

Successful treatment of a hip fracture in a 108 years old patient a case report

Abstract

Introduction: Old age population is increasing around the world. Femur and hip fractures require surgical treatment. We present a case of a patient aged 108 years, with a hip fracture and after surgical treatment was sent home in 24 hours.

Case Report: Female, 108 years old, in Hospital for a correction of a neck fracture of her femur and anaemia. Echocardiogram revealed ejection fraction of 66% and a light mitral insufficiency. ECG presented sinus bradycardia. All other exams were within normal range. In the previous day she received two units of hematis and revealed the following results: Hm = 3,890,000, Hb = 11.2 g/L and Ht = 32.8%. Two hour before the surgery the patient received 200 mL of a meal supplement containing a high power energetic and a high quality protein. Lumbar and inguinal plexus block were placed with a neurostimulator (HNS12) and an insulated needle of appropriate length. 20 mL of levobupivacaine 0.5% and 20 mL of lidocaine at 2% with epinephrine 1:200.000 were injected. The patient was monitored with ECG, non invasive arterial pressure and SpO₂. Reposition was placed with crystalloid and hidroxyethylamide (130/0.4) at 6%. After sedation with 0.5 mg of midazolam, subarachnoid puncture was placed in the sitting position at L3L4 and 7.5 mg of 0.5% isobaric bupivacaine were administered. Sensory block reached T12. The procedure was concluded in 40 minutes without any important hemodynamic variation. The patient was released home in the morning of the second day, lucid, oriented, and pain free.

Conclusion: This case shows us that with adequate procedures a 108 years old patient can be operated and go back home in two days.

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Luiz Eduardo Imbelloni,¹ Alexandre A Galvão,² Jorge Augusto C Santos,² Lonardo Coura³

¹Professor of Anesthesiology, School of Medicine Nova Esperança, Anesthesiologist Complexo Hospitalar Mangabeira, Brazil

²Ortopedista do Complexo Hospitalar Mangabeira Gov. Tarcisio Burity, Brazil

³Residente de Anestesiologia do CET-SBA, Brazil

Correspondence: Luiz Eduardo Imbelloni, Professor of Anesthesiology, School of Medicine Nova Esperança, Anesthesiologist Complexo Hospitalar Mangabeira, Rua Marieta Steimbach Silva, 106/1001, Cabo Branco, 58043-320 □ João Pessoa, PB, Brazil, Email dr:imbelloni@terra.com.br

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Introduction

Globally, the population of the elderly increases at a high rate. As life expectancy increases, so increases the number of very old patients for surgery. More and more they reach a centenary anniversary. In the year 2012 there were over 30,000 citizens above 100 years old.¹ Femur fractures are very common in the elderly because of the osteoporosis and are normally treated surgically to improve a faster rehabilitation.² The rate of surgical intervention in this group has also increased, even in nonagenarians and centenarians.³ Despite the good health condition necessary to reach this age, the function of various organs will deteriorate, making homeostasis easily compromised, and any stress situation, such as trauma or a surgery, may lead to an organ dysfunction or worsen what exists.⁴ Recently it was related a case of a 107 years old patient that was operated of a hip fracture that was discharged two days after the surgery, as part of the project ACERTO (ESRA in Europe).⁵ So, the present case report the success of an anesthesia and a surgery for a left hip fracture repair in a patient 108 years old.

Case report

After written informed consent for anesthesia and publication, a female patient 108 years old, 1.43m high, 45 kg, ASA III, BMI 22.05 kg.m⁻², scheduled for a surgery of her left hip presented anemia (Hm = 3,030,000, Hb = 8,8 g/L e Ht = 27,7%) that was corrected before the surgery. We obtained informed consent and discussed the anesthetic technique with the patient and family. Her clinical history revealed arterial hypertension and use of tobacco. At physical evaluation she exhibited a holosystolic blow (2+/4+) in the aortic and mitral focus. The echocardiogram revealed the aortic valves area of 2.10 cm², peak

aortic transvalvar gradient 16.48 mmHg, ejection fraction 66% and a light mitral valve insufficiency. The electrocardiogram (ECG) revealed sinus bradycardia. Other exams as clotting time, renal function, liver function were within normal range. There was no history of allergy to any drug.

The patient was transferred to the group of the project Acerto (Plataforma Brazil, CAAE: 09061312.1.000.5179) and included for surgical correction of the femur fracture (DHS). In the previous day she received two units of packed red and the results exhibited Hm = 3,890,000, Hb = 11.2 g/L e Ht = 32.8%. Two hours before being conducted to the OR she received orally 200 mL of a supplement containing a high energetic protein, without lactose and without gluten (Fresubin Jucy®). Soon after the ingestion of the supplement and still in the infirmary, she received a nerve block via the inguinal approach to provide analgesia through the lumbar plexus. A nerve stimulator (HNS12 B Braun, Melsungen) was used with an insulated needle of appropriate length (50 mm, 22G x 2") (B Braun Melsungen). The needle was advanced to the femoral nerve and the quadriceps was stimulated with a current of 0.5 mA exhibiting an excellent contraction. After a negative aspiration for blood, 20 mL of 0.5% levobupivacaine and 20 mL of 2% lidocaine with epinephrine 1:200.000 were injected through the connector of the needle.

In the operating room, she was continuously monitored with ECG (CM5), non invasive blood pressure equipment (PANI) and peripheral oxygen saturation (SpO₂). A peripheral vein was accessed through an 18G teflon catheter in the right arm to provide medication and hydration with crystalloid (4 mL/kg) and 500 mL of 6% hydroxyethyl starch (130/0,4) in sodium chloride at 0.9% (Voluven®). After sedation with midazolam (0.5 mg) intravenously, the patient

was seated for the block. The skin was prepared with 70% alcohol and the puncture was placed medially in the L4-L5 interspace with a 27G needle (Whitacre - B Braun Melsungen) with an introducer. After the appearance of liquor (CSF), 7.5 mg of isobaric bupivacaine 0.5% (Cristália Produtos Químicos Farmacêuticos Ltda) were administered at a speed of 1 mL.15s⁻¹. The patient was immediately placed recumbent for the beginning of the surgery. The sensory block level reached T₁₂. The procedure lasted 40 minutes, without hypotension, bradycardia, or hypoxia. Total recovery occurred at 90 minutes after the injection of the local anesthetic. Posteriorly, the patient was conducted to her infirmary, fully conscious, oriented and preserved vital signs. Arriving in her room, she received 200 mL of the same supplement used preoperatively (120 minutes after the spinal anesthesia). The analgesia provided by the inguinal approach of the lumbar plexus lasted 22 hours. The patient was discarded home in the morning of the second day postoperatively, aware, oriented, and pain free.

Discussion

The literature was reviewed and we found a case report of a patient 107 years old.⁵ This case was reviewed with success published with octogenarians, nonagenarians and centenarians.^{3,6,7} This case demonstrated that these patients have an excellent tolerance to anesthesia and surgery, as it was also observed by other authors.⁵⁻⁷ May be the most important fact of this case is that the 108 years old patient returned home with all her activities in the second day postoperatively, as a result of the project Acerto for the elderly.^{8,9}

A discussion with patient and family members about techniques and anesthetic risks and fasting time may reduce their anxiety.¹⁰ The preanesthetic evaluation also offers a good opportunity to reduce negative beliefs about anesthetic techniques such as spinal and regional anesthesia. Her preanesthetic evaluation and the explanation about all the process and the project to accelerate the postoperative recover permitted the surgical treatment with success in this 108 years old patient. Advances and improvement in the medical science has increased the life expectancy, and for that the anesthesia and the surgery in the elderly has turned to be such a very important matter.²⁻⁹ A femur fracture can cause over a liter of blood loss.¹¹ This fact was confirmed through the severe anemia of the patient at her arrival to the Hospital. The reposition with two units of concentrate permitted her inclusion in the project Acerto (Hb > 100 g/L) and to be operated in three days.⁹ With hemoglobin above the trigger,⁹ the surgery was placed with a 3 cm incision and no blood reposition per operatively or postoperatively was necessary.

Recently a logistic model to predict arterial hypotension during spinal anesthesia was published.¹² The predictive variables were age above 50 years, sensitive block above T₆, the use of 0.5% hyperbaric bupivacaine, BMI above 30 and opioid medication. More recently is was identified the use of spinal anesthesia, age above 60 years, female gender as predictive factors for arterial hypotension in a series of 32,554 patients.¹³

The lumbar plexus block through the inguinal via just before the surgery permitted to use a lower dose of isobaric bupivacaine (7,5 mg) and the reduction of the sensory block time. The reduction of the fasting time to two hours reflected in a cardio circulatory stability without hypotension. Studies with the elderly and hip fracture showed that lower doses of local anesthetics associated with opioid result in lesser incidence of hypotension as compared to the conventional doses.^{14,15} We prefer the use of low dose associated with the lumbar plexus block to prevent urinary retention, so common with the use of opioid.

The process of aging is deleterious and progressive and is associated to a variety of physiological factors that affect functional reserves, resulting in reduction of the capacity to respond to a stress attack. Despite her 108 years of age, the patient did not present clinical problems and she had laboratory data in the normal range, except the anemia caused by the fracture. The surgery in centenarians is not free of risk, although a number of reports have shown that it can be relatively safe.^{3,7}

The nutritional state of these patient before the procedure may play an important role in the result of the surgery.¹⁶ For this reason, the patient received a *meal* as a supplement two hour before the surgery and when she returned from the OR (2 hours). Normal meals started 6 hours post-operatively.⁹ The results of the study with nonagenarians and centenarians for orthopedic surgery of the femur demonstrated a relative low risk for mortality.³ The present patient 108 years old tolerated the surgery without any complication, being delivered to her residency in the second day postoperatively. The evaluation of the patient by the team that includes the anesthetist, orthopedic surgeon, nutritionist, the nurses, physiotherapist that work together in the project ACERTO demonstrates that the patient must be operated as soon as possible to be able to return home in the shortest time. The post-operative pain relief is mandatory for a good recovery and a fundamental necessity for the successful implantation of a project to accelerate the return home of the patient.^{17,18} So, the protocols of regional anesthesia must be developed and applied in all transoperative time. The inguinal fold is a very safe region with a low risk for lesion of vital structures, as the femoral artery is easily palpable and a guide for the lumbar plexus block by the anterior approach. The analgesia was placed by a lumbar plexus block through the anterior approach just before entering the OR, and it lasted for 22 hours, with a mixture of lidocaine plus epinephrine and levobupivacaine.

The maximal dose of lidocaine with epinephrine is recommended 7 mg.kg⁻¹.¹⁹ The lidocaine dose to reach plasma concentration of 5 µg.mL⁻¹ varies with the local of administration.²⁰ In 346 patients in which 900 mg were injected lidocaine plus epinephrine for brachial plexus block through a transarterial technique there were no case of intoxication.²¹ Another paper found a mean value of plasma concentration of 2.9 µg.mL⁻¹ after the use of 900 mg, with an individual value 5.6 µg.mL⁻¹, after the injection of 900 mg of lidocaine with a mean value of 18 mg.kg⁻¹.²² The recommended dose of bupivacaine is 2 mg.kg⁻¹, being it possible to reach 3 mg.kg⁻¹ of 0.5% of bupivacaine in patients receiving ciatic block or 3x1.²³ In this study we used lower doses of 0.25% bupivacaine. So, considering the low absorption rate of the lumbar plexus in the inguinal region and the relative small dose used, both drugs did not produce any harm to the patient. Advanced age has been traditionally considered a factor of risk for the elder surgery. In the beginning of the 20th century, people over 50 years were excluded of many procedures now considered minor. To live over 100 years is no longer a rarity and there exists over 30,000 centenarians in Brazil.¹ Surgery shall not be denied based only in their age. Medical evaluation must concentrate in the identification of risk factors, evaluating physical status, foreseeing complications, physical condition, preventing complications, providing information, anesthetist and geriatric. This case has shown that with adequate procedure orthopedic surgery may be applied in a 108 years old patient.

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Conflicts of interest

None.

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References

1. <http://g1.globo.com/bom-dia-brasil/noticia/2012/07/quase-30-mil-brasieiros-ja-passaram-dos-100-anos-de-idade-diz-ibge.html>. Acesso em 25/01/2016 <http://g1.globo.com/bom-dia-brasil/noticia/2012/07/quase-30-mil-brasieiros-ja-passaram-dos-100-anos-de-idade-diz-ibge.html.%20Acesso%20em%2025/01/2016>.
2. Cummings SR, Melton LJ. Epidemiology and outcomes of osteoporotic fractures. *Lancet*. 2002;359(9319):1761–1767.
3. Imbelloni LE, MoraisFilho GB, Silva A. Outcome after anesthesia and orthopedic surgery in patients nonagenarians and centenarians. *J Anesth Clin Res*. 2014;5: 411–415.
4. Rosenthal RA, Kavic SM. Assessment and management of the geriatric patient. *Crit Care Med*. 2004;32(Suppl 4): 92–105.
5. Imbelloni LE, Lima U, Pedrosa FK. Successful anesthesia and hip surgery in a 107-year-old patient. *Am J Case Rep*. 2014;15:308–311.
6. Forster MC, Calthorpe D. Mortality following surgery for proximal femoral fractures in centenarians. *Injury*. 2000;31(7):537–539.
7. Warner MA, Saletel RA, Schroeder DR, et al. Outcomes of anaesthesia and surgery in people 100 years of age and older. *J Am Geriatr Soc*. 1998;46(8):988–993.
8. Imbelloni LE, Teixeira DMP, Coelho TM, et al. Avaliação dos resultados da implantação de um protocolo de cuidados perioperatórios em pacientes submetidos à cirurgia ortopédica. *Rev Col Bras*. 2014;41(3):161–167.
9. Imbelloni LE, Gomes D, Braga RL, et al. Clinical strategies to accelerate recovery after surgery orthopedic femur in elderly patients. *Anesth Essays Res*. 2014;8(2):156–161.
10. Imbelloni LE, Pombo IAN, Morais Filho G. A diminuição do tempo de jejum melhora o conforto e a satisfação com anestesia em pacientes idosos com fratura de quadril. *Rev Bras Anesthesiol*. 2015;65:117–123.
11. Willett KM, Dorrell H, Kelly P. ABC of major trauma: management of limb injuries. *BMJ*. 1990;301(6745):229–233.
12. Tarkkila P, Isola J. A regression model for identifying patients at high risk of hypotension, bradycardia and nausea during spinal anesthesia. *Acta Anaesthesiol Scand*. 1992;36(6):554–558.
13. Pereira ID, Grando MM, Vianna PT, et al. Retrospective analysis of risk factors and predictors of intraoperative complications in neuraxial blocks at Faculdade de Medicina de Botucatu-UNESP. *Rev Bras Anesthesiol*. 2011;61(5):568–581.
14. Olofsson C, Nygard EB, Bjersten AB, et al. Low-dose bupivacaine with sufentanil prevents hypotension after spinal anesthesia for hip repair in elderly patients. *Acta Anaesthesiol Scand*. 2004;48(10):1240–1244.
15. Imbelloni LE, Braga RL, Morais Filho GB, et al. Low dose of isobaric bupivacaine provides lower incidence of spinal hypotension for hip surgery in elderly patients. *Anesth Pain & Intensive Care*. 2004;18(1):17–20.
16. Takeda S, Noji H, Hirose N, et al. Nutritional intake by the oldest elderly Japanese. Tokyo Centenarian Study. *Jpn J Geriatr*. 1998;35(7):548–58.
17. Kehlet H, Soballe K. Fast-track hip and knee replacement – what are the issues? *Acta Orthopaedica*. 2010;81(3):271–272.
18. Kehlet H, Wilmore DW. Evidence-based surgical care and the evolution of fast-track surgery. *Ann Surg*. 2008;248(2):189–198.
19. de Jong RH, Grazer FM. Perioperative management of cosmetic liposuction. *Plastic Reconstr Surg*. 2001;107(4):1039–1044.
20. Tucker GT, Mather LE. Properties, absorption and disposition of local anaesthetics drugs. IN: Cousins MJ, Briedenbaugh PO (Eds.), *Neural Blockade*. Lippincott, Philadelphia, USA. 1988:62–63.
21. Aantaa R, Kirvelä O, Lahdenperä A. Transarterial brachial plexus anesthesia for hand surgery: a retrospective analysis of 346 cases. *J Clin Anesth*. 1994;6(3):189–192.
22. Pälve H, Kiervälä O, Olin H, et al. Maximum recommended doses of lignocaine are not toxic. *Br J Anaesth*. 1995;74(6):704–705.
23. Misra U, Pridie AK, McClymont C, et al. Plasma concentrations of bupivacaine following combined sciatic and femoral 3 in 1 nerve blocks in open knee surgery. *Br J Anaesth*. 1991;66(3):310–313.