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Bilateral distal radius fractures with seven month pregnancy during the peak period of national lockdown due to COVID 19 pandemic in Nepal: A case report

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ABSTRACT

Introduction: Even though distal radius fracture is a common orthopedic problem, bilateral distal radius fracture associated with pregnancy is a very rare injury pattern.

A twenty-three years old female with seven-month pregnancy came to our hospital with a history of falling from 10 feet height and sustained a fracture on both sides of the wrist joint. On examination, there was a Grade IIIA open fracture on the right wrist, suspected closed fracture on the left wrist, and distended lower abdomen with estimated seven-month pregnancy. X-ray of bilateral wrist and forearm was performed along with ultrasonography of abdomen and pelvis.

She was successfully managed through debridement, K wires fixation, and external fixator on the right forearm while fracture on the left side was treated with closed reduction and percutaneous K wires fixation. However, the fetus was evacuated as dead because of concomitant intrauterine fetal injury even though we successfully saved the limb and life during the lockdown period with an extremely worst situation.

Conclusion: This combination injury in the same individual during the peak period of COVID 19 National Lockdown not only is a challenging condition that needs multidisciplinary management but also requires life and limb saving judicial surgical intervention in one of the worst surrounding environments.

1. Introduction

Distal radius fracture is one of the most common orthopedic injuries treated by orthopedic surgeons, however, simultaneous bilateral distal radius fracture in the adult population is a relatively rare injury.1,2,3 To the best of our knowledge, bilateral distal radius fracture associated with pregnancy during the lockdown period of COVID 19 is not only the challenging injury pattern but also un-reported in the literature to date. However, there are very few studies reporting bilateral distal radius fractures during pregnancy.4 Similarly COVID 19 pandemic is undoubtedly a dramatic situation spreading the whole world giving grave psychological and economical stress.5

We present a rare injury pattern in a pregnant woman and its most appropriate management during the peak of the national lockdown of the COVID 19 pandemic.

2. Case report

A twenty-three old female with seven-month pregnancy came to our hospital with a history of falling from 10 feet height and sustained a fracture on both sides of the wrist joint. On examination, there was a Grade IIIA open fracture on the right wrist, suspected closed fracture on the left wrist, and distended lower abdomen with estimated seven-month pregnancy. There were no injuries on other parts of the body except mild tenderness on the lower abdominal region. The patient was initially managed with ATLS protocols. After stabilization of vital systems, the wound on the right wrist was superficially washed with normal saline and splinted in support. Since there was no wound on the left side, it was simply supported in a splint. She was given one dose of injection tetanus toxoid intramuscularly and injection diclofenac for control of pain.

A blood sample was drawn and sent for full blood count, renal function, PT/INR, platelets, and cross-matching, while a nasal swab was sent for PCR test for COVID 19. The patient was sent for X-ray...
examination which showed Gustillo Anderson Type IIIA distal radius and ulna fracture on the right side (Fig. 1) and Frykman’s Type VI distal radius fracture on the left side (Fig. 2). Since she was seven months pregnant, our second author examined the viability of the fetus by stethoscope first followed by ultrasonography examination which showed no fetal heart sounds. We discussed with each other as well as relatives of the patient and came to the conclusion of aborting the pregnancy followed by orthopedic procedures. Since this was a strict lockdown period of second-wave COVID 19 as declared by the Nepal Government, there was very little movement of people as well as lack of availability of even human blood, even though we managed to collect the required amount of blood and gathered all the operation theatre staffs to do emergency evacuation of a dead fetus in midnight.

After completion of the obstetric part, the patient was taken over by the orthopedic team. The patient was positioned supine on the operation table with the application of a tourniquet bilaterally. Painting and draping were done for both sides simultaneously. Extensive debridement was performed on the right side with an exploration of the wound and removal of devitalized tissue. Fracture ends of distal radius were reduced and fixed with K wires while ulna fracture after reduction was fixed with intramedullary K wires passed through the proximal end of the ulna. The whole construct was finally stabilized with an external fixator in slight

Fig. 1. Antero-posterior and lateral radiographs showing compound distal radius and ulna fractures right side.

Fig. 2. Antero-Posterior and lateral radiographs of left wrist showing comminuted distal radius fractures.
Fig. 3. Antero Posterior and Lateral radiographs showing reduction and fixation of radius and ulna with K wires and external fixator.

Fig. 4. Antero Posterior and Lateral radiographs of left wrist showing closed reduction and fixation with K wires.
distraction mode (Fig. 3). Fracture on the left side was reduced under C arm guidance by giving traction and counter traction and fixed with three percutaneous K wires through the lateral side and one from radius to ulna through the distal radio-ulnar joint (Fig. 4).

Postoperatively, the dressing was performed every day and intravenous antibiotic was continued till the proper healing of the wound. The patient was discharged 10 days after surgery and followed up every two weeks till 7 weeks when all the K wires and external fixators were removed. Since ulnar fracture was on the diaphyseal region which normally requires longer times to complete the union, intramedullary K wire which was previously applied at the time of index surgery was replaced by a larger diameter (3.5 mm) intramedullary TENS nail and discharged from hospital 3 days after the second surgery. Three months after surgery, her general condition was fine, the fracture on the left side was healed completely, and while distal radius on the right side was landed into nonunion. At the time of the accident, there was around a 7 cm long wound on the volar aspect of the wrist through which the proximal end of the fractured radius was protruded outside. In addition, the wound was heavily contaminated with external tissues while the fracture was severely comminuted. Some amount of bone loss at the time of cleaning the wound was unavoidable. Therefore, the combination of bone loss, avascular fracture end due to severe injury, and slight distraction made at the time of external fixator application (iatrogenic) made fracture to land into nonunion. Now, this distal radius nonunion was treated by open reduction and internal fixation with a volar locking plate, bone grafting, and K wire fixation (Fig. 5). Similarly, the distal end of the ulna was also not united at three months after index surgery, however, there were no signs of infection around this fracture clinically. Since this is a diaphyseal fracture, we anticipate delayed union of the ulna with the use of TENs. Since soft tissue around the distal ulna was compromised or scarred with fibrous tissue, we were not able to do open reduction and internal fixation of the distal ulna with dynamic compression plate and bone grafting.

3. Discussion

Bilateral open distal radius fracture and associated ulna fractures are uncommon and debilitating injuries. The ultimate goal is to achieve appropriate reduction, early mobilization, and adequate functional outcomes. Surgical treatment is preferred over the conservative treatment in distal radius fracture with post reduction radial shortening more than 3 mm, dorsal tilt more than 10°, and intra-articular step-off more than 2 mm.6 Management of fractures associated with pregnancy is one of the difficult tasks and it requires a multidisciplinary approach. Trauma itself and surgical procedures performed to operate the fracture have a tendency to cause fetal injury. Ultrasonography before proceeding with fracture fixation is mandatory to know the status of the fetus. Use of C arm should be avoided especially in the first trimester of pregnancy if possible.

Ravikumar et al.4 mentioned that bilateral distal radius fracture itself is a very rare clinical condition and association with pregnancy is not reported. Hormonal changes that are associated with pregnancy influence fracture healing indirectly. Management of this rare entity requires a multidisciplinary approach keeping in mind the effect of physiological and hormonal changes for fracture healing.

COVID 19 pandemic is undoubtedly a dramatic situation worldwide giving grave psychological and economical stress. It is undoubtedly a
significant “war” probably for the healthcare world as well. Shih et al. described the reduction in the frequency of orthopedic surgeries during the pandemic period could be solely attributed to patients’ fear of COVID-19. However, there is no alternate way to do the surgeries in fractured patients even during the lockdown period of COVID 19. Orthopedic trauma patients are emergency cases where management either conservative or surgical is absolutely necessary.

In our case, there was a grade II compound fracture of distal radius and ulna with fracture end protruding outside through the skin in right forearm while closed Frykman type VI distal radius fracture in the left forearm. Since this was a highly contaminated compound fracture, emergency debridement and an external fixator were urgently required. However, she was pregnant for seven months and hence sent for ultrasoundography that showed no fetal activities. Immediate obstetric intervention for evacuation of the dead fetus was performed by the second author followed by orthopedic intervention. Percutaneous K wires were removed 45 days after surgery while intramedullary ulnar K wire was replaced by the Titanium Elastic nailing. The wound was completely healed and functional outcomes were near normal with no obstetric complications three months after surgery.

4. Conclusion

Bilateral compound distal radius fracture during pregnancy is a very rare clinical problem. Meanwhile, this combination injury in the same individual during the second phase of COVID 19 National Lockdown is not only a challenging condition that requires multidisciplinary management but also requires life and limb saving judicial surgical intervention in the worst surrounding COVID environment. On this background, manual evacuation of dead fetus followed by closed reduction and percutaneous pinning after thorough debridement was the only option for this challenging case.

Declaration of patient consent

An informed consent was taken from the patient.

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Declaration of competing interest

None.

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