

Case Report

Management of neglected multiple lower limb fractures with vessel injury in second trimester antenatal patient – A rare case report

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Abstract

Lower limb fracture with vessel injury pregnant patients is rare and poorly discussed in the literature. In case of lower limb fractures with antenatal patient whether limb should be salvaged or amputated, if amputated whether baby should be delivered vaginally or by LSCS, keeping in mind the best possible outcome for both mother and her baby is still a gray area in orthopaedics parlance. We report a rare case of 28 year old antenatal patient who suffered from femoral and both bone leg fractures with vessel injury following road traffic accident which was managed with fracture stabilisation and amputation at knee level. Unfortunately wound got infected and daily EUSOL wash and ASDs were done and finally after five and half months baby was delivered vaginally and delivery was uneventful.

Keywords: Management, Multiple lower limb fractures, Vessel injury.

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Introduction

Trauma, affecting 7% of all pregnancies, is the leading cause of non-obstetric death in pregnant women and trauma during pregnancy places two life at risk[1,2]. Direct uterine and placental injuries are associated with a poor obstetric outcomes[3]. Orthopedic injury in pregnancy is an uncommon event, with most sources citing an incidence of 1–6%.[4,5] out of which femoral fractures in pregnancy has an incidence of approximately 1%.[6] When there is a fracture of the femur, the incidence of the injury of vascular structures is up to 0.1%–2.0%[7,8] so in pregnancy fracture femur with vessel injury is an extremely rare event (approximately 0.001%). The management of the pregnant trauma patient poses unique diagnostic and treatment challenges as the physiological and anatomical changes associated with pregnancy and the need to preserve fetal well-being create a number of nuances in the standard resuscitation algorithms[9]. Most reports of femoral fracture in pregnancy available throughout the English literature are either non traumatic fracture femoral neck due to pregnancy related osteoporosis or traumatic shaft of femur fracture by motor vehicle accident but none of these reports had an associated vascular injury with them[10].

We hereby report management of a rare case of 13th gestation week pregnant lady who sustained post-traumatic fracture shaft of femur of right/left side with femoral vessel injury. Informed written consent was taken from patient regarding use of her records for research and publication.

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Case Report

A 28 year primigravida woman in 13th week of gestation presented to the emergency department with history of Road Traffic Accident. On admission, her Glasgow Coma Scale Score was 15 and she was haemo-dynamically unstable. Her vitals were deranged [BP= 94/66 mm Hg, PR=104/min, Spo2=96% on room air, RR=24/min] at the time of presentation. She was transfused 3 crystalloid (2 Normal Saline, 1 Ringer Lactate) units, 1 colloid (hydroxyethyl starch) unit and 1 unit of whole blood. She was continuously monitored till her haemodynamic status stabilised. On general examination, she was pale. On local examination, there was pain, swelling and deformity in the right thigh, right knee and right leg with 5×3 cm lacerated wound on the posterior aspect of right knee, 2×2 cm lacerated wound on the anterior aspect of right knee, 12×6 cm lacerated wound on anteromedial aspect of right leg. Distal vessels were not palpable, no sensations were present below the knee with increased capillary refill time in the injured leg. Due to reasons unknown to us, patient and her attendants decided to leave the hospital against medical advice and they left. They came back after 2 days with bluish-black discoloration of leg with foul smelling wounds with no distal pulses palpable and asensate right leg and foot. Wounds were dirty with slough and necrotic patches over them. Mangled Extremity Severity Score (MESS) score was 8. Patient then decided to continue further treatment in our hospital only but the golden period was passed and revascularisation limb salvage surgery could not be done. On USG Color Doppler, monophasic flow was seen in popliteal artery, no flow was seen in dorsalispedis artery and posterior tibial artery. Plain film radiography demonstrated a AO 32A1 femur shaft fracture on right side. Obstetric team did evaluation of the fetus and detailed obstetrical examination. Per abdomen examination showed, fundal height corresponding to the gestational age, single, live fetus with regular fetal heart sounds at the rate of 140 beats/ minute. As

obstetrician advised, emergency CT angiography could only be done with risk of abortion and gross congenital malformation to the baby if pregnancy is continued. Since limb had already developed gross ischaemic changes, CT angiography was deferred. Preoperative planning was done and it was decided to fix the femur fracture with intramedullary nail and amputation at a level above the line of colour demarcation. Fracture shaft of femur was internally fixed with intramedullary kuntscher nail. According to the line of demarcation of colour changes, knee disarticulation was done, femoral condyles

were shaved, bone was covered with muscles and skin was given loose sutures. Unfortunately in post-operative period wound got infected. It developed slough and muscle sutures became loose. Sequential wound debridement and EUSOL wash was then done on daily basis and wound condition began to improve. Patient was then discharged and was advised regular antiseptic dressing with obstetric and orthopaedic follow up. Baby was delivered at term by vaginal delivery and labour was uneventful, baby cried immediately at birth. At present, both mother and baby are well in health (Figure 1-11).



Fig 1: Preoperative anteroposterior radiograph of hip, thigh and knee showing right sided fracture of femur



Fig 2: Preoperative anteroposterior and lateral radiograph of right leg showing segmental tibia and fibula fracture



Fig 3: Clinical picture at the time of presentation.



Fig 4: Clinical picture on second day following injury at the time of re-presentation



Fig 5: EUSOL wash of the amputation stump wound being done



Fig 6: Anteroposterior post-operative radiograph of thigh showing Kuntschner nail in femur with amputation stump



Fig 7: Lateral post-operative radiograph of thigh showing Kuntschner nail in femur with amputation stump



Fig 8: At 1 month of regular EUSOL wash, amputation stump is red with granulation tissue with mild discharge

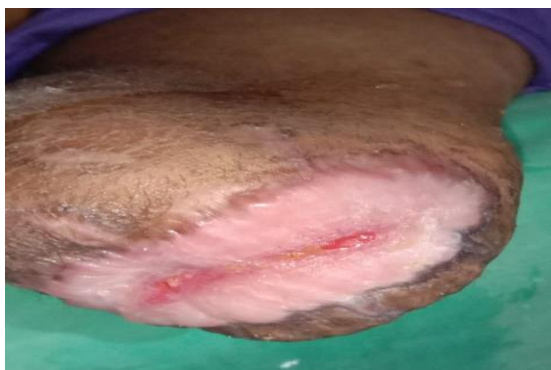


Fig 9: Wound status after 3 months



Fig 10: Healing wound at 4 months post injury

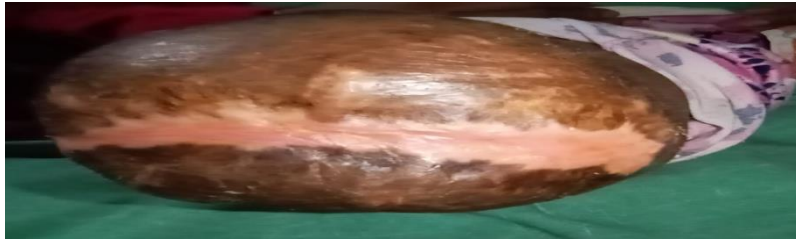


Fig 11: Mature amputation stump scar at 5 months post injury

Discussion

Trauma is the most common causative factor of non-obstetrical maternal death and resultant intrauterine fetal death. The most common etiology of trauma in pregnancy includes motor vehicle accident, fall, assault, and other injuries[11]. Harold et al reported Three cases of femoral fracture that occurred at 24, 30, and 31 weeks of gestation. The causes of femoral fracture were gunshot, motor vehicle collision, and fragility fracture respectively. All fractures were managed surgically and were uneventful. All patients underwent normal vaginal deliveries later on[6]. Sorbi et al reported a pregnant 41-year-old woman at 36 weeks' gestation who had a traumatic mid shaft displaced tibia and fibula fracture which was managed after five days of caesarean section with open reduction and internal fixation with pins and plates[12]. Bozkurt et al reported a case of 36 year old 36 weeks antenatal patient who suffered from fracture tibia and fibula following fall from stairs which was managed by intramedullary nailing. She had normal vaginal delivery at 40 weeks gestation. Both the events were uneventful[13]. On reviewing English literature, we found only a few reports of limb fracture during pregnancy[14-16] and this is the first known publication of femur, tibia and fibula fractures with vessel injury in an antenatal patient.

Limb salvage has been shown to result in an increased number of procedures and hospitalizations in addition to a higher rate of complications. In some cases, early amputation may provide the best functional result. In these cases, amputation should be thought of not as a failure but as an option that enhances the patient's functional capacity. However in our patient, limb salvage was not an option due to the presence of irreversible ischemic changes at the time of representation and for similar reasons and due to the antenatal status of the patient, CT angiography was not done. Furthermore, a kuntscher nail was preferred over an interlocking nail because Review of literature revealed no robust data regarding which anaesthetic route should be undertaken for non-obstetric surgery in a pregnant patient. Inhaled general anaesthetic agents have not been found to be teratogenic at the levels given for surgery but have been associated with increased risk of preterm labour in the second trimester[17]. Data regarding the route of delivery in patients that have suffered a lower extremity fracture is lacking. Therefore to decrease the anaesthesia time, a kuntscher nail was used instead of intramedullary interlocking nail.

Conclusion

Pregnant patients with lower limb fractures and vessel injury with anemia, both maternal and fetal life are of utmost concern. In these cases Damage Control Orthopaedics must be used. In some cases, early amputation may provide the best functional result, it should be thought of not as a failure but as an option that enhances the patient's functional capacity. Operative time must be shortened to decrease the side effects of anaesthetic agents. When affected limb is amputated at knee level, femoral shaft fracture can be stabilised with K-nail as operative procedure is relatively short compared to interlocking nail and there will not be significant weight bearing on amputation stump.

EUSOL wash played an important role in coping up with infection and natural healing of the stump as skin grafting cannot be done on weight bearing areas.

References

1. Barraco RD, Chiu WC, Clancy TV. EAST Practice Management Guidelines Work Group. Practice management guidelines for the diagnosis and management of injury in the pregnant patient: the EAST Practice Management Guidelines Work Group. *J Trauma* 2010;69:211-4.
2. Fildes J, Reed L, Jones N. Trauma: the leading cause of maternal death. *J Trauma* 1992;32:643-5.
3. Rothenberger D, Quattlebaum FW, Perry JF Jr. Blunt maternal trauma: a review of 103 cases. *J Trauma* 1978;18:173-9.
4. Ali J, Yeo A, Gana TJ. Predictors of fetal mortality in pregnant trauma patients. *J Trauma* 1997;42:782-5.
5. Almog G, Liebergall M, Tsafir A, Barzilay Y, Mosheiff R. Management of pelvic fractures during pregnancy. *Am J Orthop (Belle Mead NJ)* 2007;36:153-9.
6. Harold JA, Isaacson E, Palatnik A. Femoral fracture in pregnancy: a case series and review of clinical management. *Int J Womens Health* 2019;11:267.
7. Fowler J, Macintyre N, Rehman S, Gaughan JP, Leslie S. The importance of surgical sequence in the treatment of lower extremity injuries with concomitant vascular injury: A metaanalysis. *Injury* 2009;40:72-6.
8. Howard PW, Makin GS: Lower limb fractures with associated vascular injury. *J Bone Joint Surg Br* 1990;72:116-20.
9. Weintraub AY, Leron E, Mazor M. The pathophysiology of trauma in pregnancy: A review. *J Mat Fet Neo Med* 2006;19:601-5.
10. Ferrer VA, Flores BC, González LS. Transient osteoporosis complicated by a subcapital hip fracture in pregnancy: a clinical case and a literature review. *Revespcirortop Traumatol* 2011; 55: 215-9.
11. D'Amico CJ. Trauma in pregnancy. *Top Emerg Med* 2002;24:26-39.
12. Sorbi F, Sisti G, Di Tommaso M, Fambrini M. Traumatic tibia and fibula fracture in a 36 weeks' pregnant patient: a case report. *Ochsner J*. 2013;13:547-9.
13. Bozkurt C, Sarikaya B. A surgical opinion in a 36-week pregnant with tibia fracture: intramedullary nailing. *J Orthop Case Rep* 2016;1
14. Singh PK, Shrivastva D, Paddalwar S, Shetty N, Raut V, Patnaik S, et al. Management of maternofetal emergency in shock with fracture of femur. *J Surg Tech Case Rep*. 2011;3:52-5.
15. Ogbemudia A, Enemudo R, Edomwonyi E. Closed interlocked nailing of a fractured femur without x-ray guide in first trimester pregnancy: a case report. *Int J Third World Med* 2006, 5.
16. Nkanta CA, Omole-Ohonsi A. Management of Bilateral Femoral Fractures in Pregnancy: A Case Report. *Nigerian J. Orthop Trauma* 2003;2:36-8.
17. Ogle JA. Improving web site performance using commercially available analytical tools. *Indian J Anaesth* 2010;468:2604-11.

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