International Journal of Case Reports in Orthopaedics

E-ISSN: 2707-8353
P-ISSN: 2707-8345
IJCRO 2024; 6(1): 85-88
www.orthocasereports.com
Received: 01-02-2024
Accepted: 05-03-2024

Dr. Diouf Pape Alkaly
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University Dakar, Senegal

Dr. Gueye Khalifa Ababacar
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University, Dakar, Senegal

Dr. Keita Fodé Ibrahima Kourala
Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University, Conakry, Guinea

Dr. Diop Badara
Gaston Berger University, Saint- Louis, Senegal

Dr. Diallo Khadidiatou
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University, Dakar, Senegal

Dr. Bangoura Mouhamed
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University, Dakar, Senegal

Dr. Sané André Daniel
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University, Dakar, Senegal

Corresponding Author:
Dr. Diouf Pape Alkaly
Faculty of Medicine, Pharmacy and Odontostomatology, Cheikh Anta Diop University Dakar, Senegal

Management of a trochanteric fracture in progressive pregnancy in a precarious environment: A case report and literature review

Dr. Diouf Pape Alkaly, Dr. Gueye Khalifa Ababacar, Dr. Keita Fodé Ibrahima Kourala, Dr. Diop Badara, Dr. Diallo Khadidiatou, Dr. Bangoura Mouhamed and Dr. Sané André Daniel

DOI: https://doi.org/10.22271/27078345.2024.v6.i1b.196

Abstract
Pregnancy traumas are common, with an annual incidence between 5% and 8%. We report a case of right trochanteric fracture associated with a burn of the left lower limb in an eight-month pregnant woman treated at the Ziguinchor Regional hospital center in Senegal. A 23-year-old woman with no previous medical or surgical history was presented with right hip trauma and burns to the anterior aspect of left thigh. Occurred following the collapse of a kitchen built of clay. The patient had an 8-month, poorly followed, progressive pregnancy. X-rays showed a right inter-trochanteric fracture and a glimpse of the fetal head. Obstetrical ultrasound revealed an evolving intrauterine mono-fetal pregnancy of 36 weeks of gestation and 6 days. The patient was admitted for observation with glued traction of the fractured limb. On the 30th day of hospitalization, the patient developed a high fistula resulting in clear fluid loss, and delivered vaginally the following day with uncomplicated delivery. On the 48th day of hospitalization, she underwent DHS screw-plate hip surgery. Eight months after, the patient is walking independently. She complains of no pain and has good hip mobility. X-rays show bone consolidation and osteosynthesis material in place. Each step in the management of pregnancy trauma must be carefully codified and discussed according to the type of treatment, the age of the pregnancy and the vitality of the fetus, in order to avoid complications during pregnancy and childbirth, and any repercussions on the health of the newborn.

Keywords: Pregnancy, rockslide, fracture, burn, precariousness

Introduction
Pregnancy-related trauma is common, with an annual incidence between 5% and 8%, i.e. one pregnancy in 12 [1, 2].
Motor vehicle accidents are the most frequent cause (33.6%). Other causes include domestic violence and falls [1, 2].
They cause maternal mortality of around 10-20% and fetal mortality of 60-82% [2].
Management of these patients is multidisciplinary, involving the orthopedist, obstetrician, radiologist, intensive care anesthetist and neonatologist.
We report a case of right trochanteric fracture associated with a burn of the left lower limb in an eight-month-old pregnant woman treated in our hospital.
It is a center with a trauma department and an operating theatre that has neither an image intensifier nor an orthopedic table.

Case report
A.W., 23-year-old housewife, (gravida 3, para 2) with no reported medical or surgical history, received on September 03, 2020 at 2e hour of a right hip trauma and a burn of the anterior aspect of left thigh.
She is said to have been the victim of the collapse of a kitchen built of clay bricks following heavy rain. When the wall collapsed, she was splashed by the hot contents of a cooking pot and fell on her right side.
On reception, her consciousness was clear, her mucous membranes coloured and anicteric. She showed no signs of dehydration or malnutrition. Her calves were supple. Her blood pressure was 100/70 mm Hg. Pulse rate was 116 beats/min. Temperature was 37°2 Celsius.

There was a 2nd degree superficial burn involving the anterior aspect of the left thigh. This burn was estimated at 5% according to Wallace's rule.

The right lower limb was shortened, adducted and externally rotated. Clinostatism was positive, with exquisite pain over the greater trochanter. There were no vasculo-nervous disorders distally.

The patient presented with a poorly followed progressive pregnancy of 8 months.

Obstetrical examination revealed normal-looking breasts and a positive colostrum rise. The abdomen was soft, with an ovoid uterus with a long longitudinal axis, and a uterine height of 31 cm. Active fetal movements were present, with the head oriented downwards and the back to the right. Fetal heart rate was 147 beats/minute. Vaginal examination revealed a posterior, mid-long, soft, dehiscent cervix with mobile cephalic presentation.

X-rays of the pelvis and right hip in front and in profile showed a right inter-trochanteric fracture and a glimpse of the fetal head (Fig 1). Obstetrical ultrasound showed an evolving intrauterine mono-fetal pregnancy of 36 days and 6 days. The expected date of delivery was October 28, 2020.

The patient's blood group was OO RhD positive. Hemoglobin was 11.9 g/dl. White blood cell count was 6.7 g/l. Hyperplateletosis was noted at 467 g/l. Blood crase was normal.

The patient was admitted for observation with glued traction of the fractured limb. She was treated with analgesics, low-molecular-weight heparin (LMWH) anticoagulants in preventive doses, and vaginal antibiotics. Pre-conception and pregnancy supplements were also introduced. Special management of the burn required silver sulfadiazine dressings every 2 days.

Fig 1: X-ray of the pelvis, showing a right intertrochanteric fracture and the fetal head in the lesser pelvis

On the thirtieth day of hospitalization, the patient developed an upper fistula with clear fluid loss, and gave birth the following day by vaginal delivery, with a simple delivery. The baby weighed 3.2 kg and measured 48 cm.

She underwent hip surgery at D_{48} (18 days after delivery). Using the Watson-Jones approach, the fracture was reduced and fixed with a DHS screw-plate (fig 2). The burn progressed well.

Fig 2: Postoperative face/profile X-rays

At D_{60} post-op and D_{78} post-partum, the patient was in good general condition, walking with support protected by English canes, and her child was well.

Eight months after the operation, the patient is walking independently. She has no pain complaints and good hip mobility. X-rays show bone consolidation and osteosynthesis material in place (fig 3).

Fig 3: X-rays eight months after surgery

Discussion

Morphological changes during pregnancy put both mother and fetus at greater risk of trauma. The risk of trauma increases with the age of pregnancy. According to studies by Curet [3], this risk is 10% to 15% in the first trimester, 32% to 40% in the second, and 50% to 54% in the third, as was the case with our patient. Falls rank 3e among the causes, between 9 and 22% of cases, behind traffic accidents and domestic violence [1, 2]. However, the circumstance of a rock-slide in a kitchen built of clay is exceptional.

Fractures in pregnant women are often atraumatic and attributed to osteoporosis or algodystrophy [4]. In our patient, trauma was probably the only incriminating cause, given the absence of radiological signs in favor of osteoporosis or algodystrophy.

Minor burns (less than 10%) in pregnant women, as in our patient's case, rarely pose a threat to maternal and fetal well-being [5]. However, superinfection of the wound is to be avoided, as it could alter the prognosis.

The orthopedic surgeon is often faced with a dilemma when faced with a musculoskeletal trauma in a pregnant woman: whether to perform an X-ray, a CT scan or any other exposure to X-rays.

It is well known that exposure to ionizing radiation in utero can have harmful teratogenic or carcinogenic consequences on the development of the embryo and/or fetus [2, 6, 7].

The teratogenic and carcinogenic action of ionizing radiation on the fetus is proportional to the dose, duration of exposure and age of pregnancy. The degree of exposure depends on the imaging protocol, the equipment used, the dose delivered and the distance separating the fetus from the territory explored [7].

On average, we receive 30 mGy of radiation per year [2]. A fetus receives between 5 and 10 mGy of radiation during a normal pregnancy, i.e. 3 to 6 times less than the mother, due to the protection afforded by maternal tissues, which attenuate the doses [2].

Ionizing radiation doses below 100 mGy can cause complications ranging from abortion in the first 2 weeks of amenorrhea ("all-or-nothing period" Wang) to psychomotor retardation around 17th weeks of amenorrhea. However, beyond 17th weeks, the teratogenic risk is negligible, especially for diagnostic doses often below 50 mGy on the fetus [2, 6].

However, the carcinogenic risk remains less well defined. According to the International Commission on Radiological Protection, the carcinogenic risk for exposure to 30mGy is 0.2% [2].

X-rays of the pelvis and right hip in profile were taken in our patient using a standard X-ray machine. According to studies by Jain and Matson, fetal exposure following these examinations delivers between 0.4 and 2.4 mGy of X-rays for a pelvis X-ray and 0.51 to 3.7 mGy for a hip X-ray. This means that our patient's fetus would be exposed to a maximum overall dose of 6.1 mGy, which given the pregnancy's age of 36th weeks of amenorrhea is negligible. However, a CT scan should only be performed when unavoidable, as it delivers up to 45m Gy to the fetus [2, 6].

Drugs prescribing must be undertaken with a degree of caution, due to the possible risk to the foetus. However, when faced with certain clinical situations, the use of medication becomes more than necessary. Second-degree burns provide an entry point for germs, thus administration of local or general antibacterials is essential. Locally, fusidic acid and mupirocin are the first-line treatments for staphylococcal and streptococcal skin infections during pregnancy. On the other hand, povidone-iodine (yellow Betadine), applied to injured skin after 12th weeks of amenorrhea, can cause iodine overload in the fetus, leading to fetal hypothyroidism and neonatal goiter [8]. Systemic use of cephalosporines, macrolides and penicillins, with or without beta-lactamase inhibitors (clavulanic acid, tazobactams), can be considered regardless of the term of pregnancy. However, clavulanic acid is not recommended for women in labour, as it increases the risk of ulcerative colitis. Glycopeptides (vancomycin) are not recommended due to the potential risk of ototoxicity and nephrotoxicity [16]. Quinolones are only indicated in the second line, or if the antibiogram indicates due to the risk of damage to fetal cartilage, while tetracyclines are contraindicated due to the risk of dental dyschromia [9]. In our patient, we administered ampicillin at a dose of 1 gram 3 times daily.

Pregnancy increases the risk of venous thromboembolism during gravidol puerperium. Fractures of the lower limbs, with the sedentary lifestyle they entail, are added risk, and make prevention of this pathology mandatory. Such prevention essentially involves the administration of anticoagulants. However, the use of anti-vitamin K is generally prohibited throughout pregnancy, due to the risk of teratogenicity and bleeding [10]. Several malformations affecting the face, skeleton and central nervous system have been described in cases of first-trimester use, as well as fetal loss, prematurity and fetal or placental hemorrhage in cases of second- and third-trimester use [10].

Most guidelines recommend low-molecular-weight heparins (enoxaparin, dalteparin) as first-line preventive treatment after the first trimester. For curative treatment, calciparin (unfractionated heparin) is indicated as first-line therapy whatever the trimester of pregnancy, as shown by the latest recommendations of the American College of Chest Physicians [11]. The occurrence of complications associated with UFH (heparin-induced thrombocytopenia or allergy) justifies substitution with LMWH [11].

In all cases, treatment is discontinued as soon as labor begins in the case of prophylactic treatment, and 24 hours before delivery in the case of curative treatment. Neonatal monitoring includes a blood count and hemostasis test (anti Xa activity).

Non-obstetric surgeries in pregnant women are delicate, but not uncommon: 1.5% to 2% in the USA [12, 13]. They are a source of anxiety for both the surgeon and the mother. However, the fetal risk is very real, as they can lead to abortion in the 1er trimester, premature delivery or low birth weight in the 3e trimester. However, these complications are attributable to the surgery itself and not to the anesthetic products [12].

In fact, anesthetic drugs do not cross the placental barrier, and no study has proven the existence of a fetal risk associated with local or general anesthetics, analgesics or benzodiazepines. No anesthetic agent is recognized as teratogenic in humans [13]. The anesthetic challenge will therefore be to ensure the mother's hemodynamic stability in order to maintain good uteroplacental perfusion [13].

The problem in our case was linked to the surgical technique, which involved placement with a guide wire in the femoral neck. This is possible if done under scopic control. However, in the absence of an image intensifier, the procedure is performed blindly, which was not feasible in

our patient's case prior to delivery, given the age of the pregnancy, as such an uncontrolled procedure could result in serious trauma to the fetus.

As our patient was in her 3rd pregnancy, and her fracture was more than a month old and not very painful, she gave birth by vaginal delivery with her left lower limb spread. A Caesarean section had been planned in case of any difficulties encountered during the vaginal delivery.

Conclusion

Pregnancy-related trauma is a frequent occurrence, and its management is multidisciplinary, often requiring investigation, medication and sometimes surgery. However, each step must be carefully codified and discussed according to the type of treatment, the age of the pregnancy and the vitality of the fetus, to avoid complications during pregnancy and delivery, and any repercussions on the health of the newborn.

References

1. Jain V, Chari R, Maslovitz S, Farine D, Bujold E, Gagnon R, *et al*. Guidelines for the Management of a Pregnant Trauma Patient. J Obstet Gynaecol Can. June 2015;37(6):553-571.
2. Matzon JL, Lutsky KF, Ricci EK, Beredjiklian PK. Considerations in the Radiologic Evaluation of the Pregnant Orthopaedic Patient: J Am Acad Orthop Surg. august 2015;23(8):485-491.
3. Curet MJ, Schermer CR, Demarest GB, Bieneik EJ, Curet LB. Predictors of Outcome in Trauma during Pregnancy: Identification of Patients Who Can Be Monitored for Less than 6 Hours: J Trauma Inj Infect Crit Care. july 2000;49(1):18-25.
4. Gouin F, Maulaz D, Aillet G, Pietu G, Passuti N. Femoral neck fracture complicating hip algodystrophy during pregnancy. About 2 observations. Rev Chir Orthopédique Réparatrice Appar Mot. 1992;78(0001):00045-50.
5. Mabogunje OA. Burn Injuries During Pregnancy: An African Series. J Natl Med Assoc. 82(9):4.
6. Groen RS, Bae JY, Lim KJ. Fear of the unknown: ionizing radiation exposure during pregnancy. Am J Obstet Gynecol. June 2012;206(6):456-462.
7. Wang PI, Chong ST, Kielar AZ, Kelly AM, Knoepp UD, Mazza MB, *et al*. Imaging of Pregnant and Lactating Patients: Part 1, Evidence-Based Review and Recommendations. Am J Roentgenol. Apr 2012;198(4):778-784.
8. Heinonen OP, Slone D, Shapiro S. Evaluation of drugs in relation to malformations which may originate during early or late embryogenesis. In: Birth Defects and Drugs in Pregnancy. Publishing Sciences Group, Littleton, MA; c1997. p. 442.
9. Bar-Oz B, Moretti ME, Boskovic R, O'Brien L, Koren G. The safety of quinolones-a meta-analysis of pregnancy outcomes. Eur J Obstet Gynecol Reprod Biol. 2009;143(2):75-78.
10. Van Driel D, Wesseling J, Sauer PJ, Touwen BC, Van Der Veer E, Heymans HS. Teratogen update: fetal effects after in utero exposure to coumarins overview of cases, follow-up findings, and pathogenesis. Teratology. 2002;66(3):127-140.
11. Bates SM, Greer IA, Pabinger I, Sofaer S, Hirsh J. Venous thromboembolism, thrombophilia, antithrombotic therapy, and pregnancy: American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2008;133(6):844S-886S.
12. Melnick DM, Wahl WL, Dalton VK. Management of general surgical problems in the pregnant patient. Am J Surg. Feb 2004;187(2):170-180.
13. Kuczkowski KM. Nonobstetric Surgery During Pregnancy: What Are the Risks of Anesthesia: Obstet Gynecol Surv. janv 2004;59(1):52-56.

How to Cite This Article

Alkaly DP, Ababacar GK, Kourala KFI, Badara D, Khadidiatou D, Mouhamed B, *et al*. Management of a trochanteric fracture in progressive pregnancy in a precarious environment: A case report and literature review. International Journal of Case Reports in Orthopaedics. 2024;6(1):85-88.