Acta Orthop. Scand. *58*, 239–240, 1987

Hyperextension injuries of the PIP finger joint

Comparison of early motion and immobilization

In a prospective study of traumatic lesions of the volar fibrocartilage of the PIP joint, 56 patients were randomized to treatment by immobilization for 3 weeks and 56 patients, to purely analgetic treatment without immobilization. Seventy-eight patients were reexamined 6 months later and 77 patients, in a follow-up study 2–3 years after the injury. No difference was found between the two groups with respect to subjective complaints or objective signs.

Correspondence: Dr. Nørregaard, Holger Drachmannsvej 4, DK-8000 Århus C., Denmark

Ole Nørregaard
John Jakobsen
Kurt Krøyer Nielsen

Department of Orthopedics, Aalborg Hospital, DK-9000 Aalborg, Denmark

Introduction

Lesions of the volar fibrocartilage of the PIP joint were described by Moberg & Stener (1953) and Kuczynski (1968). Just as the collateral ligaments of the PIP joint prevent lateral deviation, the volar fibrocartilage restrains hyperextension of the PIP joint. Consequently, lesions of the volar fibrocartilage are often preceded by violent involuntary hyperextension.

Meyer (1980) and Heim (1980) recommended treating this lesion with 3–4 weeks of immobilization, whereas Thomsen et al. (1979) concluded that 1 week of immobilization was sufficient.

We have compared early motion and immobilization.

Patients and methods

Totally, 112 consecutive patients with hyperextension trauma to the PIP joints of any of the four ulnar fingers who attended the casualty ward at our hospital from November 1, 1982, to November 1, 1983, took part in the study. The presence of a lesion of the volar fibrocartilage was concluded when the four following signs were all present: 1) local volar tenderness, 2) pain at maximal flexion, 3) relief from pain in the intermediate position, 4) recurrence of pain at maximal extension. Joints with additional lesions were not included in the study. The patients were randomized to Group I on even dates of trauma (56 patients) and to Group II on uneven dates (56 patients).

The treatment in Group I comprised 3 weeks of immobilization with a 15–20 cm foam-rubber-covered aluminum splint applied to the volar surface with the injured joint flexed 15 degrees, the MP-joint 80–90 degrees, and the wrist extended 30 degrees. The patients in Group II were treated with analgetics and no immobilization. They were advised to start active movements a few days after the trauma.

Six months after the injury, 78 patients (44 in Group I and 34 in Group II) were reexamined. A further follow-up of 77 patients was performed about 3 years after the injury (43 in Group I and 34 in Group II). The sequelae were graded according to Møller (1974):

\+ mild pain from forceful loading or cold water;
++ moderate pain from tapping or performing normal work;
+++ considerable daily pain, symptomatic restriction of movement, dystrophic appearance.

The age of the patients at the time of injury was 24±11 years. The ages of the two reexamined groups were comparable to the original grouping.

The chi-square test was used for statistical analysis. $P<0.05$ was regarded as significant.

Results

After 6 months, no difference was found between the two groups. Stiffness, coldness, volar-plate tenderness, and a flexional defect were the predominant symptoms and signs in Group I. In 1 case the pulpa-vola distance was 15 mm, whereas in the remaining cases it was between 2 and 6 mm.

Pain during activity, thickened joint, and a flexional defect were the most common sequelae in Group II. In 2 cases the lack of extension was

more than 25 degrees; in the remaining 9, less than 10 degrees. None of the PIP joints was enlarged more than 5 mm. Four fingers had less than 5 degrees of ulnar deviation.

At the 3-year follow-up, still no overall difference was found between the two groups (Table 1). However, the total number of sequelae had decreased, the majority of which were minor ones, with only 3 cases having more than mild pain (Table 2).

Table 1. Number of patients with sequelae in immobilized (I) and primarily mobilized (II) cases. The left column within each group represents results at the 6-month follow-up study, the column to the right the 3-year follow-up study

	I		II	
Number of patients	44	34	43	34
Pain during movement	5	2	7	3
Pain during work	5	2	5	5
Pain during hobby-activities	4	1	4	4
Volar-plate tenderness	8	6	5	6
Stiffness and coldness	11	5	6	3
Thickened joint	7	4	8	8
Extension defect	3	2	5	1
Flexion defect	8	3	7	2
Swan-neck deformity	0	0	1	0
Button-hole deformity	0	0	0	0
Other	3	0	3	3

Table 2. Grading of sequelae according to Møller (1974) at the 3-year follow-up study. I were immobilized patients, II mobilized patients

	I	II
Mild	6	7
Moderate	1	1
Severe	0	1

Discussion

Until 15 years ago, volar-plate injuries were bandaged semiflexed. Kuczynski (1968) and others (Gad 1967, Sprague 1975) recommended that the PIP and DIP joints should be splinted in 15–20 degrees of flexion and the MP joint in 80–90 degrees of flexion, thus preventing contracture. The duration of immobilization, however, has been a matter of debate; recommendations have ranged from 1 to 4 weeks. Sprague (1975) stressed the importance of early active motion, and Kuczynski (1969) emphasized that the immobilization period of the PIP joint should be as short as possible. Thomsen et al. (1979) found no difference with respect to sequelae between splinting 1 week and 3 weeks in 181 patients. These results accord with our study. The rate of sequelae in our 6 months' follow-up was somewhat higher than previously reported (Lee 1963, Møller 1974, Thomsen et al. 1979). The reason probably is that only 78/112 patients could be included in the follow-up study despite several calls to attend. The missing cases probably had relatively minor symptoms. At the 3-year follow-up study, the remaining complaints were minor, agreeing with the results of Lee (1963) and Møller (1974).

We concluded that comfort of the patient and the economic advantages of early motion are obvious.

References

Gad, P. J. (1967) The anatomy of the volar part of the finger joints. *J. Bone Joint Surg.* **49-B**, 362–367.

Heim, U. (1980) Die Behandlung der frischen intraartikularen Bruche der MP- und PIP-gelenke. *Hefte Unfallheilkd.* **141**, 65–74.

Kuczynski, K. (1968) The proximal interphalangeal joint. Anatomy and causes of stiffness in the fingers. *J. Bone Joint Surg.* **50-B**, 656–663.

Lee, M. L. M. (1963) Intraarticular and periarticular fractures of the phalanges. *J. Bone Joint Surg.* **45-B**, 103–109.

Meyer, M. V. (1980) Das verletzte Fingermittelgelenk und seine Behandlung. *Helv. Chir. Acta* **47**, 77–80.

Moberg, E. & Stener, B. (1953) Injuries to the ligaments of the thumb and finger *Acta Chir. Scand.* **106**, 166–186.

Møller, J. T. (1974) Lesions of the volar fibrocartilago in finger joints *Acta Orthop. Scand.* **45**, 673–682.

Sprague, B. L. (1975) Proximal interphalangeal joint injuries and their initial treatment *J. Trauma* **15**, 380–385.

Thomsen, P. B., Hougaard, K., Jørgensen, J. & Barfred, T. (1979) Hyperekstensionslaesioner af fibrocartilago volares i fingrenes proksimale interfalangealled. *Ugeskr. Laeger* **141**, 2955–2957.