

# The Modified Valenti Procedure for the Treatment of Hallux Limitus

*The modified Valenti procedure for the treatment of hallux limitus offers the advantage of being technically easy to perform, allows for the intrinsic musculature to remain intact for stability, and is a viable alternative for patients who are not candidates for implant arthroplasty. The operation involves resection of the dorsal one third to one half of the metatarsal head and the dorsum of the proximal hallucal phalangeal base, including all osteophytic lipping and osteochondral defects. To date the procedure has resulted in a significant increase in range of motion, and decreased preoperative pain symptoms. The most common complication seen in a review of 21 cases is sesamoiditis.*

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**H**allux limitus, the limitation of normal dorsiflexion of the first metatarsophalangeal joint during push-off in the stance phase of gait, is a common podiatric condition. Conservative management includes selection of appropriate shoe gear and/or mechanical treatment with custom orthoses; or medical management with anti-inflammatory medications. Medical treatment is limited by side effects and an unpredictable nature of symptom relief.

Surgical treatments reported in the literature for the treatment of hallux limitus include implant arthroplasty; cheilectomy, Watermann osteotomy, Bonnie-Kessel osteotomy, Keller arthroplasty, Regnauld, and arthrodesis (1-6). The original Valenti procedure, described at Hershey, Pennsylvania, Surgical Seminar in 1987, was a joint resection arthroplasty of the first metatarsophalangeal joint in a V-type fashion. Valenti (personal communication) has performed his procedure on more than 600 patients since 1976, with great success. More than 90% demonstrated improved and pain-free range of motion. The authors report a modification of the Valenti procedure for treatment of hallux limitus, which preserves the joint for greater stability.

## Methods

A retrospective study of the dorsal range of motion and subjective complaints of pain was performed on 21 patients undergoing the modified Valenti procedure.

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1067-2516/94/3304-0365\$3.00/0

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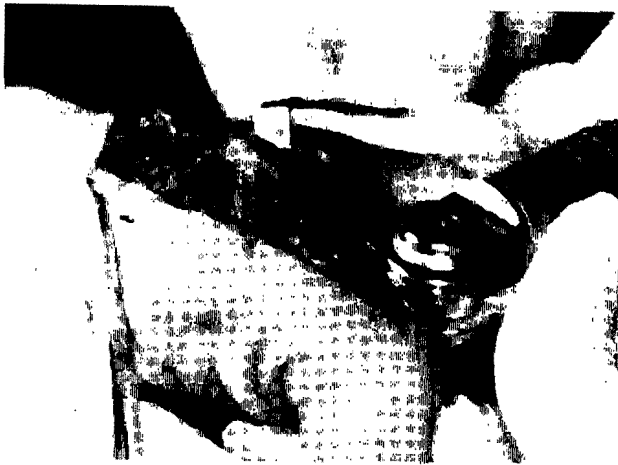
All range of motion measurements were performed by the same examiner to reduce error. The patient population selected to undergo this procedure was young, active patients with symptomatic joint disease, who were not presently candidates for implant arthroplasty.

## Technique

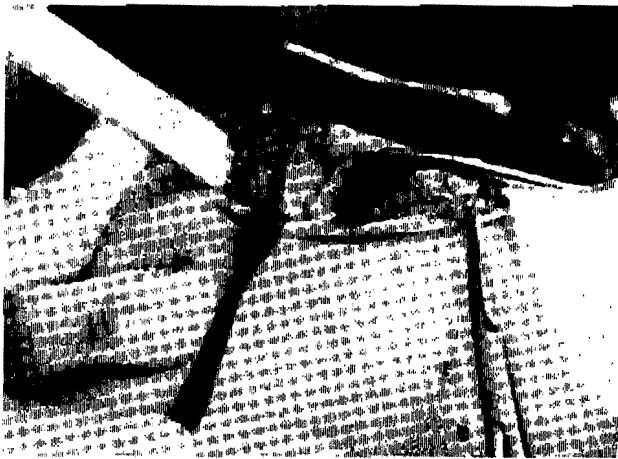
A dorsomedial curvilinear incision centered over the first metatarsophalangeal joint is performed. A linear capsular incision is made, and the first metatarsal head and proximal hallucal phalanx are exposed by sharp and blunt dissection. Any osteophytes are dissected free. The osteochondral defect on the first metatarsal head is resected from distal to proximal, and from below the cartilage defect. The cut is directed superior-proximal from below the defect to behind the hypertrophied and degenerated bone (Fig. 1). Either an osteotome and mallet or power instrumentation may be utilized. A similar procedure is performed on the base of the proximal hallucal phalanx from either proximal to distal or distal to proximal (Fig. 2). The edges are rasped smooth. Any remaining defects in the cartilage are drilled with a 0.062-inch Kirchner wire to stimulate fibrocartilage growth (7). The capsule is hour-glassed closed around the joint (Fig. 3) to prevent bony bridging between the denuded bony surfaces. The skin edges are approximated using appropriate technique. Postoperatively the patients are placed in a wooden-based shoe for 10 days, then an oversized athletic shoe as tolerated. The patients may walk freely after 10 days.

## Results

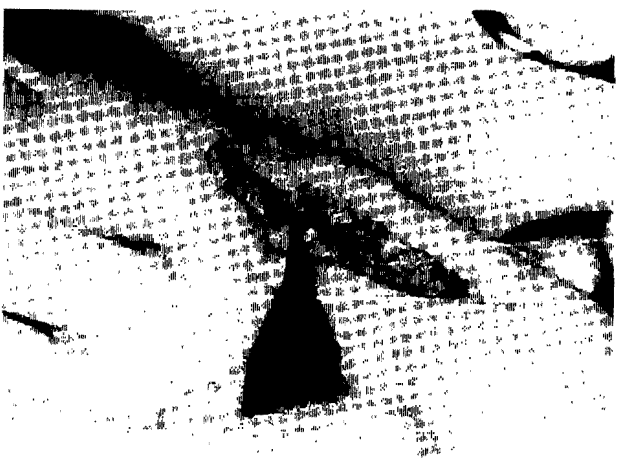
The average age for the patient population in this study was 48 years, with a range of 29 to 62 years. There were 10 females and 11 males. The mean follow-



**Figure 1.** Resection of hypertrophied bone from the first metatarsal head.



**Figure 2.** Resection of hypertrophied bone from the base of the proximal hallux phalanx.



**Figure 3.** Hour-glass closure of the first metatarsophalangeal joint capsule.

up was 19.2 months, with a range of 2.5 to 39.5 months. The mean increase in dorsiflexion was 12.24 degrees with a range of 4 to 25 degrees. Eighteen of 21 patients were completely pain free, and two of the remaining patients were at least 50% pain free. The remaining patient progressed to implant arthroplasty. Fifteen patients were continued with orthoses therapy for metatarsus elevatus. Eighteen of 21 developed a transient, less than 6 months, sesamoiditis, which was relieved by accommodative padding (Table 1).

### Discussion

The procedure described by the authors has the advantages of being technically easy to perform, and it provides an excellent alternative to joint destructive procedures or osteotomies that may require a prolonged healing time. In addition, the viable cartilage and intrinsic musculature remain intact, providing stability to the joint and appropriate toe purchase. Patients undergoing this procedure require limited postoperative care and healing time, thus allowing a rapid return to normal activity (3 to 4 weeks).

Other advantages include excellent salvage ability in those cases in which there is a poor response. The surgeon still has the option to perform implant arthroplasty or arthrodesis. One of the study patients progressed to a successful implant arthroplasty after a poor response to the procedure. There has been no evidence to date of postoperative stress fracture, transfer lesion, or capsulitis of the second metatarsophalangeal joint, as reported with some other procedures such as the Keller operation. Majkowski and Galloway (8) report an incidence of 40% lateral metatarsalgia after undergoing the Keller operation.

Sesamoiditis has been a frequent, although transient complication, responding to conservative management in all cases within 6 months. The procedure fails to completely address a mechanical etiology of hallux limitus, with respect to countering metatarsus primus elevatus. Consequently, the symptomatic limitus may return if mechanical accommodation is not utilized. Fifteen of the 21 patients required orthoses therapy postoperatively. The remaining six patients were post-traumatic in origin, and the authors felt that mechanical accommodation was not required. The procedure should be considered a temporary surgical management rather than curative. There is also a potential for subluxation of the first metatarsophalangeal joint if excessive bone is resected.

### Conclusion

The authors describe a surgical procedure that provides excellent symptomatic relief for patients suffering

TABLE 1. Patient Information

Patient	Age	Sex	Preoperative Range of Motion (degrees)	Postoperative Range of Motion (degrees)	Follow-up (mos)	Origin	Pain Free
1	48	F	7	19	2.5	MPE <sup>a</sup>	Yes <sup>b</sup>
2	31	F	10	23	4.25	Trauma	Yes <sup>b</sup>
3	56	M	3	8	9.0	MPE	Yes <sup>b</sup>
4	34	M	7	21	9.5	MPE	Yes <sup>b</sup>
5	39	M	4	17	13.0	MPE	Yes <sup>b</sup>
6	43	M	5	22	13.5	MPE	Yes <sup>b</sup>
7	47	F	2	8	15.0	Trauma	Yes
8	29	F	0	16	15.5	Trauma	Yes <sup>b</sup>
9	38	F	7	22	15.5	MPE	Yes <sup>b</sup>
10	56	M	9	15	16.5	MPE	Yes <sup>b</sup>
11	62	M	10	17	18.5	MPE	No <sup>c</sup>
12	61	F	3	28	19.75	Trauma	Yes <sup>b</sup>
13	59	M	4	19	21.5	MPE	Yes <sup>b</sup>
14	60	M	9	14	22.0	MPE	Yes <sup>b</sup>
15	47	M	6	12	25.0	MPE	Yes <sup>b</sup>
16	58	M	5	15	26.5	Trauma	No <sup>c</sup>
17	43	F	7	31	27.5	MPE	Yes <sup>b</sup>
18	56	F	8	19	30.75	MPE	Yes <sup>b</sup>
19	55	F	5	9	34.75	Trauma	No <sup>d</sup>
20	44	F	4	21	39.0	MPE	Yes <sup>b</sup>
21	42	M	6	13	41.25	MPE	Yes <sup>b</sup>

Mean improvement: 12.24 degrees

<sup>a</sup> Metatarsus primus elevatus.

<sup>b</sup> Sesamoiditis relieved with accommodation in 6 months or less.

<sup>c</sup> Required total implant arthroplasty.

<sup>d</sup> Greater than 50% pain free but less than 100%.

from painful hallux limitus. The procedure is technically easy to perform and allows for a rapid return to activity. The procedure does not address the biomechanical etiology of hallux limitus, thus, mechanical accommodation is recommended as needed.

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