OBlique Displacement Osteotomy for Hallux Valgus

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The standard operations for the correction of hallux valgus in the middle-aged are not entirely satisfactory when applied to the same condition presenting in adolescence. Most of these procedures, although they correct the deformity, interfere to some extent with the efficiency of the foot. This is of little importance in the older patient, who is unlikely to put heavy strain on the site of the operation, but it can be a disability in younger people, who may be involved in considerable physical exertion. Dissatisfaction with the results of treatment of hallux valgus in the adolescent has led to the introduction of a variety of corrective operations. These were fully reviewed by Cholmeley (1958), who came to the conclusion that the Hohmann operation (1948) gave the best results. About the same time Mitchell, Fleming, Allen, Glenney and Sanford (1958) published the results of Mitchell’s corrective operation.

Before these operations were described surgeons had believed that correction of the primus metatarsus varus was the secret of success, and several osteotomies were suggested to accomplish this: for instance, Ellis (1951) described how this could be achieved by stapling the basal epiphysis of the first metatarsal. In the Hohmann and Mitchell operations the primus varus is accepted and the valgus is corrected by an osteotomy of the neck of the metatarsal with displacement of the metatarsal head laterally. Both the operations have the disadvantage of producing a small distal fragment, requiring careful shaping of the osteotomy surfaces and often internal fixation to obtain stability. Oblique osteotomies to produce the same displacement have been described previously by a number of authors (Ludloff 1918; Mizuno, Suma and Yanuzaki 1956), but they have been rendered unnecessarily complicated, either by the obliquity of the osteotomy, or by the removal of bone wedges.

The operation to be described is presented because it is simple and is less likely to result in complications. It can also be carried out as rapidly as the standard procedures used in older patients.

THE OPERATION

This consists of an oblique osteotomy of the distal third of the first metatarsal, combined with trimming of the exostosis. The distal fragment is displaced laterally, the metatarsal shortened and the position stabilised by putting the big toe into a position of over-correction. The operative steps are as follows: 1) the curved incision is dorsi-medial and is made over the exostosis (Fig. 1). This allows a flap to be reflected plantarwards to give satisfactory access to both the osteotomy site and the exostosis. 2) The bursa over the exostosis is reflected as a flap based distally. The metatarso-phalangeal joint is opened only enough to give room for the removal of the exostosis, which is removed in line with the shaft. 3) The line of the osteotomy is marked with an osteotome on the dorsum of the neck of the metatarsal (Fig. 2). It starts on the medial side at the proximal end of the exostosis, extending laterally at an angle of 45 degrees (Fig. 7). This is the best angle; a more transverse osteotomy leads to instability, while a more oblique one makes displacement difficult. The neck of the metatarsal should be exposed subperiosteally with the minimum of soft-tissue dissection. It is, however, essential to see the inner end of the osteotomy site. This is greatly facilitated by using the curved end of a MacDonald dissector as a bone lever. A thin-bladed osteotome, three-eighths of an inch wide,
is used for making the osteotomy, the dorsal cut being made first (Fig. 3). Care must be taken to avoid too much splintering of the pointed parts of the bone. A certain amount helps in maintaining stability, but too much interferes with coaptation of the fragments. 4) The head of the metatarsal is now displaced laterally by using an osteotome, three-quarters of an inch wide, to break the lateral cortex and displace the fragment, while the big toe is held in the over-corrected position (Fig. 4). 5) With the toe kept in the over-corrected position the distal
fragment will remain stable. This position is held by an assistant while the bursal flap is sewn tightly down to the soft tissues on the shaft of the metatarsal (Fig. 5). 6) The over-correction is maintained while plastering by inserting a suitable roll of wool into the first web space and fixing it there with mastiche (Fig. 6). 7) A below-knee plaster in the over-corrected position is maintained for two weeks. The toe is then brought into the neutral position without an anaesthetic, and a walking plaster is applied for a further six weeks.

RESULTS

Over the past eight years the operation has been performed thirty-four times in twenty-four patients. Ten patients had bilateral operations. There were no operative revisions. The longest follow-up is eight years, the shortest three months. Twenty-five operations in seventeen patients have been followed up for a year or more. No operations have been done for cosmetic reasons alone—there has always been a complaint of pain over the bunion area. The youngest patient was fourteen and the oldest forty-nine, with the average age twenty-four. The results can be summarised under the following headings: recurrence of deformity; mobility of the metatarso-phalangeal joint; metatarsalgia; rate of union of osteotomy; malunion; and pain.

Recurrence of deformity—Five to ten degrees of valgus was considered to be within normal limits. In only one patient was there a complete recurrence and this was the only failure in the series. In two patients there was a return to 20 degrees of valgus, compared with 30 degrees before operation. This residual deformity did not cause symptoms, probably because the

FIG. 8
Radiographs taken three years after corrective ostectomy on the right foot and trimming of the exostosis on the left. There has been a complete recurrence of the deformity on the left side.

FIG. 9
Figure 9—The appearance of a severe left hallux valgus before operation. Figure 10—The correction maintained one year after operation on the foot shown in Figure 9. Figure 11—The footprint of the same foot shown in Figures 9 and 10 has a normal metatarsal impression.
exostosis had been trimmed at the time of the osteotomy. In three patients simple trimming of the bunion was carried out on the opposite side; but this failed to produce a lasting correction of the deformity (Fig. 8).

**Mobility of the metatarso-phalangeal joint**—There was no troublesome stiffness of the toe after operation. At least 30 degrees of dorsiflexion were regained in all patients; in some plantarflexion was restricted to the straight position, but this gave no disability.

**Metatarsalgia**—In only one patient was there persistent complaint of pain under the second and third metatarsal heads. This was in the same patient who had a complete recurrence of deformity and was considered a failure. In six patients there was some callosity formation under the middle metatarsal heads, but in some of these the callosities had been present before operation. None of these patients complained of significant metatarsalgia. Two patients said that they had some discomfort under the sesamoid bones, but these symptoms were temporary and did not recur.

**Rate of union**—The osteotomy was clinically united by the time the plaster was removed at eight weeks in all patients, but there was rarely radiological consolidation by that time. Those feet which were radiographed at three months showed bony union by that time. Non-union was not seen.
Malunion—Particular care was taken while carrying out the operation to avoid dorsal tilting of the distal fragment. This occurred to a slight extent in two operations. It was feared that this would result in metatarsalgia because of the loss of the first metatarsal to weight bearing. It was not so. The only complaint was from one patient who noticed occasional shoe pressure over the dorsum of the metatarsal head.

Pain—No patient had pain in the metatarso-phalangeal joint or at the osteotomy site.

General assessment—In twenty-five operations of displacement osteotomy for the correction of hallux valgus followed for a year or more there was only one failure. This patient had a complete recurrence of the deformity and complained of pain under the metatarsal heads. He had already undergone an osteotomy of the base of the proximal phalanx some years before. This had been unsuccessful and it is possible that the previous operation interfered with stability of the bursal flap. Immediate correction was satisfactory, but at follow-up a year later the recurrence had already occurred. It is felt that if recurrence is to take place it will do so within that time.

In no patient was plaster immobilisation necessary for longer than eight weeks and by twelve weeks the feet had returned to normal. Figures 9 to 11 show the correction obtained in a severe unilateral hallux valgus, and that afterwards the metatarsal footprint was normal. Figures 12 and 13 show a hallux valgus deformity before operation and that union of the osteotomy has occurred three months later. The correct degree of obliquity of the osteotomy and the displacement is clearly shown. Figures 14 and 15 show the deformity before operation and the correction afterwards.

It is felt that the simplicity of this operation and the results shown in the present follow-up justify including the procedure among the methods for correction of hallux valgus, especially in adolescents.

A number of the operations in the present series were carried out on adult patients. However, it is not suggested that the method should replace the well tried standard operations for a case presenting in middle adult life. It is essentially a procedure designed to correct the deformity in the adolescent or early adult patient.

SUMMARY

1. An oblique displacement osteotomy of the distal third of the first metatarsal is described for the correction of adolescent hallux valgus.
2. No fixation of the fragments is necessary, stability depending upon displacement in the over-corrected position for two weeks.
3. A follow-up of twenty-five operations has shown only one failure, from recurrence of the deformity. There have been no complications.

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REFERENCES


