THE LATE RESULTS OF NAVICULO-CUNEIFORM FUSION

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Between 1946 and 1949 the late Mr Ewan Jack performed naviculo-cuneiform fusion in forty-six feet in twenty-five patients, aged eleven to fourteen, for mobile flat foot with a break at the naviculo-cuneiform joint. This paper reports the long-term follow-up of some of these patients sixteen to nineteen years after operation.

MATERIAL

Of the twenty-five patients originally operated upon, seventeen came for examination, two refused to come, one was dead and five were not traced. Using the same criteria that had been used in the original follow-up (Jack 1953)—that is, balance, function, mobility, relief of symptoms and appearance—each foot was assessed clinically and radiologically and graded into three classes: excellent, good or unsatisfactory.

RESULTS

The results of thirty-two operations were studied. A marked deterioration in the grading was found in a considerable number (Tables I and II).

Ten feet were considered to be excellent. These were symptomless with full function and mobility and no restriction of activity. Nearly all these feet had some residual flattening of the medial longitudinal arch, although the patients themselves considered the feet to look better than before the operation. Wear of the shoes was normal. Radiological evidence of degenerative changes in the nearby joints was absent or very slight.

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>TABLE II</th>
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<tbody>
<tr>
<td><strong>FIFTEEN MONTHS TO FIVE YEARS AFTER OPERATION (JACK 1953)</strong></td>
<td><strong>SIXTEEN TO NINETEEN YEARS AFTER OPERATION</strong></td>
</tr>
<tr>
<td>Result</td>
<td>Number of feet</td>
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<tr>
<td>Excellent</td>
<td>25</td>
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<tr>
<td>Good</td>
<td>13</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
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Six feet were classified as good. These had slight aching after prolonged exercise and showed some restriction of inversion and eversion, accompanied by mild crepitus. There were mild degenerative changes in the talo-navicular joint on radiological examination. One patient had had a fracture of the tibia through the donor site six years after operation.

Sixteen feet were considered to be unsatisfactory. All had pain which restricted full activity. Most patients had experienced pain for five years. Three patients, who were among those operated upon early in the series, had enough pain to consult their doctors, though they had not been referred to an orthopaedic department. It was noted that patients with the most incapacitating symptoms were those who in the early assessment had either complained of...
pain shortly after the operation or had had an unsatisfactory initial result. Examination of the feet revealed considerable restriction of movement at the mid-tarsal and subtalar joints, with crepitus and pain at the extremes of movement. All showed marked flattening of the medial longitudinal arch with prominence of the head of the talus downwards and inwards. Radiographs of the feet in this group revealed degenerative changes of the mid-tarsal joint—especially the talo-navicular component—and in the subtalar joint. In many there was some degree of medial subluxation of the head of the talus.

DISCUSSION

The early encouraging results of naviculo-cuneiform fusion for mobile flat foot have not been maintained. Jack's criteria for embarking on surgical treatment were strict, and every operation was done by himself by the same method. A follow-up of the operation performed by other surgeons in Edinburgh was attempted but it was found that the indications, operative technique and management after operation varied slightly from those suggested by Jack. It was felt therefore that to show the operation in its best light these cases should not be included in the present series.

The operation had previously been condemned by Crego and Ford (1952) as being insufficient to support the flattened longitudinal arch. In their series of nine feet up to nine and a half years after operation only two cases were satisfactory. Of the seven feet with a poor result, five needed a further operation because of pain. Butte (1937), considering the results of the operation from the cosmetic, anatomical and functional viewpoints, found that over 50 per cent were unsatisfactory. He maintained, like Jack, that proper selection of patients was of great importance. It seems from the present review that even in a carefully selected group of patients with a sag at the naviculo-cuneiform joint the long-term results are poor.

Even in the presence of a radiological break at the naviculo-cuneiform joint, it is unlikely that the cuneo-navicular ligaments are alone affected and solely responsible for the flattening of the medial longitudinal arch. Fusion of only one small segment of the complex cannot be expected to prevent collapse of the entire arch.

As sometimes happens after subtalar fusion, degenerative changes develop in the next joints that have to take an extra load after naviculo-cuneiform arthrodesis. These occur first at the talo-navicular and later at the calcaneo-cuboid and subtalar joints. Eventually there is medial subluxation of the head of the talus.

There is no doubt that degenerative changes develop in some untreated mobile flat feet but they seldom give symptoms before middle age. It seems that naviculo-cuneiform fusion hastens these changes. A high proportion of cases now classed as unsatisfactory will no doubt require further operation within the next few years.

SUMMARY

1. The long-term results of thirty-two naviculo-cuneiform fusions for flat foot have been reviewed sixteen to nineteen years after operation.
2. The initial encouraging results of the operation have not been maintained.

REFERENCES