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A. J. BEARD and I. A. TRAIL

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THE "S" QUATTRO IN SEVERE DUPUYTREN'S CONTRACTURE

A. J. BEARD and I. A. TRAIL

From Wrightington Hospital for Joint Diseases, Wigan, UK

Postoperative traction, using the "S" Quattro external fixation device, improved the initial correction in 17 of 18 fingers treated by limited fasciectomy for severe proximal interphalangeal joint contracture in Dupuytren's disease. Unfortunately significant recurrence occurred in eight within 1 year and only five maintained improved function. Complications included infection, loosening, recurrence, stiffness and amputation.

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Significant contracture of the proximal interphalangeal (PIP) joint in Dupuytren's disease is complicated by contracture of all the soft tissue elements as well as the diseased fascia. Thus, complete excision of the fascia may not produce a PIP joint that can extend fully, the residual contracture being due to changes in the skin, flexor tendon sheath, flexor muscles, palmar plate, oblique retinacular ligaments of Landsmeer, the collateral and accessory collateral ligaments and changes within the articular cartilage and subchondral bone (Tonkin et al, 1985).

Andrew's (1991) anatomical study of amputated fingers with PIP contractures of 90° or more, reported that serial excision of skin, fascia and the oblique retinacular ligaments followed by division of the flexor sheath and check-rein ligaments did not release the contracture. When the accessory collateral ligaments were released, five of the seven fingers extended completely. The remaining two fingers required release of the palmar plate to achieve full correction.

Traction as an adjunct to surgery has been reported. Messina and his colleagues (Bailey et al, 1994; Brandes et al, 1994; Messina and Messina, 1993) used a continuous traction device, which stretched the contraction deformity. In those patients who were treated by the device only, removal of the device was followed by rapid recurrence. However, as a prelude to surgery the device made the dissection easier and the end result was improved. These findings were confirmed by Hodgkinson (1994) when reporting the early results of his PIPSTER device.

The "S" Quattro is a simple device which can be applied easily and quickly. It was devised by Fahmy (1990; Fahmy and Harvey, 1992) for use in phalangeal fractures and can be arranged to deliver either compression or distraction forces. In this series the distraction force was utilized to extend the PIP joint in an attempt to improve the results of surgery in cases of severe and recurrent Dupuytren's disease.

MATERIALS AND METHODS

The "S" Quattro device was used in 18 fingers with flexion contractures of at least 85°. A complete fasciectomy was performed prior to application of the device.

The skin was closed where possible with Z-plasties or the open palm technique of McCash was used. Dermofasciectomy was not performed. The "S" Quattro was applied when a contracture of greater than 40° persisted despite excision of all diseased fascia. The device was applied in distraction mode, the pins being inserted percutaneously using a power drill, one into the proximal phalanx, the other into the middle phalanx. The pins entered the cortex at an oblique converging angle. Two springs were applied: proximally a silver distraction spring and distally a black compression spring. The device was maintained for 2 weeks, during which active and passive therapy for the other fingers and the MP and DIP of the involved digit was given. After removal of the device all joints were mobilized. An extension splint was worn at night for 6 months.

At review the current function was recorded, including goniometer measurement of movements of all joints, sensory testing using moving two-point discrimination, fingertip to distal palmar crease distance in maximal extension and flexion and grip strength using the Jamar dynamometer. Clinical photographs and X-rays were also taken.

RESULTS

All 13 patients who had the "S" Quattro device used to correct Dupuytren's contractures at Wrightington Hospital were reviewed. There were 12 men and one woman. Five patients had two fingers treated. Their ages ranged from 49 to 71 years with an average of 60 years. Four ring fingers and 14 little fingers were involved. Ten procedures were performed for recurrent disease. All patients had preoperative fixed flexion deformities of the proximal interphalangeal joints of 85° or more. One frame was removed immediately because of vascular compromise. One patient had rapid recurrence in both fingers treated with the device and required further surgical intervention. Two patients had subsequent amputation of a finger, one for recurrence, the other for stiffness. Follow-up of the 13 remaining fingers ranged from 12 to 32 months with an average of 15.

The average preoperative flexion contracture was 93° (range 85-120°). Average maximum active flexion was

to 104° (range 90–130°). The average preoperative arc of active motion was 10° (range 0–40°).

At follow-up the average flexion contracture was 56° (range 25–90°). Average active flexion was to 89° (range 35–110°). The average active arc of motion was 34° (range 0–75°).

Eight fingers achieved better maximal extension of 60° or more. Eleven fingers flexed to 90° or more. Six had a range of motion greater than 30°. Only five fingers achieved all three of the above criteria.

Four patients stated they were very pleased with their results, five felt they were improved. Four were disappointed.

Three pin tract infections occurred. In one finger this led to removal of the device 9 days after operation. One other device was removed early, at 7 days, because it became loose. One patient developed persistent localized pain and discoloration at the site of the proximal pin.

X-ray showed significant joint damage in six fingers and minor changes in all the others. The worst results occurred in fingers with significant changes on X-ray.

DISCUSSION

In fixed flexion contractures caused by Dupuytren's disease the results of surgical release are often disappointing. A high rate of recurrence is common and

stiffness frequently follows radical release, especially when the palmar plate is released. Amputation is reported in 9%. The technique described gives an additional option in treating these difficult cases but there is a high rate of complications. However, in some fingers good results can be achieved.

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Dr A. J. Beard, 11 Sutherland Avenue, Wahroonga 2075, Australia.

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