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Cesarean section and osteosynthesis of lower limb fractures in the same surgical procedure☆

Andre Wajnsztejn[a,*], Leandro Ejnisman[b], Eduardo Zlotnik[b], Luiz Roberto Zitron[b], Benno Ejnisman[a], Moises Cohen[a]

[a] Federal University of Sao Paulo, Brazil
[b] University of Sao Paulo, Brazil

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ABSTRACT

INTRODUCTION: Orthopedic trauma during pregnancy can cause serious complications such as premature birth, stillbirth and maternal morbidities.
PRESENTATION OF CASE: We report the case of a patient at 38 weeks pregnancy who fractured the left ankle and the right fifth metatarsal after falling. Cesarean section and osteosynthesis were performed in the usual manner in the same surgical procedure. There were no postoperative complications.
DISCUSSION: Pregnancy and puerperium are associated with a hypercoagulable state. The early mobilization provided by surgical treatment of the fractures reduced the risks of thromboembolic events.
CONCLUSION: The approach adopted may be used as an example for future procedures done in similar situations.
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1. Introduction

Ankle and foot fractures are very common. The estimated annual incidence for ankle and for foot fractures is between 13.1 and 14.6, and 11.9 and 22.7, per 10,000 women, respectively.[1,2] On the other hand, fractures in pregnancy are relatively rare. As reported previously,[3] out of 1055 pregnant trauma victims attending a level I trauma center over a 12-year period, only 65 (6%) had some type of orthopedic injury. Orthopedic trauma during pregnancy, even those low-energy, can cause serious complications such as premature birth, stillbirth and maternal morbidities.[3]

The purpose of this paper was to describe a cesarean section and osteosynthesis of the left ankle and of the right fifth metatarsal bone in a single anesthesia procedure, as well as the evolution of patient condition and of her child.

2. Presentation of case

A healthy 34-year-old primigravida at 38 weeks of gestation was victim of a sprained left ankle and a right foot after falling from a three-step ladder. She was admitted to the emergency room of our hospital with pain and lower limb functional disability, and abdominal discomfort.

In obstetric ultrasound, fetal biometry was consistent with 37 weeks of gestation and fetal growth was appropriate for gestational age. Doppler velocimetry of umbilical artery was normal. Radiographs showed fractures of the left lower ankle and of the base of the right fifth metatarsal (Figs. 1 and 2). No signs of osteoporosis were observed on radiographs.

When we take in consideration each fracture separately, they were amenable to non-operative treatment. However, a bilateral lower limb fracture in a pregnant woman would lead to a non-acceptable risk of thromboembolic event in our opinion. Surgery was performed with the goal of diminished time of immobilization, which we believe would add confort to the patient and lessen the risk of thrombosis.

Given the full-term pregnancy and the high risk of thromboembolic events in a pregnant patient with bilateral lower limb imobilization, cesarean section was indicated. Since the patient would be subjected to anesthesia, the orthopedic procedure was to perform osteosynthesis of the lower limbs together with the cesarean. The left ankle fracture was treated by plate and screw osteosynthesis, and the right fifth metatarsal was fixed with lag screw. The child was born in good general condition, weighing 3.2 kg (7.05 lb), requiring routine neonatal care.

Mechanical thromboembolic prophylaxis consisted of elastic stockings and active physical therapy, and the chemical prophylaxis consisted of low-molecular-weight heparin for 21 days after surgery. From the second postoperative day, the patient remained with no immobilization, and without load. After the sixth week, load deambulation was allowed. After 4 months, complete consolidation of fractures was observed (Figs. 3 and 4), and the patient was asymptomatic.

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* Corresponding author. Tel.: +55 11983264765; fax: +55 1121519394.
E-mail addresses: andre.epm@gmail.com, andrewaj@einstein.br (A. Wajnsztejn).

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Fig. 1. Left ankle X-ray (AP view) showing a lateral malleolus fracture.

The newborn was exclusively breastfed until 4 months of life, and showed no complications associated with trauma.

3. Discussion

We describe a female patient aged 34 who fractured the left ankle and the right fifth metatarsal in her last trimester of pregnancy. Cesarean section, plate osteosynthesis of left ankle, and traction-screw osteosynthesis of the right fifth metatarsal were performed in the same anesthesia procedure. Mechanical

Fig. 2. Right foot X-ray (oblique view) demonstrating a fifth metatarsal fracture.

Fig. 3. Four months post-operative X-ray showing consolidation of left ankle fracture.

Fig. 4. Four months post-operative X-ray showing consolidation of right foot fracture.

and chemical antithrombotic prophylaxes were performed. Cast was removed on the second postoperative day, and active physical therapy without load was initiated.

Important changes in body composition occur during pregnancy. The weight increases and the joints become more mobile. There may be an increased demand placed on hip abductor, hip extensor, and ankle plantar flexor muscles during walking, to compensate for the changes in body weight distribution.[4] Such changes in body balance, together with ligamentous laxity may explain the fall of the patient after performing a bilateral sprain mechanism.

The patient had a type B left ankle fracture, according to Danis–Weber classification.[5] A medial clear space of more than 4 mm on stress radiograph on Danis–Weber type B fractures indicate that the ankle fracture is unstable and need an open reduction and internal fixation.[6] The fifth metatarsal fracture occurred in zone 1, according to Lawrence and Botte.[7] Zone 1 fracture is usually stable because of the bone attachment to the plantar aponeurosis. Surgery is indicated if patient is intolerant to use cast.[7] If considered isolated, the ankle and the fifth metatarsal fractures could be treated non-surgically. There is no absolute indication for surgical treatment of bilateral lesions of the lower limbs, but we performed bilateral osteosynthesis as early as possible to shorten the use of cast. If we delayed surgical treatment of the fractures, the final result of fracture osteosynthesis could be jeopardized because of early soft callus formation, which occurs 2–3 weeks post-fracture.

Pregnancy and puerperium are associated with a hypercoagulable state,[8] in which several coagulation factors are increased (such as factor VII and VIII, von Willebrand factor, and fibrinogen).[9] In the case presented, we think that if orthopedic surgical treatment was performed and pregnancy was not terminated would lead to a high risk of thromboembolic events. Therefore, cesarean section and orthopedic procedures were performed in a single anesthesia procedure in order to proceed with early mobilization which reduces the risks of thromboembolic events.

During lactation, approximately 300–400 mg of calcium are lost in breast milk daily.[10] This demand is met by increased resorption of calcium from the bone, not by resorption from the kidneys. After the period of lactation, bone resorption due to pregnancy and lactation is readily reversed in healthy patients.[11] We did not observe changes during fracture consolidation in the case here reported.

A case of a pregnant woman who suffered spontaneous bilateral femoral neck fractures due to transient osteoporosis of pregnancy has been previously reported.[12] The lesions in patients with transient osteoporosis of pregnancy are atraumatic and present radiographic features characteristic of osteoporosis, unlike the case reported in our study.

Traumatic fracture of the tibia and fibula in a pregnant woman was described in 2008 by Bharathan et al.[13] After an initial conservative treatment with unsatisfactory reduction of the fractures, definitive osteosynthesis and cesarean section were performed in the same occasion as a combined surgical procedure. Prokop[14] in a revision paper about trauma in the last trimester of pregnancy suggests any accident-related surgery on the mother can be undertaken simultaneously to the cesarean section.

Despite the physiological changes associated with lactation, the healing time of fractures was similar to that of nonpuerperal patients. Although rare, orthopedic injuries in pregnant women could be associated with serious complications. The surgical approach reported in this study had a satisfactory outcome, and may be used as a guide for future procedures.

4. Conclusion

We described an unprecedented combination of osteosynthesis of the ankle and of the fifth metatarsal in the same surgical procedure of a cesarean section. The surgical approach provided good functional outcomes, minimizing the risks for thromboembolic events. Recovery time was reduced and the child was born safely.

Conflict of interest

None.

Funding

None.

Ethical approval

Patient consent had been obtained.

Author contributions

Andre Wajnsztejn, Leandro Ejnisman, Benno Ejnisman and Moises Cohen are orthopedic surgeons. Eduardo Zlotnik and Luiz Roberto Zitron are obstetrician. Leandro Ejnisman made data collection. Moises Cohen contributed towards study design and revision, but did not write. Andre Wajnsztejn remained the main author and others, such as Eduardo Zlotnik, Luiz Roberto Zitron, Benno Ejnisman, and Leandro Ejnisman helped the main author in writing.

References

1. Van Staa TP, Dennison EM, Leufkens HG, Cooper C. Epidemiology of fractures in England and Wales. *Bone* 2001;**29**(6):517–22.
2. Yang NP, Chan CL, Yu IL, Lee CY, Chou P. Estimated prevalence of orthopaedic fractures in Taiwan – a cross-sectional study based on nationwide insurance data. *Injury* 2010;**41**(12):1266–72.
3. Cannada LK, Pan P, Casey BM, McIntire DD, Shafi S, Leveno KJ. Pregnancy outcomes after orthopedic trauma. *J Trauma* 2010;**69**(3):694–8 [discussion 698].
4. Foti T, Davids JR, Bagley A. A biomechanical analysis of gait during pregnancy. *J Bone Joint Surg Am* 2000;**82**(5):625–32.
5. Weber BG. *Die verletzungen des oberen sprunggelenkes*. 2nd ed. Bern, Switzerland: Huber; 1972.
6. McConnell T, Creevy W, Tornetta P3rd. Stress examination of supination external rotation-type fibular fractures. *J Bone Joint Surg Am* 2004;**86-A**:2171–8.
7. Lawrence SJ, Botte MJ. The Jones fracture and related fractures of the proximal fifth metatarsal. *Foot Ankle* 1993;**14**:358–65.
8. Eldor A. Thrombophilia, thrombosis and pregnancy. *Thromb Haemost* 2001;**86**:101–4.
9. D'Uva M, Di Micco P, Strina I, De Placido G. Venous thromboembolism and pregnancy. *J Blood Med* 2010;**1**:9–12.
10. Kovacs CS, Kronenberg HM. Maternal–fetal calcium and bone metabolism during pregnancy, puerperium, and lactation. *Endocr Rev* 1997;**18**(6):832–72.
11. Mahadevan S, Kumaravel V, Bharath R. Calcium and bone disorders in pregnancy. *Indian J Endocrinol Metab* 2012;**16**(3):358–63.
12. Csotye J, Sisak K, Bardocz L, Toth K. Bilateral spontaneous displaced femoral neck fractures during pregnancy. *J Trauma* 2010;**6**(May (85)):E115–6.
13. Bharathan R, Duckett J, Jain S. An unusual indication for caesarean section: lower limb fracture. *J Obstet Gynaecol* 2008;**28**(August (6)):648–9.
14. Prokop A, Swol-Ben J, Helling HJ, Neuhaus W, Rehm KE. Trauma in the last trimester of pregnancy. *Unfallchirurg* 1996;**99**(June (6)):450–3 [article in German].

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