

Rocuronium as Selective Local Musclerelaxant in Orthopedic Surgery

Ezio Vincenti^{1*}, Alberto Todesco¹ and Giovanni Grano²

¹Department of Anesthesia, Pozzonovo Mediclinic Padua, Anesthesia and Surgery, Italy

²Department of Anesthesiology, Cittadella Hospital, Padua, Italy

³Department of Orthopedics and Traumatology, Cittadella Hospital, Padula, Italy

*Corresponding author: Ezio Vincenti, Director of Anesthesia, Department of Anesthesia, Pozzonovo Mediclinic Padua, Anesthesia & Surgery, Italy, Tel: +393922602513; E-mail: evincenti@libero.it

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Letter to the Editor

Dear Editor,

A variety of surgeries need profound muscular block solely in an exceedingly restricted surgical field. Recent accessibility of sugammadex, a cyclodextrin derivative antitoxic substance active on an amino steroid muscle relaxant, has offered the likelihood of maintaining a prolonged deep neuromuscular paralysis with a rapid reversal at the end of surgery. As a consequence, complete post anesthesia recovery is often rapidly obtained under safe clinical conditions. However, in selected patients, a muscle relaxant can be locally injected at low doses in one or more muscles concerned within the surgical technique without a systemic paralysis.

The native injection of rocuronium, promptly and easily encapsulated by sugammadex if necessary, avoids excessive muscular stretching, probably harmful. In addition, the surgeon himself will inject rocuronium at the right time and within the muscle/muscles involved in the surgery, under direct supervision of the anesthetist responsible for the rocuronium preparation.

According to pharmacokinetics and pharmacodynamics, a complete dose of 10 mg rocuronium in 5 ml volume with saline (2 mg/ml) was chosen to test the feasibility of the new method [1]. Regarding type of surgery, preference was given to some orthopedical miniminvasive procedures. Following consent of patients and approval of ethical direction, three patients scheduled for hip substitution (2 cases) or shoulder surgery (one case) were respectively submitted to spinal anesthesia with hyperbaric bupivacaine (14-15 mg) in propofol-TCI sedation (1.8-2.5 mcg/ml) and to light general anesthesia with propofol-remifentanyl. In all cases, a laryngeal mask was inserted to shield airway and mechanical ventilation was assured in air/oxygen mixture. An entire non-invasive monitoring was used, together with TOF stimulation at nervus ulnaris.

In the hip surgery, a mini-invasive anterolateral section with detachment free technique was adopted. Therefore, the surgeon injected 10 mg rocuronium in various sites of striated muscle medius: in 15-20 seconds a complete paralysis of the muscle was obtained. Therefore, the Hohmann bone lever was easily inserted and managed

without stretching or forcing the muscle. No modification in time of TOF monitoring was observed. Apparently, complete native muscle relaxation lasted over 40 minutes, time sufficient to carry out the surgery.

The third case involved a surgery of shoulder for treatment of irreparable rotator cuff tears which resulted in weakness and pain on overhead activities. The surgeon locally injected a total dose of 10 mg rocuronium just before the transfer of the proximal part of latissimus dorsi myofascial muscle resulting in a prompt effective relaxation suitable to permit an easy transfer of the muscular flag without any traction of its fibers. In this case as well, apparent duration of the entire muscle relaxation was superior to 40 minutes. TOF monitoring was maintained for another 45 minutes after the end of anesthesia to control the absence of appearance of any late systemic recurarization. Each member of surgical team was satisfied with new technique and also the patients were grateful for the care received. No side effects were observed intra- and postoperatively.

In conclusion, the primary three clinical cases of orthopedic surgery in which local selective and personalized muscle relaxation was intraoperatively tested have shown very good results [2]. As a consequence, a wider group of patients could be admitted in future to avail the facility of such a new methodology once an entire muscle relaxation is locally requested. However, it is preferable to avoid a systemic curarization, as in high risk patients. Absence of any side effects and the efficacy of local paralysis for a sufficient time under careful control and at appropriate doses of rocuronium, may propose the method for other surgeries, not just for orthopedics. However, next investigation steps are necessary to additionally elucidate this innovative technique.

References

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