

· · · · ·

< >

: 14 6

: 1991 3 2000 3 Poly-glycolic acid(PGA) 14 Mason 가

가 II 1~2

: 1 5 20 130

가 2 6 , 3

, 2 , 1

: PGA

: , , ,

가

, 가

가

가 K-

, 가 ,

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* 2001

가 2 , 가 , 가
가 1 5 (1 4 11)
20 (10 -40) ,
130 (90 -140),
가 4-5% ,
71 (45 -90), 57 (30 -75)
가 가
8 6
가 ,
2 , 3 , 3 ,
가 62.5% ,
가 3 , 3 50%
6 , 3
3 2
3 1
3 1
2
2 1
1
1991 3 2000 3 poly-glycolic acid
14
가 10 , 가 4 ,
16 , 69 44.6
가 11 , 가 3
4 ,
2 ,
1 , 가 1
가 IV 가
Mason¹²⁾ II 4 , III 10
, Hotchkiss¹⁰⁾ Mason 가
가 II .
가 가
가 1 1.5mm
2mm
90
1-2
(proximal migration)
가
가 29-11,13,14)
Broberg Morrey⁸⁾ 가
가 K- , ,
가 ,
가 ,

100 “ ” , 1,3-5,7) 10,11,14) , , 가 T- 29-11,13,14) 3,6,7,16) 가 , 2 가 Bostman Pihlajamaki⁷⁾ 가 , 가 2,3,7) 가 7) 1980 , 가 1,2,7) Poly-glycolic acid(PGA), Poly-lactic acid(PLA), PGA/PLA copolymer, Poly-p-dioxanone, Polyglycolide-co-trimethylene-carbonate (self-reinforced) 가 PGA 2 20% , 4 ~ 6 80% . Poly-p-dioxanone 6 49% , 6 2528 34 , PLA 12 90%, 50% , 가 6 2,3,15) PGA 5.3% 20 2.0~46.7% . PLA 1 (0.2%) 4.3 14 , 47.4% Bostman Pihlajamaki⁷⁾ PGA가 PLA 가 (sinus) 6 PLA 가

PGA
42.9%
가
PGA
가
(42.9%)

REFERENCES

- 1) **Ashammakhi N and Rokkanen P** : Absorbable polyglycolide devices in trauma and bone surgery. *Biomaterials*. 18:3-9, 1997.
- 2) **Back GH, Sohn YJ, Lee CK and Chung MS** : Bioresorbable implant fixation for the treatment of radial head and neck fractures. *J of the Korean Society of Fracture*. 11:70-77, 1998.
- 3) **Bostman OM** : Current concepts review. Absorbable implants for the fixation of fractures. *J Bone Joint Surg*. 73-A:148-152, 1991.
- 4) **Bostman OM** : Osteoarthritis of the ankle after foreign-body reaction to absorbable pins and screws. A three- to nine-year follow-up study. *J Bone Joint Surg*. 80-B:333-338, 1998.
- 5) **Bostman OM** : Osteolytic changes accompanying degradation of absorbable fracture fixation implants. *J Bone Joint Surg*. 73-B:679-682, 1991.
- 6) **Bostman OM, Partio E, Hirvensalo E and Rokkanen P** : Foreign-body reactions to polyglycolide screws. Observations in 24/216 malleolar fracture cases. *Acta Orthop Scand*. 63:173-176, 1992.
- 7) **Bostman OM and Pihlajamaki HK** : Adverse tissue reactions to bioabsorbable fixation devices. *Clin Orthop*. 371:216-227, 2000.
- 8) **Broberg MA and Morrey BF** : Results of delayed excision of the radial head after fracture. *J Bone Joint Surg*. 68-A:669-674, 1986.
- 9) **Hirvensalo E, Bostman O and Rokkanen P** : Absorbable polyglycolide pins in fixation of displaced fractures of the radial head. *Arch Orthop Trauma Surg*. 109:258-261, 1990.
- 10) **Hotchkiss RN** : Displaced fractures of the radial head: internal fixation or excision? *J Am Acad Orthop Surg*. 5:1-10, 1997.
- 11) **Kang HJ, Park MS, Shin SJ, Kang ES and BM Park** : Operative treatment of radial head fractures of Mason type III. *J of the Korean Society of Fracture*. 12:732-740, 1999.
- 12) **Mason ML** : Some observation on the fracture of the radius. *J Bone Joint Surg*. 42-A:123-132, 1954.
- 13) **McKee MD and Jupiter JB** : Radial head fractures. In : Browner BD, Jupiter JB, Levine AM and Trafton PG ed. *Skeletal trauma*. 2nd ed. Philadelphia, W.B. Saunders Co.:1456-1464, 1998.
- 14) **Mezera K and Hotchkiss RN** : Radial head fractures. In : Bucholz RW and Heckman JD ed. *Rockwood and Green's fractures in adults*. 5th ed. Philadelphia, Lippincott Williams & Wilkins:940-951, 2001.
- 15) **Rokkanen P, Majola A, Vasenius J, et al** : Strength retention of self-reinforced polyglycolic and SR-poly(lactic acid)(SR-PLA) composite rods in vitro and in vivo. *Acta Orthop Scand*. 235(Suppl):S17, 1990.
- 16) **Santabirta S, Konttinen YT, Saito T, et al** : Immune response to polyglycolic acid implant. *J Bone Joint Surg*. 72-B:597-600, 1990.

Table 1. Summary of Fracture Type, Associated injuries, and Results

No.	Sex/Age	Trauma	Site	Associated OS Injury	Op name	Result	Complication	Treatment
1	M/56	Driver TA	Rt	Fx distal radius	2 AR	Fair	No	
2	M/40	Slipped down	Lt	No	1 AR	Good	Arthritis	Arthroscopic debridement
3	M/33	Fall down	Lt	Fx coronoid process	1 AR+2 screw	Excellent	No	
4	M/16	Fall down	Lt	Fx coronoid process	3 AR	Good	No	
5	F/52	Pedestrian TA	Lt	No	2 AR	Fair	No	
6	M/52	Slipped down	Rt	Fx distal radius, shaft of ulna	4 AR	Good	No	
7	M/69	Pedestrian TA	Rt	Fx coronoid process	2 AR+1 Herbert	Fair	No	
8	M/35	Slipped down	Lt	No	3 AR	Good	No	
9	M/48	Slipped down	Lt	Fx coronoid process	2 AR	Fair	Osteolysis	Excision of radial head
10	F/50	Slipped down	Rt	No	3 AR	Fair	Osteolysis	Excision of radial head
11	F/53	Fall down	Lt	No	1 AR	Good	Arthritis	Transfer of ulnar nerve
12	F/46	Fall down	Rt	Rupture of MCL	3 AR	Fair	Osteolysis	Observation
13	M/28	Slipped down	Rt	Bilateral radial head fracture	5 AR	Good	Synovitis	Observation
14	F/22	Fall down	Lt	Bilateral radial head fracture	3 AR	Excellent	No	

* AR = Absorbable Rod

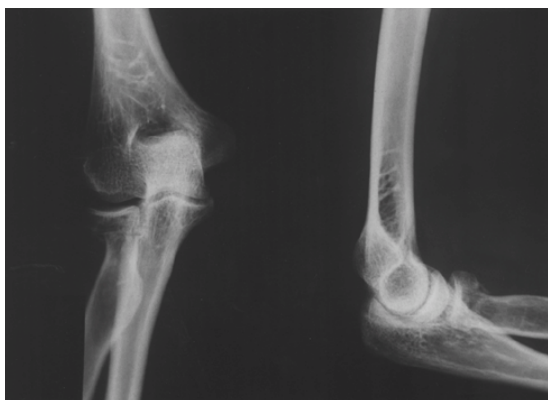


Fig. 1 : Preoperative plain anteroposterior and lateral radiographs of a 50 year old female shows the finding of a fracture of radius neck in the right elbow.

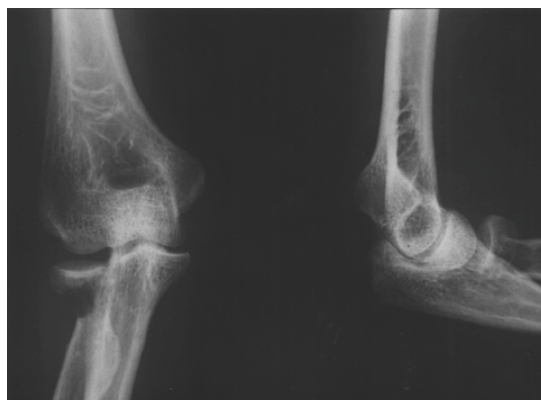


Fig. 2 : Postoperative 2 month plain anteroposterior and lateral radiographs shows the finding of osteolysis of the radius neck.

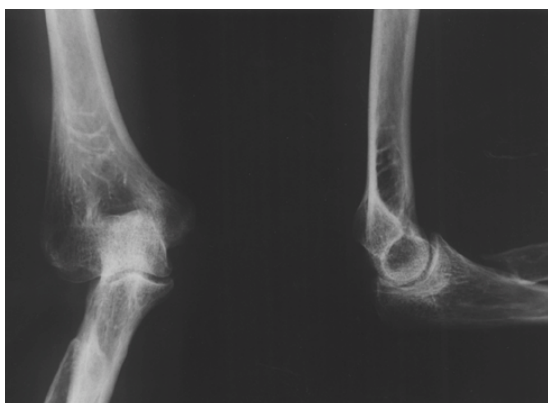


Fig. 3 : Plain anteroposterior and lateral radiographs shows radial head resection state

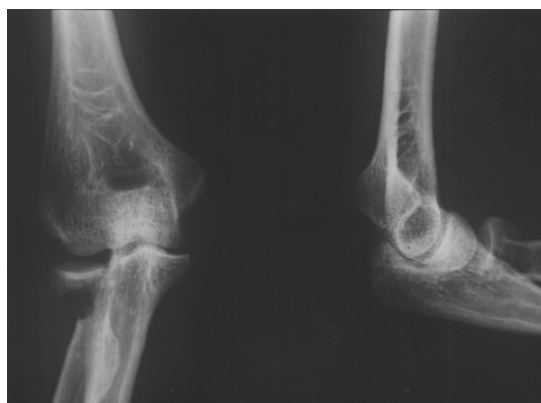


Fig. 4 : Histologic section shows non-specific inflammatory reaction. There are multinucleated giant cells(black arrow), lymphocytes, fibroblasts and foreign body(white arrow)(H-E stain 100).

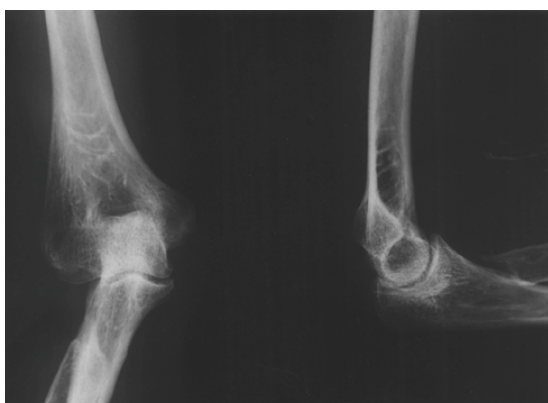


Fig. 5 : Preoperative plain anteroposterior and lateral radiographs of a 53 year old female shows the finding of a fracture of radius head in the left elbow.

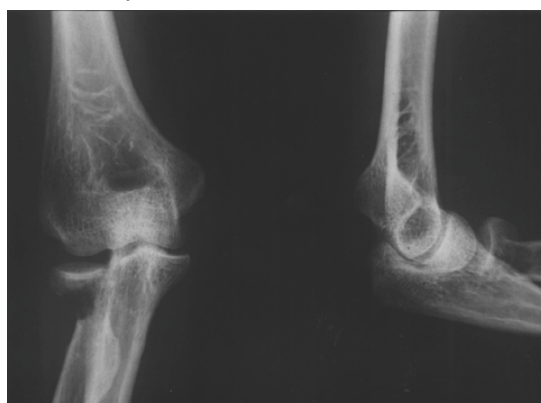


Fig. 6 : Postoperative 6 months plain anteroposterior and lateral radiographs shows the finding of osteoarthritic change of radiohumeral, ulnohumeral and proximal radioulnar joints.

Abstract

Adverse Effect of the Absorbable Rods in Treatment of the Radial Head & Neck Fractures

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Purpose : We report complications occurred from 6 patients among 14 patients who received the operation for their radial head and neck fractures by using the absorbable rod made by poly-glycolic acid(PGA).

Materials and Methods : We analyze the postoperative results of 14 patients who recieved fixation by absorbable rod for the radial head and neck fractures from March 1991 to March 2000. All of the fractures were are reducible and modified Mason 's type II.

Results : After average 15 months follow up, flexion contracture was average 20 degrees and full flexion was average 130 degrees. Complications were occurred in 6 cases. Osteolysis was occurred in 3 cases and in 2 cases among theses 3 cases, radial head excision was performed. Synovitis was occurred in other 3 cases and in one case joint fluid was drained from operation wound for 2 weeks and in other 2 cases, synovitis was progressed to arthritis.

Conclusion : The absorbable rod made of PGA in radial head and neck fracture have relatively high rate of adverse tissue responses. So surgeon should consider adverse tissue response of PGA. Development of more biocompatible absorbable and slow degrading material should be needed.

Key ward : Radius, Head and neck fracture, Absorbable rod, Complication

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