

Transient Quadriceps Paresis After Ilioinguinal Nerve Block

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ABSTRACT

A patient developed transient quadriceps paresis after ilioinguinal and iliohypogastric nerve block in the ambulatory surgery centre.

Keywords: ilioinguinal and iliohypogastric nerve block, femoral nerve block

INTRODUCTION

Neurologic complications following nerve blocks in the ambulatory surgical centre setting is disturbing both to the patient and anaesthetist especially if discharge is delayed, or admission becomes necessary.

The ilioinguinal and iliohypogastric nerves provide the sensory innervation to the lower abdomen, inguinal and perineum⁽¹⁾. The ilioinguinal and iliohypogastric nerve block is hence frequently used for intra and post-operative relief of pain for operations in these areas. Hence, awareness that transient quadriceps paresis may be a complication is important.

CASE REPORT

The patient was a 35-year-old male with no past medical history of note. He was to have an exploration of a left epididymal cyst. Anaesthesia was induced with fentanyl and propofol. A laryngeal mask was inserted and anaesthesia was maintained with nitrous oxide, oxygen and isoflurane. A 21-gauge hypodermic needle (Sterican) which was not blunted was inserted at a point 1 cm medial to the anterior superior iliac spine. Ten mLs of bupivacaine was deposited after loss of resistance occurring at the penetration of the external oblique aponeurosis. No fanning of the drug was made during the injection. The patient was operated upon in the supine position. The surgery was uneventful, there was no traction of the femoral nerve and no local infiltration of anaesthetic.

Eight hours later in the recovery room, the patient complained that he was unable to stand because of weakness in his left leg. On clinical examination, he was found to have reduced sensation to touch on the medial aspect of his thigh and calf over the L2, L3 and L4 distribution. He had no pain over the wound. He was unable to extend his leg at the knee which indicated a motor block at the quadriceps muscle innervated by the femoral nerve L2, L3 and L4 roots.

He was admitted and transferred from the ambulatory centre to the inpatient ward. An urgent referral was made to the neurologist who made the

assessment of femoral nerve neuropathy.

About 12 hours after the time of the block, the patient reported that he had no more numbness or weakness. This was confirmed on clinical examination. He had no more sensory loss and regained full power of his quadriceps. He was observed over night and discharged the following day.

DISCUSSION

Transient femoral nerve neuropathy has been implicated not only after ilioinguinal and iliohypogastric nerve block but also after subcutaneous injection and local infiltration at the internal inguinal ring⁽²⁾.

The etiology is as yet unknown. The lumbar plexus is formed from anterior rami of the 1st, 2nd, 3rd and 4th lumbar nerve roots which emerge from the intervertebral foramina of the lumbar vertebrae. The plexus is located within the substance of the psoas major. The iliohypogastric and ilioinguinal nerve arise from the lumbar plexus within the psoas muscle. They cross the quadratus lumborum and pierce the transversus abdominis. In the anterior abdominal wall, the iliohypogastric nerve lies between the internal and external oblique at the level of the anterior superior iliac spine. The ilioinguinal nerve lies between the transversus abdominis and the internal oblique muscle and penetrates the internal oblique at a variable distance medial to the anterior superior iliac spine⁽³⁾. Hence, the anterior superior iliac spine is a useful landmark for the peripheral extensions of these two nerves. The ilioinguinal nerve then pierces the internal oblique below and lateral to the iliohypogastric nerve and enters the inguinal canal to accompany the spermatic cord or round ligament and become superficial after passing through the external ring to supply skin over the perineum and thigh⁽⁴⁾.

The femoral nerve (L2-4) emerges from the lateral margin of the psoas, passes downwards in the groove between the psoas and iliacus muscles within the iliacus fascia then enters the thigh beneath the inguinal ligament⁽⁵⁾. The femoral nerve is hence in proximity to the ilioinguinal and iliohypogastric nerve at the lumbar plexus and not at the location of the anterior superior iliac spine which is used as a land mark for the block.

Hence, there does not seem to be any anatomical connection between the femoral nerve and the ilioinguinal and iliohypogastric nerves around the

anterior superior iliac spine. Accidental injection into the iliac fascia where femoral nerve block can occur is a possibility. It is suggested by at least one author that contact with the ileum should be made during ilioinguinal and iliohypogastric nerve block⁽⁶⁾, this may perhaps increase the risk of injection into the iliac fascia. This concern is voiced by Buist⁽⁷⁾ who suggested that contact with the ileum should be avoided and penetration should stop at a depth soon after the external oblique aponeurosis has been pierced. He also suggested that a 3.8 cm block needle would help tactile appreciation of the passage of the needle through the external oblique aponeurosis as well as limiting the depth of penetration⁽⁷⁾.

Another postulation of the possible mechanism of this complication stems from reports that femoral nerve blockade has occurred even after local and subcutaneous infiltration of anaesthetic after herniarraphy and varicocele repair^(1,2). In these operations, there is no anatomical disruption of the transversalis fascia or inguinal ligament, yet the local anaesthetic has undoubtedly spread from one plane to the next. This has led to postulation that there are unidentified communication between fascia slings in the groin and femoral sheath⁽⁸⁾.

A third possibility is that injected anaesthetic may track through areolar tissue superficial to the external oblique aponeurosis and hence to the area below the inguinal ligament where the femoral nerve lies⁽¹⁾. Lewis and Fell suggest that fanning of the anaesthetic during the block should be avoided⁽⁸⁾.

Retrograde tracking of the anaesthetic to the lumbar plexus as occurs in the 3 in 1 lumbar plexus block⁽⁹⁾ is a less likely postulation. Firstly, the volumes required are generally larger (15-20 mL) for reliable spread of the anaesthetic. Secondly, if this was the mechanism then the other nerves such as the lateral femoral cutaneous nerve and obturator nerves would have led to sensory deficits in the medial and lateral of the thigh prior to involvement of the ilioinguinal and iliohypogastric nerves⁽⁹⁾.

Surgical trauma may on occasion have a part to play as suggested by Collier⁽¹⁰⁾ but in the reported cases, it was emphasised that no undue traction to tissue layers had occurred.

Although the etiology is as yet unknown, post operative femoral neuropathy is a distressing

complication of ilioinguinal and iliohypogastric nerve block which may result in admission to hospital if the incident occurs in the ambulatory surgical setting. The incidence in one study was 3 in 81 which is about 3%-4%.

A summary of guidelines that may reduce the risk of such a complication is firstly, using a more dilute solution of perhaps 0.25% instead of 0.5% bupivacaine so as to reduce motor blockade⁽¹¹⁾. Secondly, contact with the ileum should be avoided and fanning minimised⁽⁶⁾.

Awareness of this rare complication is important and equally vital is the knowledge that only reassurance and observation are required and no necessary alarm need be raised.

ACKNOWLEDGEMENT

The author would like to thank Dr Agnes Ng for her help and encouragement.

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