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Displaced acromion fracture: A rare injury, case report



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ABSTRACT

INTRODUCTION: Acromion fractures are extremely rare. There are no common accepted treatment schemes and fixation methods. We aimed to present a case which may contribute to the diagnosis and treatment of acromion fracture in a patient with polytrauma.

PRESENTATION OF CASE: Acromion fracture associated with scapula and clavicle fractures was diagnosed in a 40-year-old patient and treated with open reduction and cannulated screw fixation. The fracture healing was completed without causing subacromial impingement.

DISCUSSION: In patients with polytrauma, diagnosis and treatment of acromion fractures can be delayed or overlooked. In improperly treated acromion fractures; pain, movement restriction, subacromial impingement, rotator cuff injury and symptomatic nonunion can occur.

CONCLUSION: We recommend early surgical treatment for displaced acromion fractures, reduction of subacromial space and disruption of the superior shoulder suspensory complex.

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1. Introduction

The acromion is a large bony projection on the superior end of the scapula. Acromion fractures are rare injuries. They constitute 8%–16% of scapula fractures [1,2]. Recently, they are seen at the rate of 5%–6.9% as the complication of reverse shoulder arthroplasty [3]. Acromion fractures may occur as a result of shoulder trauma and overuse injuries. Acromion fractures may occur with glenoid process, scapula or clavicle distal fractures and disruption of superior shoulder suspensory complex [4]. There are no widely accepted treatment algorithm and fixation method of acromion fractures [5]. We aim to present a case report that contributes to diagnosis and treatment of acromion fractures. This case includes a polytrauma that involves scapula, clavicle, ulna and radius fractures accompanying acromion fracture.

The following case report is compliant with SCARE guidelines [6].

2. Presentation of case

40-year-old male patient was evaluated in emergency room after motor vehicle accident. Patient was a motorcycle driver, an amateur swimmer, non-smoker, non-drug user. He had a normal psychosocial history. He and his family did not have a specific genetic history. He had ecchymosis, crepitation and deformity on his right arm, clavicle, scapula and forearm. He had no neurovas-

cular deficit. On radiographic examination of the patient, right scapula nondisplaced body fracture, right acromion fracture (Fig. 1), right clavicle fracture and right ulna and radius shaft fracture were detected. A long arm cast and an arm sling were applied to the patient. On the CT scan applied for shoulder area (Fig. 2), acromion fracture was classified as Type 1 according to Ogawa, Type 3 according to Kuhn and Type A1 according to AO. Patient was informed about surgery and he agreed with early intervention and osteosynthesis.

The patient was operated after he came to emergency service. Surgery was performed by an orthopaedic surgeon. Longitudinal incision was applied between clavicle shaft and anterosuperior edge of acromion. Reduction and fixation by anatomical clavicle plate was applied to clavicle comminuted fracture. Fixation was completed by placing anatomical clavicle plate. Acromion fracture was reached over by entering between trapezius and deltoid muscles. Fracture line was transverse (Fig. 3). There was a reduction of subacromial space. Subacromial space and rotator cuff were observed through the fracture line. Rotator cuff was intact. Fracture reduction was applied. Compression was applied to fracture line via two 3.00 mm cannulated screws (Fig. 3). Fixation was evaluated after fluoroscopy application (Fig. 3). It was observed that the fixation was stable. Forearm fractures of the patient were also operated by applying fixation with open reduction and plate screw on the same operation.

The patient was hospitalized for wound care for five days. Arm sling was used after surgery. On radiographic evaluations, reduction was observed to be successful on fracture line (Fig. 4). The post-operative period was uneventful. The patient tolerated surgery and physical therapy easily. The patient started passive

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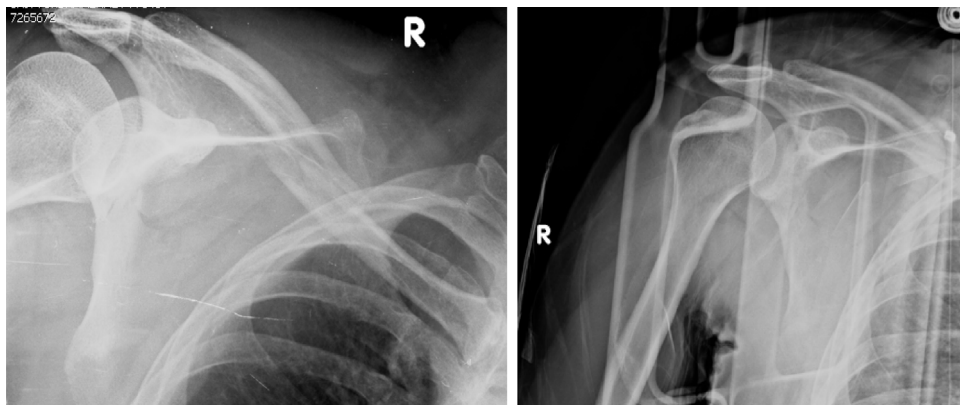


Fig. 1. Preoperative shoulder x-ray.

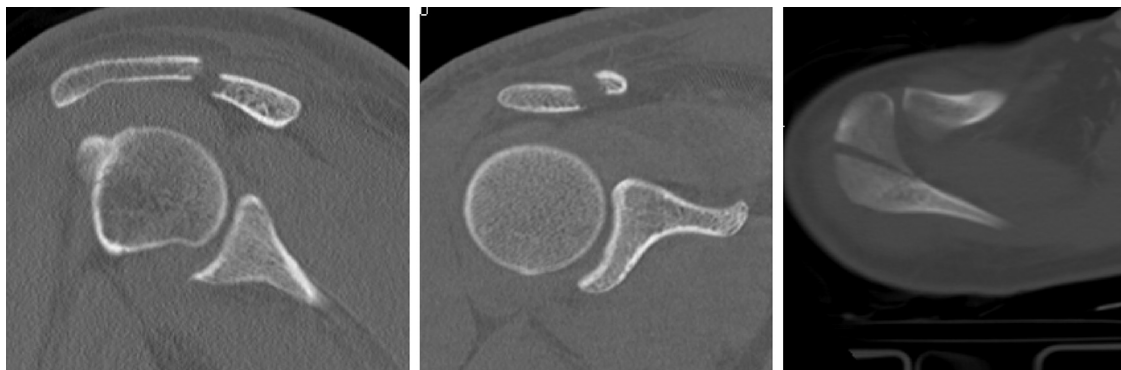


Fig. 2. Preoperative CT scan.



Fig. 3. Akromion fracture, fixation with cannulated screw and fluoroscopic view.

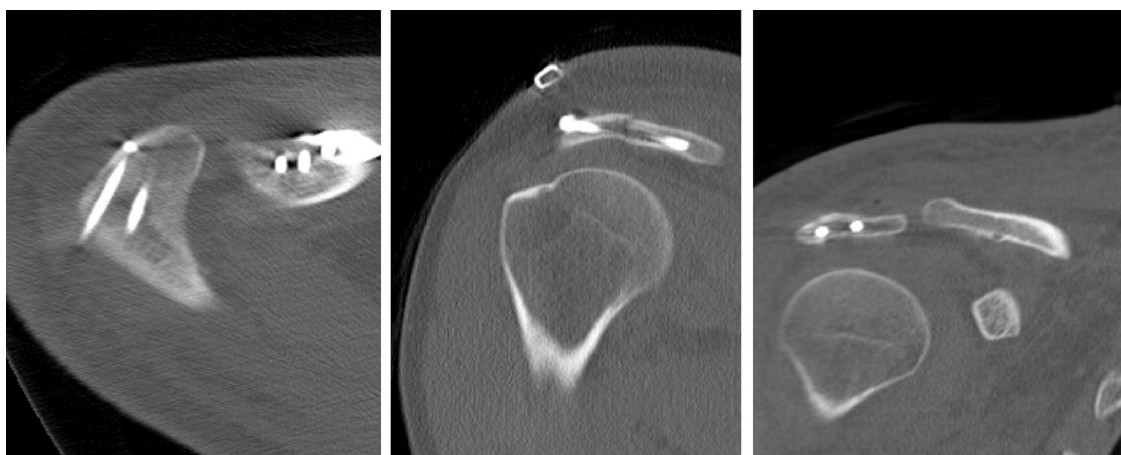


Fig. 4. Postoperative CT scan.

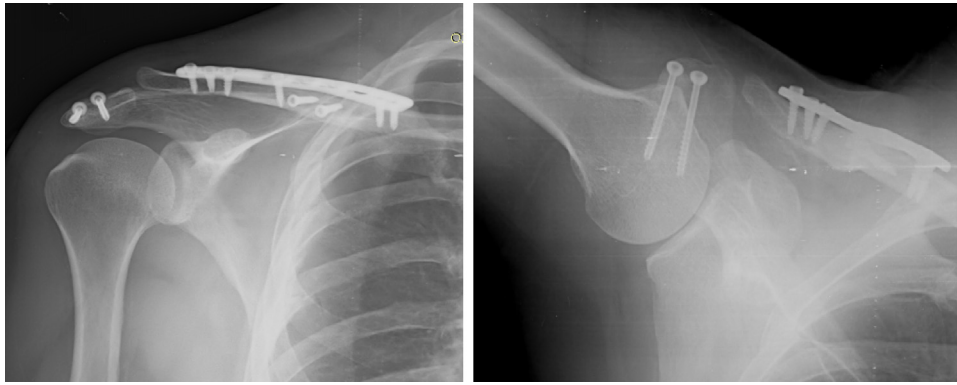


Fig. 5. Postoperative 3rd months x-ray.

shoulder exercise 2 weeks after surgery and active shoulder exercise 6 weeks after surgery. The patient returned to working again 8 weeks after surgery. There was no complaint of pain on the 3rd month post-operative examination of the patient. On the same examination, the patient's right shoulder flexion was 160°, abduction was 150°, internal rotation was 45° and external rotation was 70°. And fracture union was completed (Fig. 5). There was no complaint of pain one year after surgery. Constant shoulder score was 94.

3. Discussion

Acromion fractures are rare injuries. In patients with polytrauma, diagnosis and treatment of acromion fractures can be delayed or overlooked. In improperly treated acromion fractures; pain, movement restriction, subacromial impingement, rotator cuff injury and symptomatic nonunion can occur [5,7,8].

There are three classifications in acromion fractures. Ogawa and Naniwa [9] classified the fractures of spinoglenoid notch lateral as Type 1 and fractures of medial as Type 2. Kuhn [10] used a classification algorithm based on fracture displacement. He classified acromion fractures as follows; Type 1, minimally displaced, Type 2, displaced but do not reduce subacromial space and Type 3, cause a reduction in subacromial space. AO/OTA [11] classification is based on the level of comminution and displacement. In our case report, the acromion fracture is classified as Type 1 according to Ogawa, Type 3 according to Kuhn and Type A1 according to AO/OTA.

The patient with clavicular fracture and acromion fracture was admitted as unstable because of two injuries on superior shoulder suspensory complex [4,5]. Acromion fracture caused reduction in subacromial space. Ogawa [9] determined a treatment method based on fracture type, fracture displacement and accompanying ipsilateral shoulder injuries. Kuhn [10] suggested surgical treatment for Type 3 fractures that cause reduction in subacromial space, symptomatic stress fractures and painful nonunions. In a recent study, according to Hill [5], symptomatic nonunion, subacromial impingement, displacement more than 1 cm, open fractures and disruption of superior shoulder suspensory shoulder complex require surgical treatment. In our case, we chose surgical treatment because the patient had superior shoulder suspensory complex injury and subacromial reduction.

Open reduction was applied by extending the incision to lateral, which was used to reach out clavicle fracture. We chose cannulated screw fixation because the pattern of fracture was transverse. Acromion fractures can be treated with K-wires [9,12,13], tension band [1,9,13], cannulated screw [5,16,17], and plate screw [5,14,15]. Fixation with K-wires is not recommended because it may cause early implant failure and stable reconstruction may not be achieved after surgery [18]. Goss [1] suggests tension band tech-

nique and reports good results. Hill [5] applied plate to all acromion fractures in a study carried out with 13 patients and reported that they removed only one plate due to implant irritation. In a recent study that Zhu [14] evaluated an acromion pedicle fracture, he analyzed perpendicular double-plate with a locking system and reported good results. In our study, we chose cannulated screw because the fracture was on the lateral side of acromion and it was not comminuted. We showed that compression with a good reduction and screw can make the fracture healing complete successfully. It is important to avoid screw penetration into subacromial space during fixation.

In acromion fractures, implant failure can be seen after fixation with K-wire. Irritation and infection can be seen after fixation with plate screw [5]. Zhu [14] reports temporary suprascapular nerve entrapment on patients with double-plate. In our case, we didn't encounter any intraoperative and postoperative complication.

Early surgical intervention to the patient can have a positive effect on fracture healing. Kim et al. [16] compared early and late treated acromion fractures and found out that while all the early surgically treated patients came back to their pre-fracture activities, the rate for late treated patients is 44%. On his study, Hill [5] showed that late treated patients can also get back to their work just as early treated patients do and reported that their shoulder scores are good. In our case, patient with polytrauma got back to his work 8 weeks after surgery and gained his preoperative activities 12 weeks after surgery.

4. Conclusion

Patient with shoulder trauma should be carefully examined for acromion fractures. Acromion fracture can be treated with good results with early surgical treatment and proper fixation. Surgical treatment is important to regain shoulder functions, as it enables early rehabilitation of treatment. Cannulated screw is enough and reliable for fixation. We recommend early surgical treatment for acromion fractures that reduce subacromial space and disrupt superior suspensory shoulder complex.

Conflict of interest

The authors declare that they have no conflicts of interest.

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Ethical approval

Not applicable.

Consent

Patient consent was obtained.
An informed consent has been obtained.

Author contribution

Özgür Çiçekli: contributed to surgery, data collection and writing of paper.

Abdulhalim Akar: contributed to data collection.

Hüseyin Nevzat Topçu: contributed to data collection and writing.

Guarantor

Özgür Çiçekli.

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