

Transient Femoral Nerve Palsy Following Field Block For Inguinal Herniorrhaphy

J Epperson, A Reese

Citation

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Abstract

Transient femoral nerve palsy (TFNP) is a potential complication of ilio-inguinal nerve blockade for inguinal herniorrhaphy. Speculation has occurred to its cause and prevention. We report a case of TFNP after field blockade at conclusion of inguinal herniorrhaphy, with following review of potential causative mechanisms and prevention.

INTRODUCTION

Transient femoral nerve palsy (TFNP) has been reported as an uncommon, but documented, complication of local anesthesia for inguinal herniorrhaphy. This uncommon event has the potential to lengthen hospital stay, and in at least one case report serious injury has occurred. (1,2,3) While case reports of this complication are sparse, in some patient populations the incidence has been reported to be as high as 8%. (4) We report a case of transient femoral nerve palsy following a field block placed for post-operative pain control following inguinal herniorrhaphy.

CASE

A 54 year old male presented for correction of an indirect inguinal hernia. The patient's past medical and surgical history were insignificant for co-morbidities or anesthetic difficulties. The patient requested general anesthesia for the case. Induction, LMA placement, and positioning were without incident. No muscle relaxants were used for the procedure.

At the end of the procedure the surgeon performed a field block in the area of the surgical incision while the patient was still under general anesthesia. A total of 20ml of 0.5% bupivacaine with 1:200,000 epinephrine was injected at the time of wound closure. The case concluded without any surgical or anesthetic incidences, and patient was taken to post-anesthesia care unit in stable condition.

Approximately 2 hours later, on preparation for hospital discharge, the patient was unable to ambulate secondary to weakness of the left leg. Anesthesia was called to evaluate

the patient at that time. Physical examination revealed extreme weakness of the left quadriceps with inability to extend the left leg at the knee. Complete sensory anesthesia was found over the anterior and medial aspects of the thigh that extended just below the knee on the left leg corresponding to a femoral nerve distribution. No weakness was noted on flexion at the knee, and no weakness or sensory anesthesia was found in the right leg.

The patient was admitted for observation overnight. By the next morning the femoral nerve palsy had completely resolved and the patient was discharged to home.

DISCUSSION

The importance of understanding the mechanism of transient femoral nerve palsy (TFNP) after ilio-inguinal field blockade may help clinicians to recognize and possibly avoid this complication.

Ilio-inguinal nerve blockade is performed with the patient in the supine position. A point 3 cm inferior and 3cm medial to the anterior superior iliac spine is then marked. The needle is inserted perpendicular to the skin and a total of 10 ml of local anesthetic is to be deposited deep to the external oblique fascia. Infiltration of local anesthetic subcutaneously, along the incision is then performed.(5)

D. J. Rosasrio et al. performed a cadaver study showing a proposed mechanism for TFNP following ilio-inguinal field block. In this study "the plane between the transverse abdominis muscle and the transversus fascia was continuous laterally with the tissue plane deep to the iliacus fascia, which is the plane containing the femoral nerve." Injection

of methylene blue 1 ml resulted in pooling of the dye around the femoral nerve when injected in this plane. When 1 ml of methylene blue was injected superficial to this plane, it remained confined to the area of injection. In this study the difference in the depth of injection was approximately 2-3 mm. (6)

Another possible mechanism of TFNP following ilio-inguinal field block is deposition of local anesthetic directly around the femoral nerve. According to the same study by Rosario et al. placement of the needle approximately 3-4 cm medially using the above technique could lead to injection of local anesthesia directly around the femoral nerve.

Careful attention to technique and avoidance of local anesthetic infiltration deep to the transverse abdominis may help to avoid this complication. The above study does not speculate on the volume or concentration required to cause TFNP, but in a separate study by Wulf et al. examining plasma concentrations of escalating concentrations of ropivacaine after ilio-inguinal nerve block, sensory block was consistent throughout dosage concentrations, while motor block was seen only in the higher doses of ropivacaine. (7) Considering this, it would seem prudent to use the least amount and lowest concentration of local anesthetic required when performing this block. This would limit the amount of local anesthetic available to follow this fascial plane leading to TFNP.

Some reports have speculated that the incidence of TFNP may be reduced by performing the block under direct visualization by the surgeon after the surgical incision. Ghani et al. in 2002 reported a retrospective analysis of the incidence of TFNP at their institution. The data from this study showed no difference in the incidence of TFNP

whether the ilio-inguinal nerve block was performed by an anesthesiologist preoperatively or performed peri-operatively under direct vision by the surgeon. In both cases the incidence of TFNP was approximately 5-6%. (8)

TFNP is a complication that rarely leads to any lasting morbidity, but can lead to an increase in PACU resources, as well as, increased length of hospital stay, as well as a potential health hazard for patients with unrecognized leg weakness. Because of this, a high index of awareness to the proximity of the femoral nerve to the inguinal canal and the signs of femoral nerve palsy, by the anesthesiologist and PACU personnel, is needed to prevent further complications or even injury when it does occur.

References

1. Lewis R, Fell D. A complication of ilio-inguinal block for inguinal hernia repair. *Anesthesia* 1988; 43: 249.
2. Rosario D.J., Skinner P., Raftery T. Transient femoral nerve palsy complicating preoperative ilioinguinal blockade for inguinal herniorrhaphy. *British Journal of Surgery* 1994; 81: 897.
3. Buist RJ, Mansour NY. Femoral nerve block as a complication of ilio-inguinal nerve block. *Anesthesia* 1988; 43: 805.
4. Lipp AK, Woodcock J, Hensman B, Wilkinson K. Leg weakness is a complication of ilio-inguinal block in children. *British Journal of Anaesthesia* 2004; 92(2). 273-274.
5. Brown, David L. *Atlas of Regional Anesthesia*, 2nd ed. Philadelphia: W.B. Saunders Company, 1999.
6. Rosario D.J., Jacob S., Luntley J., Skinner P., and Raftery T. Mechanism of femoral nerve palsy complicating percutaneous ilioinguinal field block. *British Journal of Anesthesia* 1997; 78: 314-316
7. Wulf H., Wothrmann F., Behnke H., Bohle S. Pharmacokinetics and pharmacodynamics of ropivacaine 2mg/ml, 5mg/ml, or 7.5mg/ml after ilioinguinal blockade for inguinal hernia repair in adults. *Anesthesia and Analgesia* 1999; 89: 1471-1472.
8. Ghani KR, McMillan R, Paterson-Brown S. Transient femoral nerve palsy following ilio-inguinal nerve blockade for day case inguinal hernia. *J R Coll Surg Edinb* 2002; 47. 626-629.

Author Information

J. Epperson, M.D.

Resident physician, Department of Anesthesiology, University of Missouri Kansas City School of Medicine, Saint Luke's Hospital

A. Reese, M.D.

Assistant professor, Department of Anesthesiology, University of Missouri Kansas City School of Medicine, Saint Luke's Hospital