

A CASE SERIES ON GALEAZZI-VARIANT TYPE FRACTURE- DISLOCATION IN ADULTS

Case Report Orthopaedics

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Article submitted on: 08 April 2018

Article Accepted on: 08 April 2018

Abstract:

Background: Galeazzi variant type fracture dislocation i.e. Fracture of radius and ulna with dislocation at distal radioulnar joint (DRUJ) is uncommon injury and injury pattern is inherently unstable needs surgical management invariably. Here we are presenting a case series of such patients, their management, analysis of injury pattern and functional assessment.

Methods: This study is a case series of 10 patients who presented with closed fracture of both bone forearms associated with dislocation of DRUJ without distal neurovascular deficit. Patients were managed operatively. The radial and ulnar fractures were treated with open reduction and internal fixation by means of a 3.5 mm small dynamic compression plate (DCP). Patients were given above elbow slab for 4 weeks, followed by physiotherapy and range of movement exercises. Radiographs were taken at 4 weeks, 8 weeks, 12 weeks, 6 months and 1 year. Pt was evaluated clinically and radiologically for fracture union and DRUJ stability.

Results: All the patients were followed up for 1 year. The maximum Incidence of such injuries occurred in 4th decade of life (age between 31 to 40 years). Average time of fracture union in our study was 13 weeks. No restriction of Range of movement at wrist, elbow, Supination and pronation. DRUJ was stable in all the cases.

Conclusion: Galeazzi variant type fracture dislocation in adults is not a

very common injury in routine orthopaedic practice. Open reduction and internal fixation of both-bone forearm fractures is essential and reduction of DRUJ was spontaneous thus can be managed conservatively, in form 4 weeks of immobilization in a above elbow POP slab (healing of disrupted DRUJ), after that physiotherapy and range of movement exercises showed good results.

Keywords: Galeazzi variant, both bone forearm fractures, distal radio ulnar joint (DRUJ).

Introduction

Galeazzi Fracture-dislocation is a fracture of the middle or distal shaft of radius and dislocation of the distal ulna at the distal radioulnar joint (DRUJ). This pattern of injury was first described by Cooper¹ in 1824. Galeazzi reported a series of 18 cases of this injury and its management. The Galeazzi fracture has been described as a fracture requiring operative treatment and account for 6.8% of all forearm fractures in adults². Here we are presenting a different entity called Galeazzi-variant type Fracture-dislocation, as shaft of both forearm bones were fractured and DRUJ was dislocated, inherently unstable injury pattern required surgical management.

Material And Methods

This study is a case series of 10 patients who presented with closed fracture of both bone forearm associated with dislocation of DRUJ without distal neurovascular deficit, confirmed by Anteroposterior (AP) and lateral X-rays of the forearm with wrist.

Initially above elbow pop slab was given and routine investigations for pre anaesthetic fitness were done and patients were managed operatively. The radial and ulnar fractures were treated with open reduction and internal fixation by means of a 3.5 mm dynamic compression plate (DCP). After fixation of forearm fractures, we noticed that the DRUJ also reduced spontaneously and no additional fixation was required. This was confirmed by both intra operative image intensifier and postoperative X-rays.

We also found that the DRUJ was stable, were given above elbow POP slab for 4 weeks, followed by physiotherapy and range of movement

exercises. Patients were followed up and radiographs were taken at 4 weeks, 8 weeks, 12 weeks, 6 months and 1 year. Pt was evaluated clinically and radiologically for fracture union and DRUJ stability.

Results

The patients in our study having age 25 to 49 years, peak incidence in 4th decade of life (6 patients in 31-40 age group), 60% patients were male (6 patients), cause of fracture-dislocation was motor vehicle accident in 70% patients (7 patients), pattern of fractures was short oblique in 50% patients (5 patients). Fracture of both radius and ulna were united within 14 weeks in 60% patients (6 patients) and average fracture union time was 13 weeks. There were no reported subsequent subluxations or dislocations of the DRUJ in any of our case. The grip strength of both hands were comparable, more than 45 degrees palmar flexion and dorsiflexion was there in all the cases. Supination and pronation of functional range was noted as early as 12 weeks.

Figure 1. Preoperative AP and lateral X-rays showing both-bone forearm fractures with dislocation of DRUJ.



Figure 2. Postoperative AP and lateral X-rays showing stable fixation of fractures with DCP and reduction of dislocated DRUJ.



Table 1. Patients related demographic characteristics.

| Variables | No. of cases |
|-------------------------------|--------------|
| Age group (years) | |
| 20-30 | 2 |
| 31-40 | 6 |
| 41-50 | 2 |
| Sex | |
| Male | 6 |
| Female | 4 |
| Mode of injury | |
| Motor vehicle accidents (MVA) | 7 |
| Fall from height | 3 |
| Pattern of fractures | |
| Transverse | 3 |
| Short oblique | 5 |
| Comminuted | 2 |
| Union (weeks) | |
| Within 10 | 3 |
| Within 14 | 6 |
| Within 16 | 1 |

Discussion

Galeazzi fracture-dislocation is characterized by its inherently unstable injury pattern. A high index of suspicion should be maintained by the treating surgeon and a thorough examination for instability of the DRUJ must be conducted³. However, here we are describing the injury pattern (Galeazzi variant type fracture-dislocation) which is more complex, even rarer and seems more unstable.

Although Galeazzi fracture-dislocation historically has been considered combination of distal radial shaft fracture and DRUJ dislocation, yet other associated injuries have been described in the literature.

Soon et al⁴ described a case of persistent radial head subluxation associated with an ipsilateral radial shaft fracture. The subluxation, missed after the initial injury, was not diagnosed until seven weeks later.

Malik et al⁵ described two cases

of acute elbow dislocation with radial neck fracture and traumatic DRUJ dislocation.

Shiboi et al⁶ reported an unusual case of a posterolateral elbow dislocation with an ipsilateral Galeazzi fracture.

In the management of Galeazzi fracture, it is important to obtain an anatomical reduction of the DRUJ at the time of fixation of the radius, because persistent subluxation and instability are the most frequent causes of poor outcomes. In the present case series, after the radius and ulna were adequately fixed with DCP, the DRUJ then became stable spontaneously and did not require any additional fixation. Only temporary immobilization in above elbow POP slab was adequate for the healing of DRUJ, as we did not encounter any residual or recurrent subluxation of DRUJ in our study.

Two principal mechanisms of injury in Galeazzi fracture have been reported⁷. Hughston⁸ has proposed that Galeazzi fracture is usually caused by a direct blow to the dorsolateral aspect of the forearm. On the other hand, Mikic⁹ has proposed that the most probable mechanism is a fall on the outstretched hand combined with extreme pronation of the forearm. He has related that the forces across the radio carpal joint, producing the dislocation at DRUJ and subsequent fracture of the radial shaft. He has also noted that as the displacement continues, dislocation of the ulnar head occurs with tearing of the triangular fibrocartilage, which then loses its stabilizing influence on the wrist.

Our cases present as a Galeazzi-variant type fracture. From the pathological and therapeutic point of view these injury differ from ordinary fractures of the forearm. Stable open reduction and internal fixation of

fractures of both forearm bones is mandatory, followed by 4 weeks of immobilization in an above elbow POP slab for the healing of disrupted DRUJ. The mechanism of injury is the same as in the classic type of Galeazzi fracture-dislocation. The extreme axial loading from the impact of an outstretched hand with a fully extended elbow and a pronated forearm with the weight of the patient's body acting as a driving force, could result in a Galeazzi fracture. The fracture of ulna which obviously occurs after the dislocation of radioulnar joint, as force continues to be applied, is the unique features of the injury that might be considered differentiating characteristics from typical Galeazzi fracture-dislocation. Because of the rupture of the triangular fibro cartilage complex (TFCC), this Galeazzi-variant type fracture-dislocation is also extremely unstable.⁹

A complete dislocation of the DRUJ always involves rupture of the articular disc and of the associated dorsal and volar distal radioulnar ligaments. This articular injury, as well as the fracture of the radius and ulna must be dealt with, if good results are to be obtained.¹⁰

Conclusion

Galeazzi variant type fracture dislocation in adults is not a very common injury in routine orthopaedic practice. Open reduction and internal fixation of both-bone forearm fractures is essential and reduction of DRUJ was spontaneous thus can be managed conservatively, in form of 4 weeks of immobilization in a above elbow POP slab (healing of disrupted DRUJ), after that physiotherapy and range of movement exercises showed good results.

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