Research Article

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Effect of ulnar styloid fracture on functional outcome of Colle's fractures: a comparative analysis of two groups

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ABSTRACT

Background: The negative impact of ulnar sided injuries on distal radius fractures has opened another field of research and is gaining more attention. The aim of our study is to assess the impact of ulnar styloid process fracture on functional outcome of distal radius fractures managed conservatively.

Methods: Radiological and Medical records of 150 patients of distal radius with and without styloid process fractures were retrospectively reviewed. Fractures were classified as per Frykman's classification and patients were assessed for pain, grip and range of motion in addition to other parameters in Mayo's wrist score. The instability at distal radioulnar joint was evaluated and compared in two groups.

Results: There was a measurable difference in motion, strength, pain, or functional scores between the two groups. Mean mayo score at final follow up in Group I was 90 ± 5 and in Group II was 80 ± 4 and the difference was statistically significant (P value <0.05). DRUJ instability was noted in 20 % of patients in Group II and most of them were symptomatic.

Conclusions: We conclude that presence of a fracture of ulnar styloid process with distal radius fracture results in a weak and painful wrist in a significant number of patients. They should be dealt more vigorously and managed effectively to prevent disabling distal radioulnar joint instability.

Keywords: Distal radius fractures, Styloid process fracture, Distal radioulnar joint instability

INTRODUCTION

Over few decades, the treatment of distal radius fractures has changed a lot. Various treatment options ranging from cast with percutaneous pinning to volar plating are well described in literature in different situations. However the treatment of distal radius fractures with ulnar styloid remains controversial. There are studies that found that fracture of ulnar styloid has no impact on functional and radiological outcome on distal radius fracture. Others have found that it is associated with distal radioulnar joint instability, decreased range of motion and grip strength.

The ulnar styloid is an important attachment site for TFCC structures, including volar and dorsal radiocarpal ligaments, the tendon sheath of extensor carpi ulnaris, and the ulnar carpal ligament. These structures especially the ligaments are considered the major stabilisers of DRUJ. For this reason the fractures of ulnar styloid were considered important to determine the stability of DRUJ in distal radius fractures.

The aim of our study is to determine the impact of styloid process fractures on the functional outcome of distal radius fractures.

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METHODS

Patients who had sustained distal radius fracture (Colle's fracture) between November 2012 to October 2013 were reviewed retrospectively at a tertiary care hospital. All these patients were called up for follow up and assessment. Patients with more than 55 years of age of either sex with or without radial styloid fractures without any radiocarpal extension were included in this study. Radiographically only those patients who had been reduced initially to the acceptable criteria's of reduction for distal radius fractures had been included. Only patients who were managed non-surgically were included. Patients with other associated injuries of the same upper or contralateral upper limb were excluded from the study. Patients with other chronic systemic disorders like diabetes, kidney failure or any psychiatric illness were also excluded at the final follow-up. Among 1180 patients who were admitted at our institution during the said period, only 160 met the strict inclusion criteria and their records were reviewed.

There were 50 males and 110 females. Among those 10 female patients did not give consent for final assessment and were excluded from the study. The final assessment was available for 150 patients only. These patients were divided in to two groups, with group I as those without an ulnar styloid fracture and group II as those with an ulnar styloid fracture. Among those, 60 patients had extra-articular distal radius fracture (Colle's fracture-Group II) with an ulnar styloid process fracture while rest (90 patients) had a simple Colle's fracture (Group I).

Assessment was done by mayo wrist score for both the groups and comparative analysis of functional status of two groups was done. The P score was taken as significant when <0.05.

RESULTS

Mean age of our patients was 59±4 in Group I and 61±3 in Group II which was not significant statistically. The number of females outnumber the males in both the groups in our study. Mean follow-up in our study was 18 months (range 6 months to three years). Patients in both the groups were managed non-surgically with a short arm pop cast after closed reduction and cast was removed after 6-8 weeks in all the patients. Mean time to union in distal radius fractures was 10.3±2.4 weeks. Distal radial fractures united in all the patients but there was nonunion of ulnar styloid process fractures in 65% of patients in Group II. 35% of these patients had a persistent pain of varying degree on the ulnar side of wrist. DRUJ instability was noted in 20 % of patients in Group II and most of them were symptomatic while as only three patients had DRUJ instability in Group I and were asymptomatic. There were measurable differences in motion, strength, pain, or functional scores based on presence of styloid fracture in our study.

Tests of strength

In Group I all patients had normal grip strength except in 5 patients. Two of them had median nerve compression. While rest three had symptoms related to distal radioulnar joint. In Group II only 45 of the 60 patients had normal grip strength and endurance. Of the 15 patients 8 had very poor endurance of the grip, 4 had weakness of all the types of grip and 3 had weakness of one or more types of grip. The difference between the two groups was statistically significant (P value <0.05).

Activities of daily living

In Group I, 85 of the 90 patients had no difficulty whatsoever with either unilateral or bilateral activities of daily living. Two patients with median nerve compression had difficulty with all activities. Three more patients had difficulty in activities of daily living due to pain.

42 of the 60 patients in Group II had no difficulty with the activities of daily living. 15 had difficulty with one or two of the tests, mainly involving strength e.g., lifting a weight in a bucket. 3 patients had considerable difficulty with these tests. Again there was statistically significant difference between the two groups. (P value <0.05)

Range of movement

In Group I, 85 of the 90 patients had similar ranges of movement in both the wrists, with no more than 10 degrees difference in any measurement. Two patients with median nerve compression had lost 25 degrees of extension but other movements were normal. Three patients had symptoms related to distal radioulnar joint with arthritic changes.

In Group II, 50 of the 60 patients had normal ranges of movements in both the wrists. Five patients had restriction in pronation and supination of more than 20 degrees. Two patients had reduction between 20 to 30 degree in flexion/extension arc. Three patients had lost 15° to 30° loss of radial/ulnar deviation.

Pain

Two of the patients in group I complained of pain. In one it was graded as mild on the visual analogue scale and required no analgesia. The second patient with median nerve symptoms had moderate pain. 18 out of 60 patients in group II had their pain graded as mild to moderate and two patients had severe pain requiring regular analgesics. The difference in the incidence of pain between the two groups was statistically significant (P value <0.05).

Mean mayo score at final follow up in group I was 90 ± 5 and in group II was 80 ± 4 and the difference was statistically significant (P value <0.05).

DISCUSSION

Functional outcome of distal end radius fractures depends on many factors, the fracture of styloid process of ulna being one of them. Ulnar styloid fractures accompany 51% to 65% of distal radius fractures and represent important factor that may affect outcome. 7,10-12 However, there is a controversy regarding the management of ulnar styloid process in distal radius fractures and the concept is highly debated. In this study all patients with distal radius fracture with or without ulnar styloid fracture were managed conservatively and the functional status was compared and statistically evaluated. The patients without styloid process fracture did better functionally than those with involvement of styloid process. Because of its close association with the TFCC, fractures of the ulnar styloid might indicate possible TFCC disruption and resultant DRUJ instability. Oskarsson et al.⁷ in a case series of 158 fractures found great degree of loss of mobility and grip strength in patients with styloid process fracture treated none surgically and concluded that styloid process to be great predictor of fracture instability than articular involvement. Stoffelen et al.8 also found that presence of a styloid fracture was associated with worse outcome.

Distal radioulnar joint instability is a relatively uncommon and difficult complication to diagnose affecting a reported 3% to 37% of distal radius fractures. 1,4,8,13,14 High degree of suspicion is needed to diagnose DRUJ instability in distal radius fractures. Inability to diagnose them leads to worse wrist scores, worse subjective scores, and significantly more pain at rest and with loading at medium term evaluation. Distal radial fracture with DRUJ instability is also associated with ulnar-sided pain, painful limitation of forearm rotation, and a lower Cooney score. 8,15,16 DRUJ instability was noted in 20 % of patients in group II in our study and all of them had a styloid process fracture. May et al. 17 in his series of 130 distal radius fractures with and without ulnar styloid process fractures found that 14 of the patients with acute or chronic DRUJ instability had concomitant ulnar styloid process fractures. Although there is literature supporting both surgical as well as nonsurgical treatment of styloid process fracture, we believe the individual assessment of fracture is very important as all patients with styloid process fracture do not develop DRUJ instability.

Based on the results of our study we would like to consider volar plate fixation of distal radius fractures associated with ulnar styloid process fracture with intraoperative assessment of instability. If the joint is stable no further intervention is advisable but if joint is unstable we may need to fix it or use supination splinting if it keeps the joint reduced. However further studies need to done especially randomised trials and meta-analysis to reach to consensus in such a controversial subject.

CONCLUSION

We conclude that presence of an associated radial styloid fracture results in a weak and painful wrist in a significant number of patients and these fractures should be taken more seriously and managed effectively by open reduction and internal fixation of radial fracture. The decision to fix styloid process should be taken intraoperatively after assessment for distal radioulnar joint instability.

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REFERENCES

- Lindau T, Hagberg L, Adlercreutz C, Jonsson K, Aspenberg P. Distal radioulnar instability is an independent worsening factor in distal radius fractures. Clin Orthop. 2000;376:229-35.
- 2. Roysam GS. The distal radio-ulnar joint in Colles' fractures. J Bone Joint Surg. 1993;75B:58-60.
- Catalano LW III, Cole RJ, Gelberman RH, Evanoff BA, Gilula LA, Borrelli J Jr. Displaced intraarticular fractures of the distal aspect of the radius. Long-term results in young adults after open reduction and internal fixation. J Bone Joint Surg. 1997;79A:1290-302.
- 4. Lindau T, Adlercreutz C, Aspenberg P. Peripheral tears of the triangular fibrocartilage complex cause distal radioulnar joint instability after distal radial fractures. J Hand Surg. 2000;25A:464-8.
- 5. Stewart HD, Innes AR, Burke FD. Factors affecting the outcome of Colles' fracture: an anatomical and functional study. Injury. 1985;16:289-95.
- 6. Tsukazaki T, Iwasaki K. Ulnar wrist pain after Colles' fracture. Acta Orthop Scand. 1993;64:462-4.
- 7. Oskarsson GV, Aaser P, Hjall A. Do we underestimate the predictive value of the ulnar styloid affection in Colle's fractures? Arch Orthop Trauma Surg. 1997;116:341-4.
- 8. Stoffelen D, de Smet L, Broos P. The importance of the distal radioulnar joint in distal radial fractures. J Hand Surg. 1998;23B:507-11.
- Kaukonen J-P, Karaharju EO, Porras M, Ltithje P, Jakobsson A. Functional recovery after fractures of the distal forearm. Analysis of radiographic and other factors affecting the outcome. Ann Chir Gynaecol. 1988;77:27-31.
- Richards RS, Bennett JD, Roth JH, Milne K. Arthroscopic diagnosis of intra-articular soft tissue injuries associated with distal radial fractures. J Hand Surg. 1997;22A:772-6.
- 11. Villar RN, Marsh D, Rushton N, Greatorex RA. Three years after Colles' fracture: a prospective review. J Bone Joint Surg. 1987;69B:635-8.

- 12. Lindau T, Arner M, Hagberg L. Intraarticular lesions in distal fractures of the radius in young adults. J Hand Surg. 1997;22B:638-43.
- 13. Frykman G. Fracture of the distal radius including sequelae--shoulder-hand-finger syndrome, disturbance in the distal radio-ulnar joint and impairment of nerve function. A clinical and experimental study. Acta Orthop Scand. 1967;108(Suppl):1-124.
- 14. Solgaard S. Function after distal radius fracture. Acta Orthop Scand. 1988;59:39-42.
- 15. Melone CP, Nathan R. Traumatic disruption of the triangular fibrocartilage complex. Clin Orthop. 1992;275:65-73.
- 16. Morrissy RT, Nalebuff EA. Dislocation of the distal radioulnar joint: anatomy and clues to prompt diagnosis. Clin Orthop. 1979;144:154-8.
- 17. May MM, Lawton JN, Blazar PE. Ulnar styloid fractures associated with distal radius fractures: incidence and implications for distal radioulnar joint instability. J Hand Surg. 2002;27A:965-71.

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