Fracture Care By Family Physicians

M. Patrice Eiff, MD, and John W. Saultz, MD

Musculoskeletal problems represent approximately 10 to 15 percent of all office visits to family physicians.[1-3] Although the majority of these problems are chronic, nontraumatic conditions, acute fractures make up a significant portion of most family physicians' practices. In a survey of family physicians, a majority identified orthopedics as an area in which they would have benefited from more training.[4] The spectrum of orthopedic problems in family practice and the initial treatment of acute traumatic orthopedic injuries seen in a family practice residency have been described.[1,5] Characterization of follow-up fracture management by family physicians is lacking.

The family practice residency at David Grant USAF Medical Center (Travis Air Force Base, CA) cares for all patients (approximately 450 a year) with acute, nonoperative fractures seen at the Medical Center. Under the supervision of family practice faculty, residents provide all aspects of care, including initial examination and treatment, definitive casting or immobilization, and supervision of rehabilitation until complete healing is achieved. Formal and informal consultation with orthopedic surgeons is readily available. Because of this large and unique volume of experience with fracture management by family physicians, a descriptive analysis was undertaken to define (1) the distribution of fractures seen, (2) the average number of patient visits for each fracture type, and (3) the average length of time from injury to complete healing.

Chart Review

The patients studied consisted of all patients referred to the department of family practice fracture clinic from the emergency department and all primary care clinics. A care flow sheet was kept during the period in which a patient was cared for in the fracture clinic. The flow sheets of patients seen from January 1988 through September 1989 were examined by one of the authors (MPE). Data recorded from the flow sheets included type of fracture, number of visits to the fracture clinic, and dates of injury and discharge (complete healing) from the clinic. The duration of care from injury to complete healing was calculated for each patient. The criteria for complete healing for all fractures were normal, pain-free range of motion, no tenderness at the fracture site, and no swelling. The patient's date of birth was not recorded on the flow sheet; thus the information obtained from the review could not be stratified by age. Because active-duty personnel move frequently, the complete medical record was not always available for review.

Results

The distribution of the 624 fractures seen during the review period is presented in Table 1. Forty percent of the fractures involved the fingers, metacarpals, and distal radius. Fractures of the toes, metatarsals, and distal fibula represented the next most common group (25 percent of the total).

The average number of visits from initial management to clinical healing is also listed in Table 1. The number of visits ranged from a low of two visits for toe fractures to a high of five visits for carpal navicular, humerus, and distal radius and ulna fractures. The majority of fractures were managed successfully in three or four visits.

The number of days required for clinical healing to occur for each fracture type was recorded as the median value, range, and the 25th to 75th percentile values. The median healing times for fractures managed in the acute fracture clinic were compared with the suggested period of immobilization listed in a primary care orthopedic text[6] (Table 2).

Discussion

Although the age distribution of the 624 fracture patients reported in this paper is not specifically known, the population represented all age groups including active-duty military personnel, children who were dependents of active-duty personnel,

Submitted, revised, 3 November 1992.

From the Department of Family Medicine, Oregon Health Sciences University, Portland. Address reprint requests to M. Patrice Eiff, MD, Department of Family Medicine, Oregon Health Sciences University, 3181 SW Sam Jackson Park Road, Portland, OR 97201.

Table 1. Distribution, Number of Visits, and Healing Time of 624 Acute Nonoperative Fractures.

Fracture	No. (%)	Mean No. of Visits	Days to Healing		
			Range	25%–75%	Median
Phalanges (fingers)	111 (16.5)				
Proximal	50	3.0	5–63	23–39	29
Middle	25	2.6	22–51	23–30	26
Distal	27	2.4	10–72	21–52	31
Not specified	9	2.0	18–41	28–39	37
Metacarpus (excluding 5th)	71 (10.5)	3.6	14–65	29–45	34
Distal radius	70 (10.4)	4.1	12–103	29–56	39
Phalanges (toes)	61 (9.1)	2.0	4–158	15–33	25
Fibula	50 (7.4)	4.1	4–97	29–54	41
Metatarsus	42 (6.2)	3.8	14–99	27–57	41
Rule out carpal navicular	38 (5.6)	2.7	3–83	13–24	15
Clavicle	30 (4.5)	2.9	11–90	22–60	27
5th metacarpus (boxer's)	28 (4.2)	3.1	16–58	28–50	36
Distal radius and ulna	25 (3.7)	4.7	26–84	35–67	47
Volar plate (finger)	22 (3.3)	2.8	12–92	29–42	37
Radial head	19 (2.8)	3.3	6–71	18–44	29
Distal ulna	10 (1.5)	3.7	14–164	28–68	35
Carpal navicular	9 (1.3)	5.0	40–224	50–72	54
Proximal humerus	7 (1.0)	5.0	21–101	34–74	47
Medial malleolus	7 (1.0)	4.0	16–67	30–51	35
Tibia	6 (0.9)	4.3	36–97	53–86	72
Other carpal bone	6 (0.9)	2.5	16–32	24–32	26
Tarsal navicular	5 (0.7)	3.6	NA*	NA	30
Distal humerus	4 (0.6)	5.0	NA	NA	61
Calcaneous	3 (0.4)	3.7	NA	NA	26

*NA = data not available to calculate range.

and military retirees. Many of the fracture clinic patients were active-duty Air Force personnel and consequently were young, relatively healthy adults. During a 21-month period, the fracture clinic cared for 624 patients, representing a total of almost 30 fracture patients each month. Patients in this military clinic were seen perhaps more frequently than they would have been in a private practice setting. The standard procedure of the clinic was to see fracture patients every 10 days to 2 weeks to monitor healing and function, determine when active-duty personnel could return to duty, and maximize the educational experience of residents who were being taught initial and follow-up management of orthopedic injuries. This unusually close follow-up allowed for an accurate assessment of the healing time of fractures in these patients.

The most common fractures seen in this population were fractures of the wrist, hand, and fingers, closely followed by fractures of the toes, metatarsals, and fibula. Thus, distal extremity fractures represented more than 60 percent of the fractures seen in the clinic. Considering this fracture distribution, orthopedic training for family practice residents and orthopedic review courses for practicing physicians should emphasize management of the most common fractures.

The wide range of healing times listed for most fractures is principally related to variability in the complexity of individual fractures and the inclusion of patients of all ages. Healing times for the same fracture would vary considerably in children and adults. In spite of this wide range, most of the fracture types healed within an amazingly narrow range of days from the 25th to 75th percentile. In general, common nonoperative fractures have a consistent healing time with only a few outliers caused by case-specific issues.

One would expect the healing times for the fractures described in this report to be slightly longer than the recommended immobilization times listed in Table 2, because some rehabilitation of the injury is required after removal of the splint or cast. The healing time for most of the fractures was quite consistent with what others have reported. A slightly longer period of post-immobilization rehabilitation was required for

Table 2. Healing Time of Acute Nonoperative Fractures: Acute Fracture Clinic Results Compared with Recommended Healing Time.

Fracture	Actual Healing Time* (Weeks)	Recommended Healing Time† (Weeks)
Proximal phalanx	4.1	3
Middle phalanx	3.7	3
Distal phalanx	4.4	3
Metacarpus (excluding 5th)	4.9	4
5th metacarpus (boxer's)	5.1	4
Carpal navicular	7.7	10
Distal radius	5.6	4–8
Distal radius and ulna	6.7	4–8
Clavicle	3.9	4–6
Fibula	5.9	4–6
Tibia	10.3	10–16
Metatarsus	5.9	3–6
Toes	3.6	2–6

*Time from injury to clinical healing, in weeks.
†Recommended number of weeks of immobilization.[6]

patients with hand and finger fractures, because of the intricacy of hand movement.

The healing time for carpal navicular fractures was unusually short. The median healing time was approximately 7.7 weeks compared with the textbook recommendation of immobilization in the 10-week range. This short healing time occurred even though patients who had a suspected navicular fracture were not included in this fracture group unless an actual fracture was seen at follow-up. Several factors can explain the shorter healing time. Patients with navicular fractures requiring operative fixation were not included in the patient population reported in this study. Because of the risk of nonunion and long-term disability associated with navicular fractures, patients with any early signs of complication were referred promptly to orthopedists. As a result, the spectrum of navicular fractures managed in the fracture clinic included fractures with a better prognosis at the outset. In addition, many of the patients in this study were active-duty military personnel and thus were young, healthy, well-nourished adults.

This study is limited by incomplete demographic information about the patients because a number of medical records were unavailable. Nevertheless, information regarding the number of visits and healing time was carefully recorded by physicians in the fracture clinic, and the patients were monitored closely. We believe that the healing and rehabilitation time for these fractures is sufficiently accurate to allow conclusions to be drawn about the duration of care required for these commonly encountered fractures.

Summary

This report helps characterize fracture management by family physicians. The findings suggest that family physicians can care for a broad range of acute fractures with healing times at least comparable with the standard of care described by orthopedists. A prospective trial would be necessary to assess fully clinical outcomes resulting from specific fracture management. That distal extremity fractures predominated should guide educators in their decision regarding orthopedic training.

References

1. Geyman JP, Gordon MJ. Orthopedic problems in family practice: incidence, distribution, and curricular implications. J Fam Pract 1979; 8:759-65.
2. Sneiderman C. Orthopedic practice and training of family physicians: a survey of 302 North Carolina practitioners. J Fam Pract 1977; 4:267-70.
3. Burleson RJ. A "retro-view" of three years teaching orthopedics to family medicine residents. J Med Assoc State Ala 1980; 50:25-9.
4. Reznick RK, Brewer ML, Wesley RM, Stauffer ES. Orthopaedic teaching: the practicing family doctor's perspective. Orthop Rev 1987; 16:529-35.
5. Alcoff J, Iben G. A family practice orthopedic trauma clinic. J Fam Pract 1982; 14:93-6.
6. Ramamurti CC. Orthopaedics in primary care. Baltimore: Williams & Wilkins, 1979.