

Radius shaft fracture combined with a dislocation of the radial head - A rare pattern of injury

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The authors have nothing to disclose

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INTRODUCTION

Injury combinations consisting of fracture and dislocation in the forearm and adjacent joints are well described in the literature: Monteggia fractures (proximal fracture of the ulna and luxation of the radial head), Galeazzi fractures (distal or shaft fracture of the radius and luxation of the distal ulna) and the Essex-Lopresti Lesion. We present a case with a combination of a diaphyseal radius fracture with a ventral dislocation of the radial head after open reduction and internal fixation (ORIF) of the radius shaft. We assume the presence of an unidentified concomitant lesion of the interosseous membrane and rupture of the annular ligament preoperatively without sub-/luxation in the proximal radioulnar joint.

CASE

Case: A male patient (28y) presented after a bicycle accident with a fall onto the outstretched left arm. Trauma mechanism consisted of axial compression and additional direct contusion of the forearm. Preoperative X-rays (shown in Figure 1) showed a radial fracture at the middle of the diaphysis with a possible dislocation in the distal radioulnar joint (suspected Galeazzi fracture).

The patient underwent emergent ORIF of the radius shaft fracture with a LCP 3.5mm 9 hole plate. Distal radioulnar joint appeared reduced and stable after ORIF of the radial shaft fracture. An upper arm cast was postoperatively applied for the initial immobilization until subsidence of the soft tissue irritations.

Postoperative X-rays at first day (shown in Figure 2) surprisingly showed an anterior dislocation of the radial head in the elbow joint with accurate reduction of the radius shaft. Clinically the patient was asymptomatic at this time.

An attempt of closed reduction of the dislocated radius head failed. Revision surgery using the Kaplan approach with open reduction of the radial head, suture of the annular ligament and refixation of the capsular ligamentous complex to the lateral epicondyle with a suture anchor was performed.

Postoperative X-rays showed a correct articulation of the joint.

For 6 weeks the patient performed non-weight-bearing mobilization in an elbow motion orthosis, followed by increased strengthening.

3 months postoperatively the patient was nearly asymptomatic with regular radiologic follow up (Fig. 4), slightly limited range of motion (flexion/extension 120/5/0; pro-/supination 70/0/50) and stable joint.

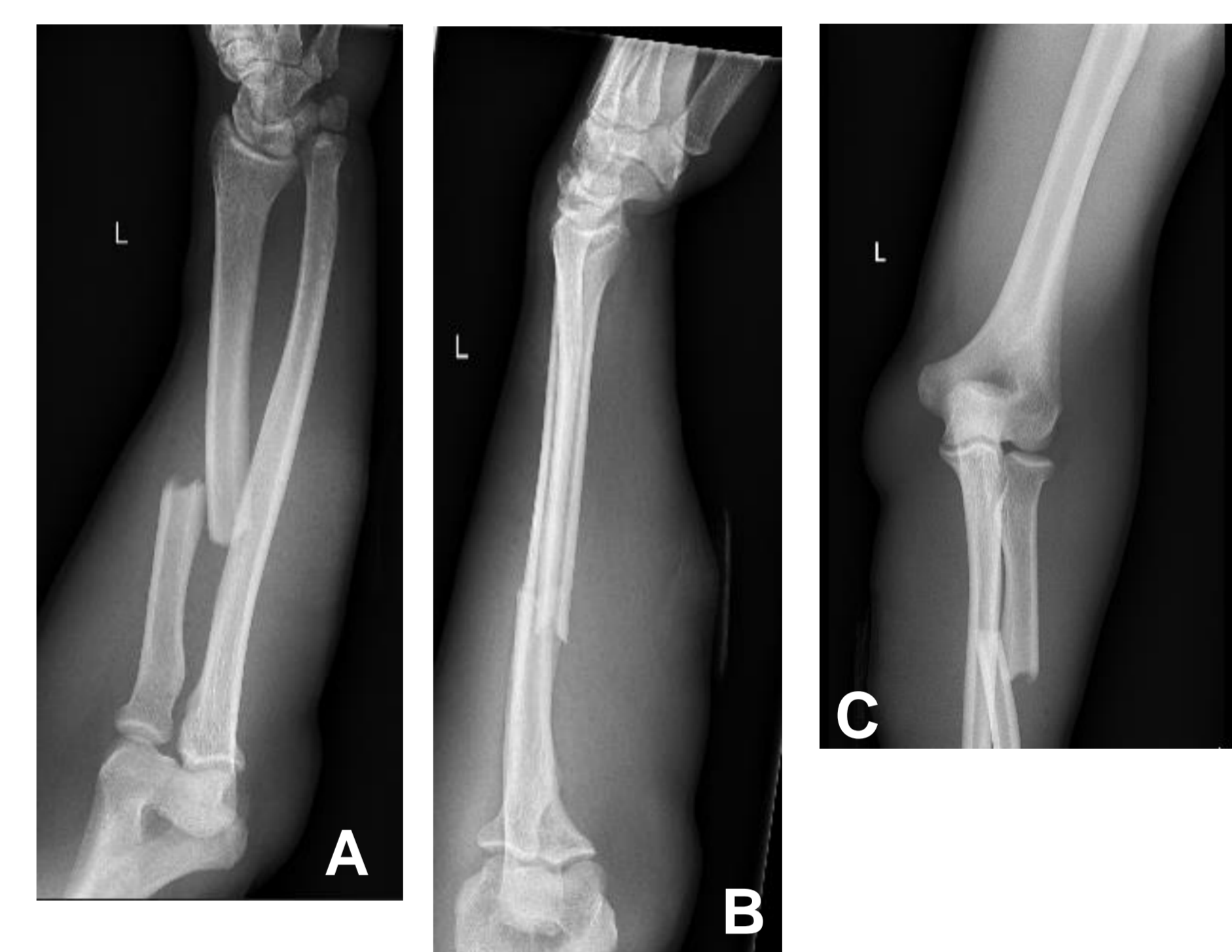


Fig. 1: Preoperative Radiographs:
A AP-view of the left forearm
B Lateral view of the left forearm
C AP-view of the proximal left forearm

DISCUSSION

On closer inspection of the postoperative radiographs (Fig. 2, 3) a small osseous fragment in the region of the interosseous membrane (IOM) can be seen indicating a possible osseous avulsion of the IOM. Hence, we assume the presence of an unidentified concomitant lesion of the IOM and rupture of the annular ligament without sub-/luxation in the proximal radioulnar joint. To our best knowledge, this is the first published case describing the combination of these injuries. Hayami et al. described in a biomechanical study the importance of the IOM as stabilizer in preventing an anterior radial head dislocation¹. The importance of the IOM in stability in the forearm has also been found by Julie E. Adams² and tested in axial force by Hwang, et al.³. Not only in Monteggia – fractures, but also in proximal radial shaft fractures thorough testing of the radial head stability is necessary due to possible additional IOM lesion.

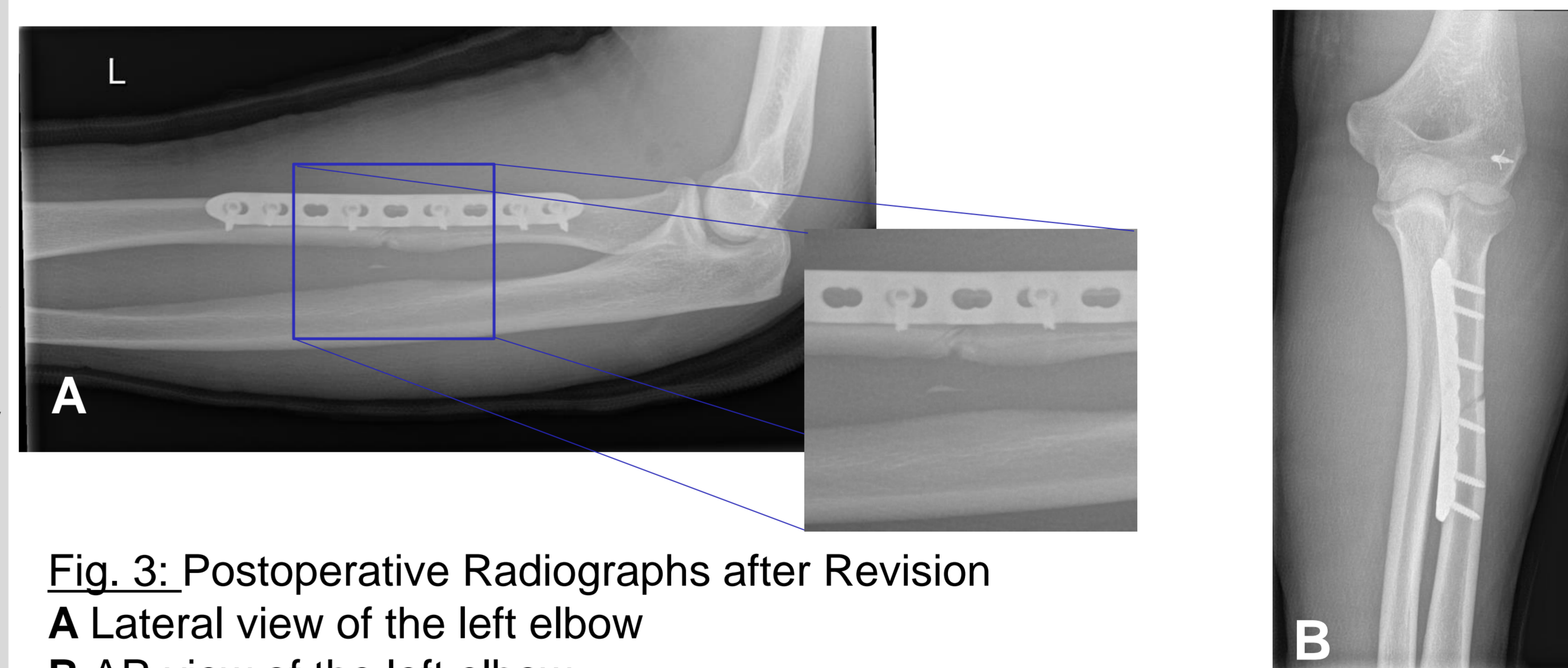


Fig. 3: Postoperative Radiographs after Revision
A Lateral view of the left elbow
B AP-view of the left elbow

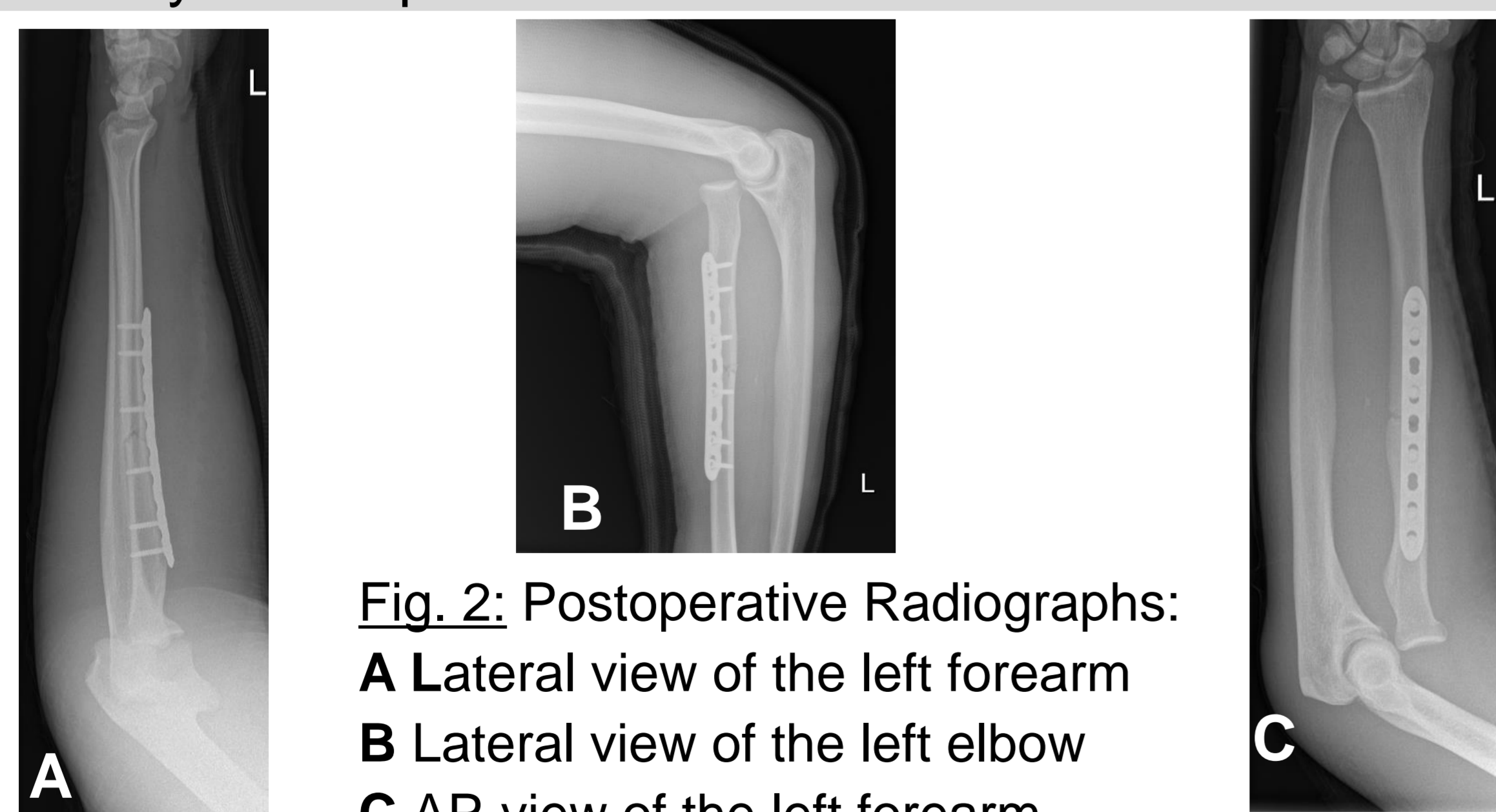


Fig. 2: Postoperative Radiographs:
A Lateral view of the left forearm
B Lateral view of the left elbow
C AP-view of the left forearm

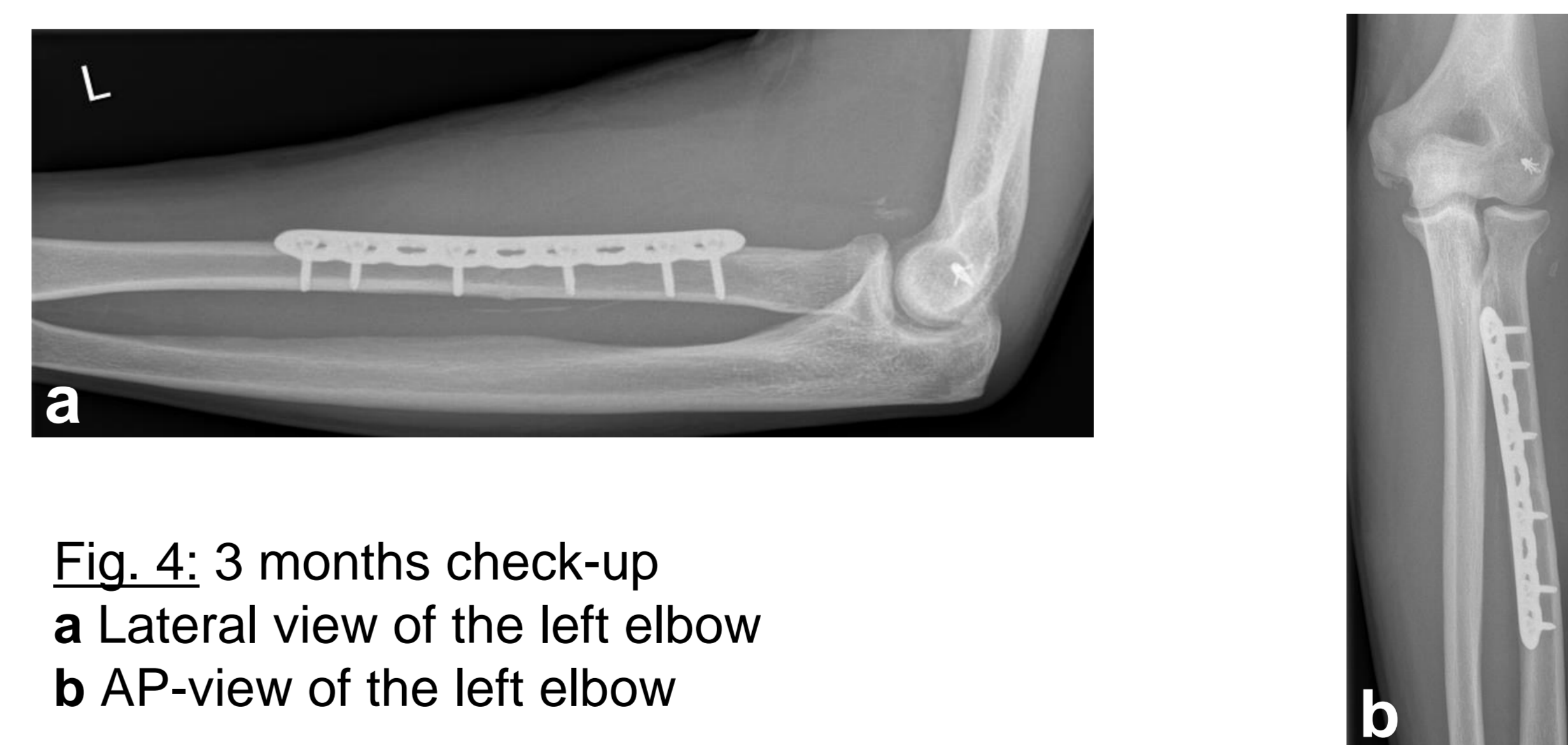


Fig. 4: 3 months check-up
a Lateral views of the left elbow
b AP-view of the left elbow

CONCLUSION

The combination of a radius shaft fracture and a dislocation of the radial head is very rare and to our best knowledge, not yet described in the literature. If a lesion of the IOM is present, an instability of the radial head should be excluded. In this situation we recommend a careful intraoperative clinical and radiologic evaluation of the stability of the radial head.

References

- Hayami, N., Omokawa, S., Iida, A. et al. Biomechanical study of isolated radial head dislocation. *BMC Musculoskelet Disord* 18, 470 (2017)
- Julie E. Adams, MD, Forearm Instability: Anatomy, Biomechanics, and Treatment Options, *J Hand Surg Am.* 2017;42(1):47e52
- Hwang JT, Kim Y, Shields MN, Bachman DR, Berglund LJ, Fitzsimmons AT, Fitzsimmons JS, O'Driscoll SW. Effects of axial forearm instability on force transmission across the elbow. *J Shoulder Elbow Surg.* 2019 Jan;28(1):170-177. doi: 10.1016/j.jse.2018.07.016. Epub 2018 Oct 15. PMID: 30337267.