



## Original article

# 488 hand surgeries with local anesthesia with epinephrine, without a tourniquet, without sedation, and without an anesthesiologist<sup>☆</sup>



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## ARTICLE INFO

## Article history:

Received 7 February 2017

Accepted 6 April 2017

Available online 5 April 2018

## Keywords:

Epinephrine

Local anesthesia

Wrist

Hand

Finger

## ABSTRACT

**Objectives:** Evaluate the incidence of digital infarction and tissue necrosis using local anesthesia with 1% lidocaine and 1:100,000 epinephrine in wrist, hand, and fingers surgeries, without a tourniquet, without sedation, and without an anesthesiologist.

**Methods:** Patients with wrist, hand, and fingers disorders prospectively underwent surgery under local anesthesia with 1% lidocaine and 1:100,000 epinephrine. The primary outcomes evaluated were the presence of digital infarction and tissue loss due to necrosis. As secondary outcomes, the need for the use of sedatives, tourniquet, anesthesiologist assistance, or surgery suspension were evaluated.

**Results:** Fifty-three wrists, 307 hands, and 128 fingers were anesthetized with lidocaine and epinephrine without any complications related to epinephrine. There was no patient that presented with any of the primary or secondary outcomes.

**Conclusions:** Wrist, hand, and fingers surgeries can be safely performed with local anesthesia with 1% lidocaine and 1:100,000 epinephrine, without sedation, without a tourniquet, and without an anesthesiologist.

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<sup>☆</sup> Study conducted at Universidade Estadual Paulista (Unesp), Faculdade de Medicina de Botucatu, Botucatu, SP; Pontifícia Universidade Católica de Campinas (PUC-Campinas), Hospital e Maternidade Celso Pierro; Campinas, SP; and at Associação Beneficente Nossa Senhora do Pari, São Paulo, SP, Brazil.

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<https://doi.org/10.1016/j.rboe.2018.03.011>

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## 488 cirurgias da mão com anestesia local com epinefrina, sem torniquete, sem sedação e sem anestesista

### R E S U M O

*Palavras-chave:*  
Epinefrina  
Anestesia local  
Punho  
Mão  
Dedo

**Objetivo:** Avaliar a incidência de infarto digital e necrose tecidual com o uso de anestesia local com lidocaína a 1% e epinefrina a 1:100.000 nas cirurgias do punho, mão e dedos, sem torniquete, sem sedação e sem anestesista.

**Métodos:** Pacientes com afecções do punho, mão e dedos foram prospectivamente operados com anestesia local com lidocaína a 1% e epinefrina a 1:100.000. Os desfechos primários avaliados foram infarto digital e perda tecidual devido a necrose. Os desfechos secundários avaliados foram necessidade de sedação, torniquete, auxílio de anestesista ou suspensão da cirurgia.

**Resultados:** Foram anestesiados 53 punhos, 307 mãos e 128 dedos com lidocaína e epinefrina sem complicação relacionada à epinefrina. Nenhum paciente apresentou desfechos primários ou secundários.

**Conclusão:** Cirurgias do punho, mão e dedos podem ser feitas de forma segura com anestesia local com lidocaína a 1% e epinefrina a 1:100.000, sem sedação, sem torniquete e sem médico anestesista, com segurança.

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## Introduction

The practice of outpatient hand surgery, which aims at reducing costs and increasing the convenience of patients who do not need hospitalization, has stimulated the use of local anesthesia; the method of controlling the discomfort of the most commonly used method, the tourniquet, is sedation.<sup>1</sup> However, safe sedation requires the presence of an anesthesiologist; it hinders the patient's collaboration, mainly in repair surgeries and tendon transfers; it increases the risk of systemic complications, especially in patients over 65 years; and it delays hospital discharge.<sup>2</sup>

To use local anesthesia, obtaining a surgical field with little blood, and avoiding the use of a tourniquet, and also to prevent discomfort and allow the cooperation of a fully conscious patient without use of sedation, the strategy is to associate the local anesthetic with epinephrine, a vasoconstrictor drug. The use of epinephrine in extremities, such the hand and fingers, is formally contraindicated in classical hand surgery textbooks.<sup>3,4</sup> Despite the references to the use of local anesthesia with epinephrine in the upper limb in articles from the 1970s, 1980s, and 1990s,<sup>5-7</sup> only at the beginning of the 21st century did this technique accumulate consistent scientific support to gain favor and win over some surgeons.<sup>8,9</sup>

Although Novais Junior et al.<sup>10</sup> in 2014 and Barros et al.<sup>11</sup> in 2016 published the use of this technique in hand surgery in a Brazilian journal, with highly favorable results, its use is not widespread in the country.

The question of whether the operating conditions of the hospitals and the social and cultural characteristics of the physician and patients in Brazil would allow hand surgeries with local anesthesia using epinephrine, without tourniquet and without the presence of an anesthesiologist remains unanswered.

The present study is aimed at prospectively evaluating the incidence of digital infarction and tissue necrosis with the use of local anesthesia with 1% lidocaine/1:100,000 epinephrine solution in hand surgeries without a tourniquet, without sedation, and without an anesthesiologist, in two teaching hospitals specializing in orthopedics and traumatology and hand surgery.

## Material and methods

The study was previously submitted to and approved by the Research Ethics Committees of the participating institutions.

Patients with traumatic and non-traumatic lesions of the wrist, hand, and fingers requiring surgical treatment were scheduled for surgery with local anesthesia with a 1% lidocaine/1:100,000 epinephrine solution, without a tourniquet, sedation, or anesthesia and without pre-surgical exams, in two teaching hospitals in orthopedics and traumatology and hand surgery.

Inclusion criteria were age above 18 years; surgeries in the wrist, hand, and fingers; no need for surgical access in other places. Exclusion criteria were refusal of the patient in participating of the study; previous finger infarction; sequelae of finger crushing; Buerger's disease; revision of Dupuytren's surgery; clinically evaluated vasospasm and severe ischemia of the fingers and hand; surgeries with probable duration of more than 2 h; and patients who were too nervous to undergo surgery with local anesthesia without sedation, according to the surgeon's evaluation. Tobacco use was not an exclusion criterion.

The patients were anesthetized and operated by surgeons specialized in hand surgery or orthopedics and traumatology, and by residents in these specialties, under supervision.

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