

Simultaneous bilateral Mason type IIb radial head fractures in a young female: Was an increased carrying angle the cause?

Pradyumna R. Raval, Clíodhna Ni Fhoghlu, Anant Narayan Mahapatra

Department of Orthopaedics, Our Lady of Lourdes Hospital, County Louth, Ireland

Address for correspondence:

Dr. Pradyumna Raval,

Department of Orthopaedics, Our Lady of Lourdes Hospital, Drogheda, County Louth, Ireland.

E-mail: raval.prashant@gmail.com

ABSTRACT

Radial head fracture is the most common type of elbow fracture in adults. It results from a fall on an outstretched hand. However, simultaneous bilateral radial head fractures are extremely rare. We report a case of simultaneous bilateral mason type IIb radial head fractures in a young female, which was treated nonoperatively with excellent results.

Keywords: *Bilateral, Mason type IIb, nonoperative, radial head fractures, simultaneous*

Introduction

Bilateral radial head fractures are a rare entity; of which the incidence of simultaneous bilateral fractures is <1%.^[1] Elbow biomechanics plays a vital role in the nature of the injury.^[2] Treatment options are largely dependent on the fracture type, with nonoperative treatment recommended for Mason type I and operative treatment recommended for Mason type II–IV radial head fractures.^[1] We discuss a case of simultaneous bilateral type IIb radial head fractures treated successfully without surgery.

Case Report

A 47-year-old right-handed lady presented to our clinic with a 3 weeks history of fall on outstretched hands while on vacation abroad. She tripped over a small wall and fell, supporting herself on both palms. Initially, she had pain in both elbows with limited range of movement. Radiographs revealed that she had sustained bilateral radial head fractures. She was placed in above elbow back slabs while abroad.

On clinical examination at our clinic 3 weeks later this patient had minimal tenderness on palpation over the radial head

Access this article online	
Quick response code 	Website: www.joas.in
	DOI: 10.4103/2319-2585.167980

area. There was no swelling appreciated. Her movements were terminally painful, but the intensity of pain was less. She was advised to mobilize within her limits of pain, and bilateral slings were given for comfort. It was evident radiologically that she had sustained bilateral Mason type IIb radial head fractures [Figures 1 and 2].

At a 6 weeks follow-up, she was much more comfortable, and it was decided to commence mobilisation under the guidance of a physiotherapist.

This patient was regularly reviewed at 3, 6, 9 months, and 1-year. On final follow-up 2 years later her radiographs revealed that the fractures had completely healed [Figures 3 and 4], and she had a painless range of movement [Figures 5-7].

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Raval PR, Fhoghlu CN, Mahapatra AN. Simultaneous bilateral Mason type IIb radial head fractures in a young female: Was an increased carrying angle the cause?. *J Orthop Allied Sci* 2015;3:76-8.



Figure 1: Initial radiograph of left elbow



Figure 2: Initial radiograph of right elbow



Figure 3: Final radiograph of left elbow



Figure 4: Final radiograph of right elbow



Figure 5: Clinical photograph - neutral position



Figure 6: Clinical photograph - supination

Discussion

Radial head fracture is the most common type of elbow fracture

in adults and results from a fall on an outstretched hand.^[3,4] The position of the forearm and flexion at the elbow during actual impact play a significant role in the load transfer occurring at the radiocapitellar joint. Maximum forces at the radiocapitellar joint



Figure 7: Clinical photograph – pronation

are observed in a pronated forearm with a flexion of $<30^\circ$ at the elbow joint.^[5] Varus and valgus angulations at the elbow also play an equally vital role, with almost 97% of patients having a load transmission occurring at the radiocapitellar joint in the valgus position.^[6,7]

Radial head fractures were originally classified by Mason into four types based primarily on the displacement of the fracture fragments.^[8] This classification was further modified by Johnston wherein the Essex-Lopresti injury was considered [Table 1].^[9] The radial head is susceptible for a fracture because of an angulation of about 15° between the radial neck and shaft.^[4,10,11] The frequency of radial head fractures is reported to be around 1% of all fractures.^[12] A recent study has specifically reported the incidence of simultaneous bilateral fractures to be $<1\%$.^[1]

Kovar *et al.*, recommended that all patients with type II–IV radial head fractures should undergo operative fixation for a better outcome. Similarly Kutscha-Lissberg *et al.* recommended operative fixation for fractures of type IIb and higher.^[12] However, a noteworthy point is that Kutscha-Lissberg *et al.* had only one patient with simultaneous bilateral Mason type IIb injury in their study population.

Our patient had simultaneous bilateral Mason type IIb radial head fractures, which is extremely rare. The senior author is of the opinion that an increased carrying angle in this female patient of 18° could well have caused something like the “nutcracker effect” leading to these fractures. In a classic case of “nutcracker effect,” the medial portion of the radial head is compressed between the capitulum and the radial shaft and lateral part of the radial head.^[13] Our patient, however, had bilateral radial head fractures with a minimal lateral displacement of the radial head fragment, hence though not exactly identical, but the mechanism could be similar to that of the “nutcracker” effect. In our opinion, an increased valgus angulation at the elbow and classical

Table 1: Modified Mason classification

Type I	Fracture of the radial head without displacement
Type IIa	Fracture of the radial head, displacement <2 mm
Type IIb	Fracture of the radial head, displacement >2 mm
Type III	Comminuted fracture of the radial head
Type IV	Fracture of the radial head with elbow instability
Type V	Fracture of the radial head with an Essex-Lopresti injury

position of forearms in pronation during impact compounded the loading forces at the elbow joint resulting in simultaneous bilateral fractures.

Conclusion

Although operative treatment is recommended for Mason type II fractures, we firmly believe that each case is unique and must be treated on its individual merit. A detailed history, specifically of the attitude of the extremity on initial impact and individual anatomic variations should also be considered. The excellent outcome noted in this particular case of late presentation justifies our approach of treating this injury without any operative intervention.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Kovar FM, Jaendl M, Thalhammer G, Rupert S, Platzer P, Endler G, *et al.* Incidence and analysis of radial head and neck fractures. *World J Orthop* 2013;4:80-4.
2. de Haan J, Schep NW, Eygendaal D, Kleinrensink GJ, Tuinebreijer WE, den Hartog D. Stability of the elbow joint: Relevant anatomy and clinical implications of *in vitro* biomechanical studies. *Open Orthop J* 2011;5:168-76.
3. Muzaffar N, Bashir N, Baba A, Ahmad A, Ahmad N. A case study in bilateral radial head fractures in apparently trivial trauma: A subtle diagnosis. *Ortop Traumatol Rehabil* 2011;13:601-6.
4. Shariff Z, Patel KJ, Elbo A, Guisasaola I. Bilateral radial head fractures in a woman with trivial trauma. *Med Gen Med* 2005;7:8.
5. Morrey BF, An KN, Stormont TJ. Force transmission through the radial head. *J Bone Joint Surg Am* 1988;70:250-6.
6. Amis AA, Miller JH. The mechanisms of elbow fractures: An investigation using impact tests *in vitro*. *Injury* 1995;26:163-8.
7. Markolf KL, Lamey D, Yang S, Meals R, Hotchkiss R. Radioulnar load-sharing in the forearm. A study in cadavera. *J Bone Joint Surg Am* 1998;80:879-88.
8. Mason ML. Some observations on fractures of the head of the radius with a review of one hundred cases. *Br J Surg* 1954;42:123-32.
9. Johnston GW. A follow-up of one hundred cases of fracture of the head of the radius with a review of the literature. *Ulster Med J* 1962;31:51-6.
10. Deshmukh NV, Shah MS. Bilateral radial head fractures in a martial arts athlete. *Br J Sports Med* 2003;37:270-1.
11. Hodge JC. Bilateral radial head and neck fractures. *J Emerg Med* 1999;17:877-81.
12. Kutscha-Lissberg F, Platzer P, Thalhammer G, Krumböck A, Vécsei V, Braunsteiner T. Incidence and analysis of simultaneous bilateral radial head and neck fractures at a level I trauma center. *J Trauma* 2010;69:907-12.
13. Muzaffar N, Bhat A, Shah N. Excision of radial head fractures with medially displaced fragments using 2 incisions: The nutcracker effect. *Orthopedics* 2012;35:e1488-91.