

# Fixation of Hohmann's osteotomy for hallux valgus

We modified Hohmann's (1923) osteotomy for hallux valgus by internal fixation of the metatarsal head with no need for a plaster cast. Five (2-10) years post-operatively, all 20 patients (32 feet) had complete relief and all but one was satisfied with the cosmetic result. However, we now routinely add osteotomies of the second and third metatarsal neck to prevent, albeit asymptomatic, callosities.

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We have modified Hohmann's (1923) osteotomy for hallux valgus by stabilising the metatarsal head with a Kirschner wire. Thirty-two operations in 20 patients have now been followed-up at 2-10 years.

## Patients and methods

Between 1970 and 1980, 20 patients, all females, with a mean age of 35 (16-67) years, were treated by a modified Hohmann's osteotomy for hallux valgus in Cuckfield Hospital. Twelve bilateral operations were performed, making 32 feet available for study. The average length of follow-up was 5 (2-10) years.

Patients were graded according to the classification of Bonney & McNab (1952). Pre-operative symptoms were Grade 2 or 3; i.e. presentation with either constant symptoms, causing intermittent limitation of normal activity (Grade 2) or occasional symptoms causing no restriction of normal activity (Grade 3). Symptoms were mainly pain at the bunion and pain under the first metatarsophalangeal joint.

The patients were questioned regarding post-operative symptoms, ease of buying shoes and whether shoe size had changed since the operation. The ranges of motion at the metatarsophalangeal and interphalangeal joints were measured with a goniometer. The feet were examined for the presence of callosities beneath the second and third metatarsal heads and over the medial side of the head of the first metatarsal. Antero-posterior and lateral standing radiographs were taken and compared with the pre-operative films. The hallux valgus and the intermetatarsal angles were measured on the radiographs (Figure 1).

## Operative technique

All operations were performed under general anaesthesia with a pneumatic tourniquet on the leg. A longitudinal incision was made on the dorsomedial aspect of the forefoot, extending from the middle of the shaft of the first metatarsal to the level of the first metatarsophalangeal joint.

The incision was deepened to expose the periosteum of the metatarsal bone and the capsule of the joint. The periosteum was incised circumferentially 0.5 cm proximal to the neck of the bone, and elevated and retracted distally. The joint was not opened. A wedge of bone based medially was removed in the subcapital region of the metatarsal, leaving a small protruding spike on the lateral side of the proximal fragment (Figure 2). The metatarsal head was displaced laterally, a small hole was made on the cut surface of the head at its most medial border. After displacement, the spike on the proximal fragment was impacted into this hole, and held in position by a Kirschner wire driven along the shaft of the metatarsal into the head (Figures 2 and 3). Part of the abductor hallucis was then freed distally. The periosteum was closed over the osteotomy and the abductor hallucis sutured under slight tension to the midpoint of the medial side of the capsule with an absorbable mattress suture. A wool and crepe dressing was applied, holding the big toe in abduction.

## Post-operative management

The patient was mobilised immediately, but weight-bearing was restricted to the heel for 6 weeks. After 6 weeks, the Kirschner wire was removed. For the next 6 weeks the patient was allowed to walk flat-footed, avoiding firm pressure on the first metatarsal

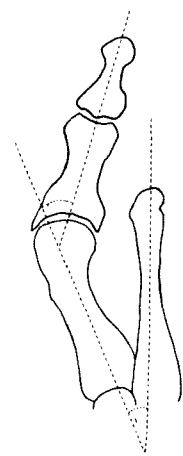


Figure 1. Measurements of the hallux valgus angle and intermetatarsal angle on the pre- and post-operative radiographs.

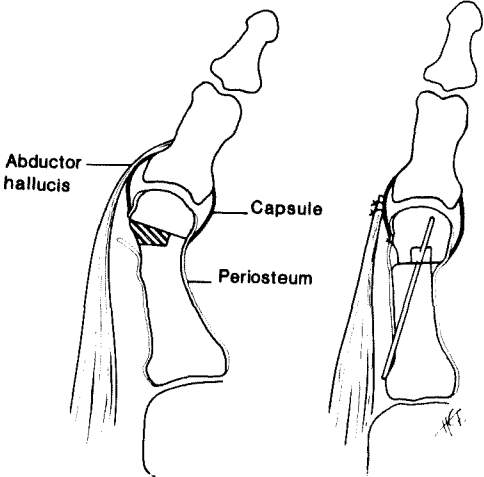


Figure 2. Modified Hohmann's operation. A wedge of bone (hatched segment) based medially was removed from the sub-capital region of the metatarsal, leaving a small protruding spike on the lateral side of the proximal fragment. The proximal fragment was held in position by transfixion with a Kirschner wire. The periosteum was closed over the fracture site and the abductor hallucis sutured to the medial side of the capsule.



Figure 3. Radiograph one day after the operation.

head of the operated foot. Thus, patients could use the foot normally 12 weeks after the Hohmann's osteotomy. There were four superficial wound infections which resolved in 1 week. One delayed union united after an extra month in plaster of Paris.

### Results

At the re-examination, all patients were asymptomatic with no restriction of activity (Grade 4). Seventeen patients (28 feet) found it much easier to buy well fitting shoes and 11 patients (19 feet) required shoes one size smaller. However, two patients still complained of aching feet when wearing high-heeled shoes. All patients except one were happy with the cosmetic result. Nineteen feet had asymptomatic callosities under the second and third metatarsal heads. In all feet pre-operative callosities on the medial side had disappeared. The average range of motion at the metatarsophalangeal joint and the intermetatarsal joint was 19° and 28°, respectively.

Radiographically, the mean intermetatarsal angle pre-operatively was 23° (15°–30°) and at follow-up 22° (15°–30°), and the hallux valgus

Table 1. Hallux valgus angle in 32 feet.

|               | <20° | 20–30° | 30–50° | >50° |
|---------------|------|--------|--------|------|
| Preoperative  | 6    | 14     | 10     | 2    |
| Postoperative | 21   | 2      | 9      | –    |

angle 32° (15°–45°) and 19° (5°–40°), respectively (Table 1).

### Discussion

An osteotomy for correction of hallux valgus is less destructive to the mechanics of the foot than excision arthroplasty. Following Hohmann's (1923) introduction of the osteotomy, his operation has been modified in attempts to provide stability during the healing period (Peabody 1931, Hawkins 1945, Mitchell et al. 1958, Wilson 1963). The operations have all been reported successful, but Allen (1981) reported that following Wilson's (1963) osteotomy all feet showed flattening or reversal of the transverse metatarsal arch and callosities under the second or third metatarsal head. We noted asymptomatic callosities under the sec-

ond and third metatarsal heads in 19 of our 31 feet, and we have now routinely added osteotomies of the second, third and sometimes fourth metatarsal necks to our operation for hallux valgus.

We have not performed the operation in cases with symptoms and signs of advanced arthrosis of the first metatarsophalangeal joint; our operation is mainly aimed at an earlier stage of hallux valgus with symptoms caused by metatarsus primus varus. Although our technique shortens the first metatarsal it may prevent more serious sequelae of hallux valgus; most of our patients were below 50 years age.

## References

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