

Bilateral combined Monteggia and Galeazzi fractures: a case report

Davod Jafari¹, Hamid Taheri², Hooman Shariatzade³
Farid Najd Mazhar⁴, Alireza Jalili⁵, Mohamad H Ghahramani⁶

Department of Hand Surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran.

Received: 1 January 2012

Revised: 14 February 2012

Accepted: 18 February 2012

Abstract

We present an exceedingly rare case of left Monteggia-Galeazzi fracture-dislocation and right Monteggia-distal radius fracture occurring simultaneously in a 20-year old male patient who had fallen 13 meters from a building. The combination of Monteggia and Galeazzi fracture-dislocation in the same forearm is very rare and, to the best of our knowledge, simultaneous bilateral Monteggia and Galeazzi or distal radius fracture in the same patient, have never been reported.

Keywords: forearm fracture-dislocation, Galeazzi, Monteggia

Introduction

Monteggia and Galeazzi fracture-dislocations are unstable forearm injuries and represent 1%-2% and 3%-4% of forearm fractures, respectively (1,2).

The reported mechanism of injury for Monteggia lesions in children is a fall on outstretched hand in pronated position. In adults, ulnar fractures always display either a transverse comminuted fracture or a fracture with butterfly fragment, both of which suggest a direct blow or bending force rather than torsion, and the mechanism of injury in children.

The mechanism causing a Galeazzi injury

is generally believed to be a fall on outstretched hand with hyperpronation (2).

Case report

A 20 - year old college student who fell from a height of 13 meters (the 4th floor of a building) was brought to our hospital a few hours after trauma. He presented with bilateral open forearm fractures (exposed ulnar bone), swollen and deformed elbows and wrists, deformity of left arm and thigh. He presented radial nerve palsy on the left side and scalp laceration. Vital signs and central nervous system were normal.

Radiographic examination (Fig. 1) revealed bilateral ulnar fractures at the junc-

1. Associated professor, Chairman of Department of Hand Surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran. djafari@tums.ac.ir

2. Associated professor, Department of Hand Surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran. taheri-ham@yahoo.com

3. Assistant professor, Department of hand surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran. shariatzade-h@hotmail.com

4. Assistant professor, Department of Hand Surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran. fnajdmazhar@yahoo.com

5. **(Corresponding author)** Assistant professor, Department of Hand surgery, Shahid Mohammadi Hospital, Hormozgan University of Medical Sciences, Bandar Abbas, Iran. alirezajalili.jalili@gmail.com

6. Assistant professor, Department of Hand Surgery, Shafa Hospital, Tehran University of Medical Sciences, Tehran, Iran. mhqahremani@yahoo.com



Fig.1. X-ray of bilateral elbow, forearm and wrist.



Fig. 2. A: Right forearm after reduction of distal radius fracture, radial head dislocation and open ulnar fracture, B: Left forearm after percutaneous pinning of distal radioulnar joint.



Fig. 3. X-ray of bilateral elbow, forearm and wrist, six months after initial injuries.

tion of the proximal and middle third, bilateral posterior dislocation of the radial head

(Bado type III), bilateral distal radius fractures and left distal radioulnar joint dis-

location in addition to left femoral and left humeral shaft fracture.

Both ulnar open fractures were treated with debridement and intramedullary pin fixation. Closed reduction was performed on both radial heads. The left Galeazzi fracture dislocation reduced and the distal radius fracture was pinned percutaneously (Fig. 2 B). After closed reduction of the right distal radius fracture, percutaneous pin was inserted (Fig. 2A).

Bilateral long arm splint was applied. Three days after the trauma when the patient's general health had stabilized, open reduction of the humerus fracture with radial nerve exploration was performed. The radial lacerated nerve at the level of the fracture was repaired with open reduction of the femoral fracture.

When the forearm splints were removed after 4 weeks, the left distal radio ulnar joint (DRUJ) seemed unstable and dislocated by forearm supination. Consequently a closed reduction of the DRUJ was performed in the operating room and the ulna pinned to the radius (the pins were removed 6 weeks later). Twelve weeks after the primary trauma the ulnar fracture in the left forearm did not progress to union as well as that of the right side, Thus plating and bone grafting were performed on the left side.

Six months after the trauma the healing of the fractures was completed and the patient recovered his wrist extension power (Fig. 2). The patient returned to work 9 months after the accident. At the time of the last visit 18 months after trauma, the elbow, forearm, and wrist motion were all evaluated (Table 1).

Left wrist extension, MP extension of the fingers, thumb extension and abduction power were in a good condition (4/5).

Discussion

According to Bado (3), Monteggia lesion includes radiohumeral dislocation associated with fracture of the ulna at any level. Galeazzi fracture is fracture of the distal radial shaft with DRUJ dislocation.

Ten cases of combined Monteggia and Galeazzi fracture have been reported (8 adults and 2 childrens) (4,5,6,13).

There are few reports of combined Monteggia with distal radius fracture.

To the best of our knowledge the occurrence of combined Monteggia-Galeazzi fracture on one side and Monteggia-distal radius fracture on the other side in the same patient have never been reported. Because of rare occurrence of this injury and presence of multiple fractures and dislocations there is possibility of pitfalls in the operative treatment of these cases (13).

Falling down on outstretched hand with pronation of left side could cause distal radius fracture, DRUJ dislocation, radial head dislocation, ulnar open fracture, humerus fracture and radial nerve laceration at arm fracture site.

Moore et al believe that the exact clinical and radiological criteria for Galeazzi fractures have not yet been clearly established (7). They list 4 reliable radiographic signs of DRUJ disruption as: basal fracture of ulnar styloid; widening of joint space of the DRUJ as shown on anteroposterior x-ray; dislocation of the radius relative to the ulna as shown on a lateral x-ray; and a shortening of the radius of more than 5 millimeters.

In our patient, lateral x-ray of the left wrist, demonstrated dislocation of the ulnar head relative to the radius. Because of the instability of the left DRUJ even after 4 weeks immobilization in splint, we stabilized this joint with percutaneous radioulnar pinning. After 6 weeks pins were removed and joint showed stable.

Galeazzi fracture cannot be controlled with closed treatment because of the deforming force of the brachioradialis, pronator quadratus, thumb extensor and abductors described by Hughston (8).

The hand acts as a volar deforming force on the distal fragment. The brachioradialis shortens the fragment on the ulna and pronator quadratus also pulls the distal fragment volar and proximal to the ulna. Moreover the thumb abductors can contribute to further shortening of the radial side of the

Table 1. Elbow, wrist and forearm range of motion 18 months after trauma.

	Left	right
Elbow Rom	10 - 130	0 - 130
Forearm pronation	80	80
Forearm supination	75	75
Wrist flexion	60	70
Wrist extension	65	65

wrist.

Anatomic restoration of the length and alignment to the radius is essential in the management of these injuries (2,8-10). Reduction and stability of the DRUJ are then assessed with forearm rotation; if the reduction is stable the forearm can be immobilized in supination for 4 to 6 weeks (11,12). If, after reduction, the DRUJ is unstable, stabilization of the joint seems necessary. This can be usually performed using open reduction and internal fixation or percutaneous pinning of DRUJ or with ulnar styloid fragment.

Acknowledgments

We thank Dick Edelstein (author aid in the Eastern Mediterranean) for improving the use of English in the manuscript.

References

1. Clare D j, Corley F G, Wirth M A. Ipsilateral Combination Monteggia and Galeazzi injuries in an adult patient: a case report. *Journal of orthopedic trauma* 2002; 16(2):130-134.
2. Mikiki Z.D.J. Galeazzi fracture dislocation. *J Bone Joint Surg Am* 1975; 57: 1071-1080.
3. Bado JL. The Monteggia Lesion. *Clin Orthop* 1967; 50: 71-86.
4. Nihar R P, poonam P. Ipsilateral Combined Monteggia and Galeazzi Injuries presenting late: A case report. *Injury Extra* 2005 ;36 (10): 458-462.
5. Maeda H Y, Doi, R, Omori O. Combined Monteggia and Galeazzi Fractures in a child: a case report and review of the literature. *Journal of Orthopaedic Trauma* 2003; 17 (2): 128-131.
6. Boopalan PRJVC, Titus VTK, Thilak. Ipsilateral Galeazzi and Monteggia fracture. *Injury Extra* 2007; 38(9): 308-311.
7. Moore T M, Klein J P, Patzakis M J, and Harvey J P. results of compression plating of closed Galeazzi fractures. *J bone Joint Surg Am* 1985; 67: 10-15.
8. Hughston JC. Fracture of the distal radial shaft.

J Bone Joint Surg Am 1957; 39: 249-264.

9. Diaphyseal fracture of the forearm. In: Browner BD, Jupiter JB, Levin AM, et al. eds. Skeletal trauma. Philadelphia, PA: W.B. Saunders, 2011. pp. 123-230.

10. Reckling FW. Unstable fracture - dislocation of the forearm. J Bone Joint Surg Am 1982; 64: 857-863.

11. Fractures of the shaft of the radius and ulna. In Richards RR, Corley FG. Rockwood and Greens,

Fractures in adults. Philadelphia, PA Lippincott – Raven, 2011.

12. Fractures of the radius and ulna .Tie M. In: Schatzger J Tile M, eds. The Rationle of Operative Fracture care. NY: Springer-Verlag, 2010.

13. Letta C, Schmied M, Haller A, Rindlisbacher A. Combined Monteggia and Galeazzi lesions of the forearm: A rare injury. Unfallchirurg 2011; 11 [Epub ahead of print].