Internal fixation in 50 cases of Galeazzi fracture

Krishan Mohan, Anil Kumar Gupta, Jagmohan Sharma, A. K. Singh and A. K. Jain

Fifty Galeazzi fracture dislocations were treated by early open reduction, internal fixation, and cancellous bone grafting. After 1 year, 40 cases were good, 8 fair, and 2 poor. We conclude that early open reduction and rigid internal fixation reestablishes the normal relationship of the fractured fragments and the distal radioulnar joint without repair of the ligaments.

Radius fracture with dislocation of the distal radioulnar joint was described already in 1824 by Sir Astley Cooper, but the eponym honors Riccardo Galeazzi, who described 18 cases in 1934. Galeazzi fracture dislocation is inherently unstable. Hughston (1957) studied the biomechanics of the injury and reported a 92 percent failure rate in patients treated closed, later confirmed by Reckling and Peltier (1965), Wong (1967), Reckling and Cordell (1968), and Mikic (1975). Harnley (1961) advised internal fixation in all cases except in elderly patients.

We have reviewed our results of internal fixation with a plate and screws or a square nail combined with bone grafts.

Patients and methods

Fifty patients with Galeazzi fracture dislocations were treated at our department from 1980 through 1984. Their mean age was 30 (10–60) years. Most fractures occurred at the junction of the middle and distal third of the shaft of the radius (Table 1); 30 fractures were transverse, 15 oblique, and the remaining five had comminution. One fracture was open; reduction was undertaken after the wound had healed.

Central Institute of Orthopedics, University College of Medical Sciences, Safdarjang Hospital, New Delhi, 110 029 India

Correspondence: Dr. Krishan Mohan, 16/3, East Patel Nagar, New Delhi-110 008, India

Three cases were primarily treated with closed reduction and plaster immobilization in complete supination (Figure 1). Radiographic examination at 2 weeks revealed redisplacement of the fragments and internal fixation was performed. Square nails were used for internal fixation of 20 fractures, whereas fixation with a semitubular plate was done in 30 fractures (Figure 2). A square nail was preferred in eight proximal fractures, five fractures with comminution, and seven long oblique fractures. Primary cancellous bone grafting was done in all the cases. The ligaments of the distal radioulnar joint were not repaired in any case. External support was continued for 6–10 weeks. The follow-up time was 1 (1–1.5) year.

Results

Good results were obtained in 40 cases, fair in 8, and poor in 2 (Tables 2 and 3). Totally, 29/30 distal

Table 1. Galeazzi fracture dislocations. Site of fracture and associated injuries of distal radioulnar joint

Fracture site	n	Associated injuries of distal radioulnar joint		
		Dislocation	Subluxation	Fractured ulnar styloid process only
Upper third	3	1	1	1
Middle third	5	2	–	3
Junction of middle and lower third	40	16	4	10
Lower third	2	1	–	1
	50	20	5	15

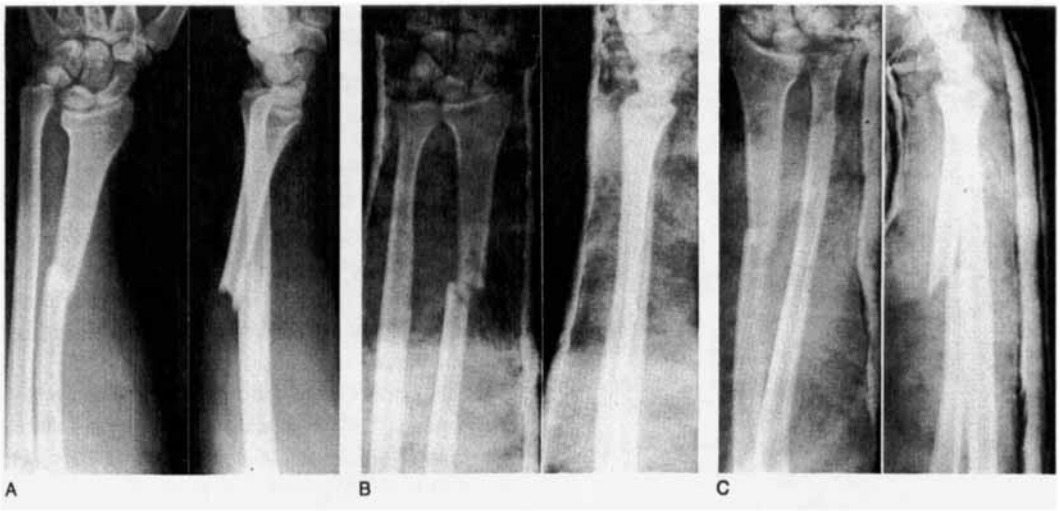

Figure 1. Galeazzi fracture dislocation.
A. At presentation.
B. After successful closed reduction.
C. Redisplacement after 2 weeks.

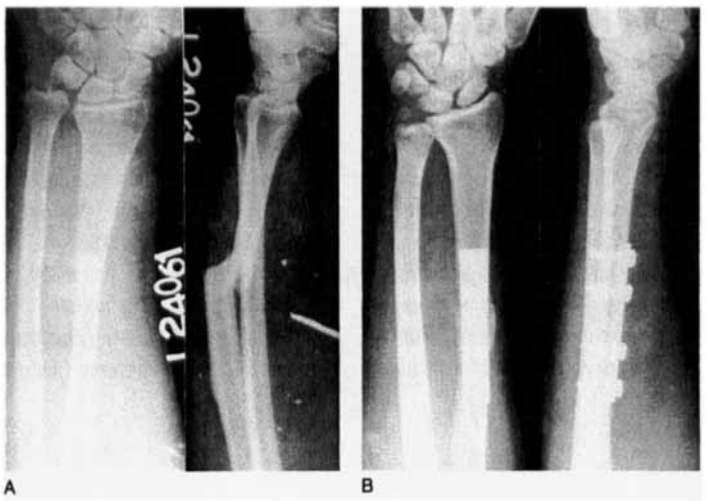

Figure 2. Galeazzi fracture dislocation.
A. At presentation.
B. United fracture and normal distal radioulnar joint 8 weeks after semitubular plating and bone grafting.

Table 2. Criteria for assessment of outcome

	Good	Fair	Poor
Union	< 10 weeks	Delayed	Nonunion
Supination/ pronation	Normal	Restricted < 45°	Restricted > 45°
Distal radio-ulnar joint	Normal	Subluxated	Dislocated

Table 3. Outcome in 50 patients with Galeazzi fracture dislocation

Location of	Fracture site	Osteosynthesis		Good	Fair	Poor
Upper third	3	Nailing		3	–	–
Middle third	5	Nailing		5	–	–
Junction of	40	Nailing	11	4	7	–
middle and		Plating	29	28	–	1[a]
lower third	2	Nailing		–	1	1
Lower third		Plating		–	1	
	50		50	40	8	2

[a] Deep infection.

Galeazzi fractures fixed with semitubular plates united in less than 10 weeks, whereas only 4/12 cases with square nail fixation united within 10 weeks. Eight proximal Galeazzi fractures with square nail fixation united in less than 10 weeks ($P < 0.02$). Thus, fracture dislocations of the distal third of the radius showed better results when treated with plate and screws than with a square nail.

Infection was the most frequent complication. Superficial wound infection was noticed in 5 cases and deep infection in 1 case of plate and screw fixation. There was no difference in clinical outcome of patients with fracture of the ulnar styloid process even though this fracture remained ununited. Excision of the head of the ulna was eventually performed in 2 cases with severe limitation of supination and pronation.

Figure 3. Galeazzi fracture dislocation treated by intramedullary nailing. After 4 months' delayed union with distal migration of the nail.

Discussion

The Galeazzi fracture dislocation is an inherently unstable fracture. The brachioradialis muscle and the extensors and abductors of the thumb tend to shorten the radius while the pronator quadratus rotates the distal fragment towards the ulna (Reckling 1982). Disruption of the radioulnar joint increases the instability of the fracture; a disturbance of radial length in the presence of an intact ulna must lead to incongruity of this joint. Reckling and Cordell (1968) and Mikic (1975) described the anatomic feature of the distal radioulnar joint and observed that rupture of the articular fibrocartilage disc is seen in association with the disruption of the joint. Mikic (1975) and Kraus and Horne (1985) claimed that avulsion of the ulnar styloid process is equivalent to fibrocartilage disc rupture and reported that fractures of the ulnar styloid process in 60 percent resulted in nonunion of the styloid process, but that function was not impaired.

After restoration of the length of the radius by early open reduction, ligament repair of the distal radioulnar joint or fixation of the ulnar styloid process is not required. Traumatic dislocation of the distal radioulnar joint can be treated nonoperatively with 1 month of plaster immobilization, and good results are usually achieved (Dameron 1972).

Internal fixation by square nail in Galeazzi fracture of the distal third of the radius is unsuitable because the medullary canal there is wide. This not only permits rotatory motion at the fracture site, but also substantial ad latus movement, which may predispose to delayed union (Figure 3). Hence, we conclude that plate and screw fixation is superior to square nail fixation in these fractures.

References

Campbell W C. Campbell's operative orthopaedics. 6th ed. C.V. Mosby Co, St Louis, Toronto, London 1980; 1:697–700.

Charnley J. The closed treatment of commnon fractures. 3rd ed. Churchill Livingstone, Edinburgh 1961:126–7.

Cooper A. Simple fracture of the radius and dislocation of the ulna. In: A Treatise on Dislocations and on Fractures of the Joints. 4th ed. Longman and Underwood, London 1824:470–6.

Dameron T B Jr. Traumatic dislocation of the distal radio-ulnar joint. Clin Orthop 1972;83:55–63.

Galeazzi R. Di una particolare sindrome traumatica dello scheleto dell'avambraccio. Atti Mem Soc Lombardi Chir 1934;2:12.

Hughston J C. Fracture of the distal radial shaft. Mistakes in management. J Bone Joint Surg (Am) 1957;39:249–64.

Kraus B, Horne G. Galeazzi fractures. J Trauma 1985; 25(11):1093–5.

Mikic Z D. Galeazzi fracture dislocations. J Bone Joint Surg (Am) 1975;57(8):1071–80.

Reckling F W. Unstable fracture dislocations of the forearm(Monteggia and Galeazzi lesions). J Bone Joint Surg (Am) 1982;64(6):857–63.

Reckling F W, Cordell L D. Unstable fracture dislocations of the forearm. The Monteggia and Galeazzi lesions. Arch Surg 1968;96(6):999–1007.

Reckling F W, Peltier L F. Riccardo Galeazzi and Galeazzi's fracture. Surgery 1965;58:453–9.

Sage F P. Medullary fixation of fractures of the forearm: A study of the medullary canal of the radius and a report of fifty fractures of the radius treated with prebent triangular nail. J Bone Joint Surg (Am) 1959; 41:1489.

Wong P C. Galeazzi fracture dislocations in Singapore 1960–64; incidence and results of treatment. Singapore Med J 1967;8(3):186–93.