedge osteotomy is used for the treatment of moderate and severe hallux valgus with metatarsus primus varus. However, hypermobility of the first tarsometatarsal joint can compromise the results of the operation, and a paucity of midterm results are available regarding proximal open wedge osteotomy surgery. The aim of the present study was to assess the midterm results of proximal open wedge osteotomy in a consecutive series of patients with severe hallux valgus. Thirty-one consecutive adult patients (35 feet) with severe hallux valgus underwent proximal open wedge osteotomy. Twenty patients (35.5%) and 23 feet (34.3%) were available for the final follow-up examination. The mean follow-up duration was 5.8 (range 4.6 to 7.0) years. The radiologic measurements and American Orthopaedic Foot and Ankle Society hallux-metatarsophalangeal-interphalangeal scores were recorded pre- and postoperatively, and subjective questionnaires were completed and foot scan analyses performed at the end of the follow-up period. The mean hallux valgus angle decreased from 38° to 23°, and the mean intermetatarsal angle correction decreased from 17° to 10°. The mean improvement in the American Orthopaedic Foot and Ankle Society hallux metatarsophalangeal-interphalangeal score increased from 52 to 84. Two feet (5.7%) required repeat surgery because of recurrent hallux valgus. No nonunions were identified. Proximal open wedge osteotomy provided satisfactory midterm results in the treatment of severe hallux valgus, with a low complication rate. The potential instability of the first tarsometatarsal joint does not seem to jeopardize the midterm results of the operation.

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If the conservative treatment of hallux valgus (HV) does not relieve its symptoms, operative intervention can be considered (1). The choice of the operative technique should be determined by the etiology and severity of the HV and the surgeon's personal experience. An HV deformity is often not an independent condition but part of more complex biomechanical dysfunction (2). Hypermobility or insufficiency of the first tarsometatarsal joint (TMJ) is a causative component of an increased I-II intermetatarsal angle (IMA), leading to severe HV (1).

Regardless of the surgical technique, the aim of the HV operation is to restore the physiologic function of the first ray and alignment of the big toe. In less severe HV deformities, distal metatarsal (MT)

osteotomy can be used; however, proximal osteotomy possesses greater potential for deformity correction and thus is used for more severe cases (3). In addition to proximal open wedge osteotomy, first TMJ arthrodesis can be used to correct severe HV deformities. In contrast to proximal osteotomy, rotational deformities of the MT and the potential hypermobility of the first TMJ can be addressed with tarsometatarsal arthrodesis (4).

Proximal osteotomies can be performed to correct severe HV deformities; however, owing to the potential hypermobility of the first TMJ, a risk exists for the recurrence of the deformity. A paucity of midterm results are available. The aim of the present study was to assess the midterm results of proximal open wedge osteotomy in a consecutive case series of patients with moderate to severe HV, regardless of the stability of the first TMJ.

Patients and Methods

Our local research ethics committee approved the present study. Thirty-one consecutive adult patients (34 feet) with severe HV (hallux valgus angle [HVA])

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Fig. 1. Preoperative radiograph of a 46-year-old female with severe hallux valgus (hallux valgus angle 29°).



Fig. 2. Radiograph of operated foot after proximal open wedge osteotomy (follow-up point 4.2 years).

>30°) underwent surgery from October 2005 to April 2008 by the single senior surgeon (T.N.). Of the 31 patients, 3 (10%) underwent subsequent bilateral foot surgery. Regardless of the clinical stability of the first TMJ, all the operations were performed using the same proximal open wedge technique (Figs. 1 and 2). Three of us (R.O., J.L., T.N.) abstracted the data from the medical records to select the patients for the present investigation.

Through the medial incision, the first TMJ was identified with a needle, and about 1 cm distal to the joint, an osteotomy perpendicular to the long axis of the metatarsal was performed. The osteotomy was opened with a spreader to the amount planned preoperatively. Finally, the osteotomy was fixed using the Arthrex® Opening Wedge Low Profile Plate and Screw System (Naples, FL). Fluoroscopy was used to confirm the amount of correction and the position of the screws in most cases. Distally, the medial eminence of the first metatarsal was excised and used as an autologous bone graft in the proximal osteotomy. The lateral metatarsophalangeal joint capsule was then released through the joint. No additional first ray osteotomies were performed. Four of the patients also underwent gastrocnemius recession to address limitation of ankle dorsiflexion when the knee was extended.

Eleven patients (35.5%; 11 of the operated feet [31.4%]) did not attend the final follow-up visit and were excluded from the present study. The remaining 20 patients (23 feet) were included. Of the 20 patients, 17 (85%) were female. The mean age of the patients was 50 (range 22 to 69) years, and the mean follow-up duration was 5.8 (range 4.6 to 7.0) years. Of the 11 excluded patients, 8 (72%) were interviewed by telephone to identify whether they had required reoperation.

Scoring and Questionnaire

The American Orthopaedic Foot and Ankle Society hallux metatarsophalangeal-interphalangeal (AOFAS) score was recorded before surgery and at the end of the follow-up period (5,6). Preoperatively, the AOFAS score was recorded by the senior surgeon (T.N.), and an independent observer recorded it at the end of the follow-up period. Patients completed a postoperative questionnaire at the end of the follow-up period that included the following questions:

1. "How would you evaluate your current situation in terms of foot condition (normal, nearly normal, abnormal, strongly abnormal)?"
2. "Did the operation help with your hallux problem (yes or no)?"
3. "Would you be willing to undergo the same operative treatment again under similar circumstances (yes or no)?"
4. "Have you had other operations on the same foot after the hallux valgus operation (yes or no; if yes, what)?"
5. "Was there any complication related to the hallux valgus operation?"

Radiologic Measurements

Weightbearing radiographs of both feet were taken in the anteroposterior and lateral projections preoperatively and at a mean of 5.8 (range 4.6 to 7.0) years

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