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A Case Study in Bilateral Radial Head Fractures in Apparently Trivial Trauma: a Subtle Diagnosis

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SUMMARY

Radial head and neck fractures are common in young to middle age adults and are seen in nearly 20 % of acute elbow injuries in this age group. These are usually associated with high energy traumas like falls from height, road traffic accidents and sports injuries. Unilateral radial head fractures are relatively common and may be associated with other concomitant injuries. Bilateral radial head fractures are rare and are mostly seen in situations when the patient has a fall on outstretched, supinated hands or a direct fall on the elbow. These injuries can be easily missed by the attending physician if the symptoms are more severe on one side, thus neglecting the other. The treatment of these fractures may be conservative or operative, depending upon the degree of head comminution, the percentage of articular surface involved, presence of loose intra-articular fragments and angulation between the radial neck and proximal shaft.

We present a case series of three patients with bilateral type 1 radial head fractures (one case having type 3 on one side) managed with brief immobilization followed by active physiotherapy and full, uneventful recovery. The emphasis in these cases is the need for a high index of suspicion in the diagnosis of multiple injuries, no matter how `trivial` the mechanism of injury and, unless the history of the mode of trauma is highly suggestive, such injuries can be missed easily and cause long term problems for the patient.

Key words: radial head, bilateral, fracture, physiotherapy

BACKGROUND

A rare injury which is often missed due to oversight or inattention to the mode of trauma is elucidated and three cases presented with different modes of trauma but similar presentations which can be missed easily if due attention is not paid to the mechanism of trauma and clinical presentation. The stress is laid on timely detection, brief immobilization followed by proper physiotherapy which makes the difference between a good outcome and a stiff elbow. A brief review of literature of this uncommon injury and modes of treatment is also given.

Case 1: A 29-year-old male volleyball player reported with pain in both the elbows after falling down with both the elbows in extension while playing volleyball. On examination, there was mild ecchymosis on the left elbow with tenderness over the radial head on both sides. There was no restriction to the range of movement. Anteroposterior (AP) and lateral radiographs of both the elbows revealed undisplaced Mason type 1 radial head fractures (Fig.1-4). Bilateral long arm POP slabs for 10 days followed by slings for 10 days were instituted and subsequent active range of motion exercises followed for two weeks. At 3 weeks, the slings were discarded and the patient was put on physical therapy and at three months, he was pain-free and had no limitation of motion. He has again started playing volleyball, albeit with elbow guards!

Case 2: A 24-year-old male student was carrying a heavy flower pot in his garden when he suddenly tripped against a hose pipe and fell down with both elbows hitting the grass simultaneously while still clutching the flower pot. He felt sharp pain in the left elbow while the other elbow had some superficial abrasions and was not so tender. However, due to painful rotations, the radiographs of both elbows were taken which revealed bilateral Mason type 1

Fig 1.1. Case 1. AP radiograph of right elbow showing Mason type 1 radial head fracture

Fig 1.2. Case 1. Lateral radiograph of right elbow showing Mason type 1 radial head fracture

Fig 1.3. Case 1. AP radiograph of left elbow showing Mason type 1 radial head fracture.

Fig 1.4. Case 1. Lateral radiograph of left elbow showing Mason type 1 radial head fracture

Fig 2.1. Case 2. AP and Lateral radiograph of right elbow showing Mason type 1 fracture.

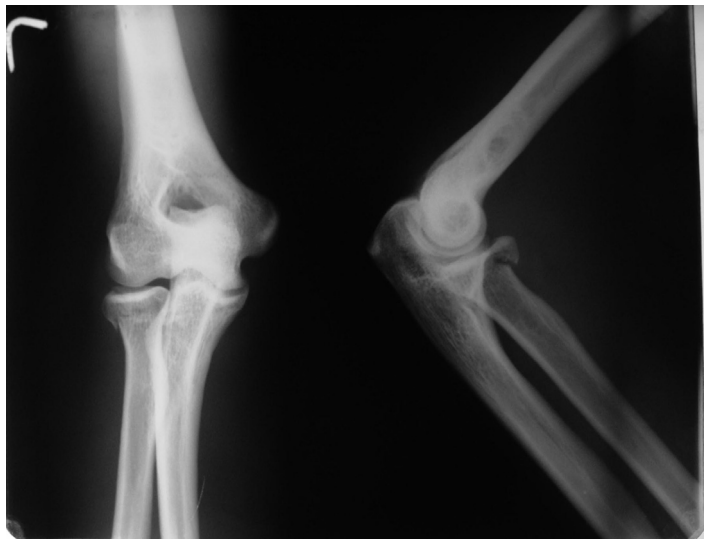

Fig 2.2. Case 2. AP and Lateral radiograph of left elbow showing Mason type 1 fracture.

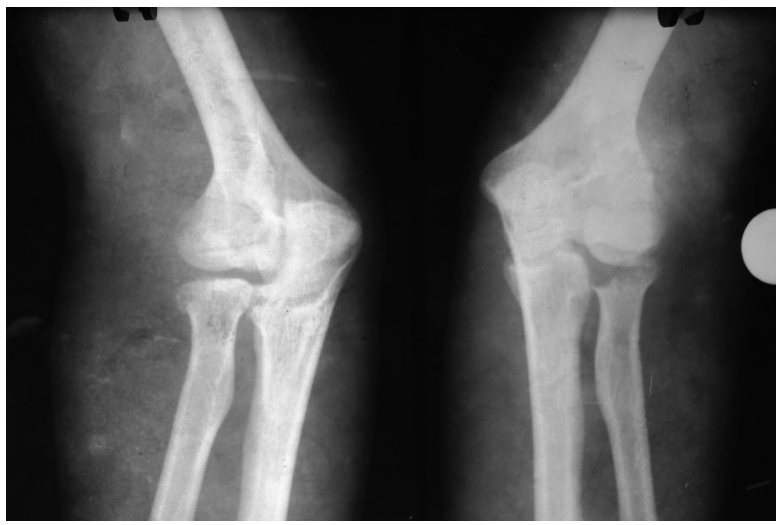

Fig 3.1. Case 3. AP radiograph of both elbows showing Mason type 3 fracture of right and Mason type 1 fracture of the left radial head.

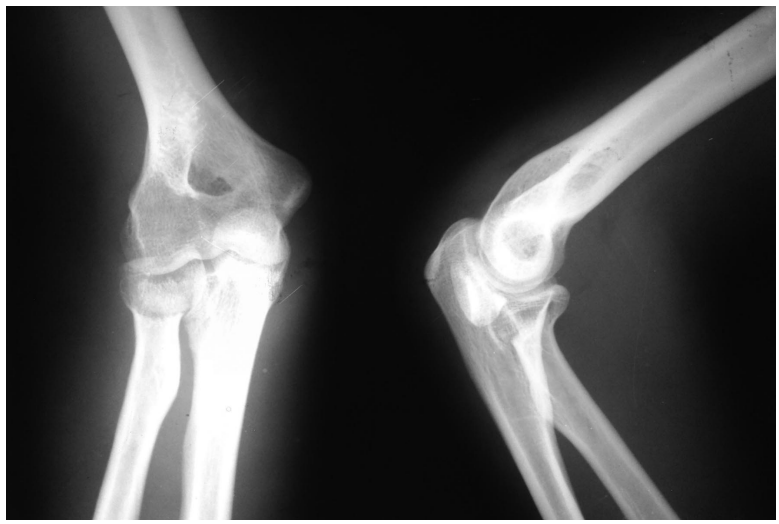

Fig 3.2. Case 3. AP and Lateral radiograph of left elbow showing Mason type 1 fracture.

Fig 3.3. Case 1. AP and Lateral radiograph of right elbow showing Mason type 3 fracture.

radial head fractures. The management was similar to case 1 and the outcome was excellent.

Case 3: A 36-year-old salesman was involved in a road traffic accident with his bike hitting a car and he was flung in the air, landing on his outstretched hands and knees. He reported to the emergency with severe pain in his right knee and left elbow where after clinicoradiological examination, a preliminary diagnosis of Mason type 3 radial head fracture of the left elbow and patellar fracture on the right side was made. However, after the patient was posted for surgery, he complained of persistent pain in the right elbow with limited motion. X rays revealed a Mason type 1 fracture. The radial head on the left side was excised, tension band wiring of the patella was done and the contralateral radial head fracture was managed conservatively. At 6 months follow up, the operated side had 15° limitation of flexion while the other side had no limitation of motion.

DISCUSSION

Radial head fractures are amongst the most common fractures occurring around the elbow in adults, accounting for 1.5% to 4% of all fractures and approximately 33% of all elbow fractures [1]. Although radial head fractures can occur in isolation, associated fractures and ligament injuries are common. Assembling the clinical presentation, physical examination, and imaging into an effective treatment plan can be challenging. The mechanism of injury in radial head and neck fractures is usually a fall onto an outstretched hand with a partly flexed elbow and pronated forearm causing longitudinal impact of the radius against the capitellum. The force of trauma is transmitted along the forearm producing a valgus stress at the elbow causing compression of the radial head against the capitellum which results in fractures due to shear between the vertically aligned trabeculae and may also injure the capitellum. Clinically, moderate to severe pain, local tenderness with swelling and a positive fat pad sign with a fracture line on radiography are diagnostic features. Conventional radiography with AP & lateral views is usually adequate for detection of radial head and neck fractures. Internal and external oblique radiographs are required occasionally. CT with reconstruction images is of help in doubtful cases and aids in decision making.

Support can be found for virtually every type of treatment, from prolonged immobilization to operative fixation and rapid functional loading. The characteristics of the radial head fracture influence the technique used to optimize the outcome. Mason's classification (based on the severity of radial head and neck fracture) is used clinically to formulate the type and extent of treatment [1]. Mason classified radial head fractures into three groups. Type I is an undisplaced marginal fracture. Type II is a displaced marginal fracture and type III is a comminuted fracture. A fourth group was subsequently added, i.e., type IV, which includes any radial head fracture with dislocation of the humeroulnar joint. Since type I fractures cause no mechanical block to elbow motion and require no reduction, they are treated conservatively. Joint aspiration of haemarthrosis and injection of an anaesthetic into the joint may be performed to reduce pain. The main problem after a radial head fracture is failure to gain full extension, probably caused by damage sustained by the capitellum of the humerus at the time of injury and more importantly, fibrosis of the anterior capsule of the joint after organisation of

haemarthrosis [2,3]. Mason and Shutkin suggested that early motion helps to shape and mould slight incongruities without substantial risk of displacement [4]. Bakalim showed that displacement of the fragment did not cause loss of function [5]. Unsworth-White et al concluded that extension splintage was superior to immobilisation in flexion [6]. Aspiration of elbows, championed by Postlethwait, was finally discredited by Gaston, who showed that although aspiration may ease initial pain, it does not affect the long term result [7,8]. Injecting the joint with a local anaesthetic to determine if motion is blocked was first suggested by Quigley [9]. Holdsworth et al. conducted a prospective, controlled trial of 60 cases but failed to show any long-term advantage with this technique, intra-articular infection being a potential risk [10]. Thus, its use can be supported mainly for diagnostic purposes and to provide acute pain relief. They concluded that functional recovery was best in younger patients and was closely related to the severity of the fracture. They stated that aspiration of the elbow is a quick, safe, and painless procedure which greatly reduces discomfort to the patient and allows early return of movement of the elbow, but failed to show any difference in the functional outcome between the aspirated and non aspirated group. Carley suggested that aspiration may benefit patients with traumatic elbow effusions and that the evidence was insufficient to recommend it as a routine procedure [11]. Deshmukh advocated early movement for prevention of elbow stiffness in a bilateral radial head fracture [12].

CONCLUSION

We present this case as a timely reminder for orthopedic surgeons who, when dealing with trivial injuries, should examine patients with a high index of suspicion for bilateral injuries. No matter how 'trivial' the mechanism of injury may be, the presence of one easily diagnosed injury should not rule out a thorough examination of the patient for other injuries. We conclude that type 1 radial head fractures are to be treated conservatively and early movement is advocated for prevention of elbow stiffness. In bilateral radial neck fractures, management with sling immobilization makes day-to-day activities difficult if not impossible; therefore, help with these activities is highly recommended. In the acute phase analgesia to control pain and ensure motion is of prime importance. Aspiration of haemarthrosis, though it gives pain relief initially, does not seem to influence the long term results. Early mobilization should be considered for "stable" fractures that involve less than one third of the articular surface or for fractures in elderly, low-demand individuals. In active individuals, however, fractures involving more than a third of the articular surface should be treated with splint or sling support for 10 to 14 days, followed by protected functional activities for an additional 7 to 10 days. The prognosis for this group is generally good, although Mason reported that one-third of the patients in a large series lost an average of 7° of extension; it is prudent to warn patients that this might occur. Though some patients lack terminal degrees extension it does not interfere with their functional activities.

REFERENCES

1. Hodge JC. Bilateral Radial Head and Neck Fractures. The Journal of Emergency Medicine.1999; 17:877-81
2. Mason ML. Some Observations of Fractures of the Head of Radius with a Review of One Hundred Cases. British Journal of Surgery 1954; 42:123-132
3. Pinder IM. Fracture of the Head of the radius in Adults (Abstract).J.Bone & Joint Surgery.1945; 67:77-80.
4. Mason JA,Shutkin NM.Immediate active mobilisation in the treatment of fractures of the head and neck of the radius with a review of hundred cases. Surg.Gynaecol. Obstet.1943; 76:731-7
5. Bakalim G.Fractures of Radial Head and Their Treatment.Acta Orthop. Scand.1970; 41:320-31.
6. Unsworth-White J, Koka R, Churchill M, et al.The non-operative management of radial head fractures. A Randomised trial of three treatments. Injury. 1994; 25:165-7.
7. Postlethwait RW.Modified Treatment for Fracture of the Head of Radius. Am J.Surg.1945; 67:77-80.
8. Gaston SR, Smith FM, Baab OD. Adult injuries of the radial head and neck. Am J Surg 1949;78:631–5.
9. Quigley TB.Aspiration of the Elbow Joint in the Treatment of Fractures of the Head of the Radius.N. Engl. J. Med. 1949; 240:915-6.
10. Holdsworth BJ,Clement DA,Rothwell PNR. Fractures of the Radial Head-The Benefit of Aspiration: A Prospective Controlled Trial.Injury.1987; 18:44-7.
11. Carley S. The role of therapeutic needle aspiration in radial head fractures. J Accid Emerg Med. 1999.16(4):282.
12. Deshmukh NV, Shah MS. Bilateral radial head fractures in a martial arts athlete: Br J Sports Med. 2003; 37 (3): 270-1.

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