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AN EVALUATION OF OPERATIVE PROCEDURES IN THE TREATMENT OF HAMMER TOE

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Eighty per cent of 63 patients who had undergone 136 surgical corrections of hammer toes in the 6 years prior to this study were improved by operation. In adults proximal phalangectomy was the most successful procedure to relieve symptoms and is suggested as the operation of choice. Flexor to extensor tendon transfer was successful in children but not in adults. It is proposed that the operation be performed in an out-patient basis whenever possible.

Key words: hammer toe; proximal phalangectomy; flexor to extensor tendon transfer; proximal interphalangeal joint arthrodesis

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Ever since Boyer in 1816 published the operation of extensor tenotomy for the correction of hammer toes a multitude of surgical techniques have been described. These have ranged from conservative soft tissue procedures to, at the other extreme, amputation (Ely 1926). In spite of this the literature does not contain any reviews of the various procedures and the choice of operation has therefore been based upon the surgeon's personal preference rather than sound scientific principle. It was for this reason that this research was undertaken.

PATIENTS AND METHODS

All patients who had undergone surgical correction of hammer toes in the previous 6 years were invited to attend for review. The operations had been randomly performed by all grades of surgical staff and all patients were interviewed and examined by the same impartial observer.

The patients were asked to assess the success of their treatment by choosing from three alternative descriptions: (a) excellent, i.e. marked improvement and satisfaction; (b) fair, i.e. some improvement and satisfaction; (c) poor, i.e. no improvement or deterioration and dissatisfaction. Two points were awarded for an excellent result, one for a fair result and none for a poor result. In this way it was possible to give each operation a score, i.e. the actual points awarded were expressed as a percentage of the maximum points possible.

RESULTS

Sixty-three patients who had undergone 136 corrections of hammer toes attended for review. There were 22 cases of proximal phalangectomy (Trethowan 1925), 56 cases of flexor to extensor tendon transfer (Taylor 1951), 28 cases of excision arthrodesis of the proximal interphalangeal joint (Soule 1910), 15 cases of excision arthrodesis of the proximal interphalangeal joint with Kirschner wire fixation (Taylor 1940), and 15 cases of peg and socket arthrodesis of the proximal interphalangeal joint (Higgs 1931). The average age at the time of surgery was 46.0 years and the average length of follow-up was 2.63 years.

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Table 1. Overall results of operations as judged by relief of presenting complaints

	Excellent	Fair	Poor	Score	
Proximal phalangectomy	77% (17)	5% (1)	18% (4)	80%	
Flexor to extensor transfer	34% (19)	50% (28)	16% (9)	59%	
Proximal interphalangeal arthrodesis					
Excision only	32% (9)	43% (12)	25% (7)	54%	average 60%
Excision and fixation with Kirschner wire	40% (6)	30% (5)	30% (4)	57%	
Peg and socket	66% (10)	14% (2)	20% (3)	73%	

(Figures in brackets indicate actual numbers of operations)

Eighty per cent of those interviewed were improved by operation (Table 1) but the success of each method depended to some extent upon age (Table 2).

Further analysis relating the results to the sex of the patient or to the position of the distal interphalangeal joint prior to surgery failed to establish a correlation.

The complications related to particular operations were as follows: shortness and flailness of the toe was reported in five cases (23 per cent) of proximal phalangectomy. Medial or lateral deviation of the operated toe at the proximal interphalangeal joint was found in six cases (10 per cent) of proximal interphalangeal joint arthrodesis. These were distributed equally between the three types of arthrodesis. Fanning of the toes, i.e. hyperextension at the metatarsophalangeal joint and an inability to flex the toes was mentioned not infrequently by some children who had undergone flexor to extensor tendon transfer but this however was not a serious complication.

Table 2. Results of operations related to age

	3–15 years	Over 16 years
Proximal phalangectomy	– (0)	80% (22)
Flexor to extensor tendon transfer	90% (23)	49% (33)
Proximal interphalangeal joint arthrodesis	– (0)	60% (58)

(Figures in brackets indicate actual numbers of operations)

Evidence of fusion was found in only 64 per cent of the arthrodesis operations and was not related to relief of symptoms since in those cases where fusion had occurred the score was 88 per cent and in the group where fusion did not occur the score was 85 per cent.

Thirty-three per cent of the operations were performed on an out-patient basis; for the remainder the patients were admitted to hospital for an average of 8.5 days. The out-patients resumed work after an average convalescence of 5.5 weeks whereas for the in-patients it was 9.0 weeks. When only one toe was operated upon in-patients returned to work after an average of 6 weeks as compared to 5 weeks for out-patients. (In these single toe operations the two groups of patients were comparable with regard to age, sex and co-existing medical problems).

DISCUSSION

In this series 23 flexor to extensor tendon transfers in 10 children gave a score of 90 per cent. These results are almost identical to those in a series of 68 operations, mostly in children, reported by Taylor (1951). His results when converted to a score as in this paper were 88 per cent. Similarly, operations on 45 mainly children's feet reviewed by Pyper (1958) gave a converted score of 90 per cent. Therefore, this procedure which appears to give consistently good results and should not affect the growth of toes is to be recommended for children.

Many techniques of proximal interphalangeal joint arthrodesis have been described (Soule 1910, Higgs 1931, Young 1938, Taylor 1940, Selig 1941) but there are no published figures regarding their success. In this survey the peg and socket method was the best way of performing the operation but it was not quite as successful as proximal phalangectomy in relieving symptoms. Trethowen (1925) was the first to indicate the success of this technique and Classman et al. (1949) subsequently reported 54 proximal phalangectomies producing "excellent cosmetic results" with "active control regained" but added no further information. These results are at slight variance with this survey where four patients (18 per cent) complained of a poor cosmetic result and lack of digital control. However, it should be mentioned that at the time of follow-up these patients were free of pain and it was pain which was their original presenting complaint. This operation which can be performed on an out-patient basis should therefore be considered the method of choice for adults.

In this series the in-patients were off-work for approximately twice as long as the out-patients. This can probably be explained by the fact that the in-patient group often had associated medical problems. They were also older and usually had several toes operated upon at the same time (average 2.0). The out-patients however were often fitter, younger and usually had only one toe operated upon (average 1.6). It is interesting that for single toe operations in otherwise comparable groups the in-patients were off-work longer than the out-patients.

CONCLUSIONS

1. All operations reviewed were basically successful in relieving the presenting complaint.
2. In adults proximal phalangectomy was the most successful procedure and should be considered the operation of choice.
3. Proximal interphalangeal joint arthrodesis performed by the peg and socket technique was the second most successful procedure for the relief of symptoms in adults and is a useful alternative operation for those patients who are reluctant to accept a grossly shortened toe.
4. Flexor to extensor tendon transfer was useful only for children.
5. Fusion was not required for a successful result when arthrodesis was attempted.
6. The operation should be performed on an out-patient bases whenever possible and this approach seemed to be especially useful for children and single toe operations.

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