

# Femoral nerve injury following laparoscopic hernioplasty for inguinal hernia: open exploration of the groin and neurolysis after two months

## Abstract

**Purpose:** Complications after inguinal hernia repairs, laparoscopic or open are uncommon but well known to surgeons. Since the introduction of laparoscopic herniorrhaphy several cases of nerve injuries were reported but few of them concerning the femoral nerve.

**Case report:** The case of a 36 year old female patient is discussed, who suffered from severe pain in the right thigh and the right knee after laparoscopic hernioplasty for a unilateral right inguinal hernia. The surgeons who operated the patients suggested that the symptoms were due to a meniscus lesion and an earlier prolapsed O4-O5 intervertebral disc. The patient referred to our hospital two months later, where she underwent meticulous clinical and laboratory examination. Femoral nerve injury was diagnosed and surgical exploration was performed where the femoral nerve was found stapled and the staple was “unscrewed” from it. Symptoms radically and rapidly improved after the operation.

**Conclusion:** Good anatomic knowledge and experience is important during laparoscopic inguinal hernia repairs so as to avoid the “danger zone” and thus injuring the nerves of the groin while stapling the mesh. Diagnosis and treatment of nerve injury following laparoscopic inguinal herniorrhaphy is a difficult and controversial task for the surgeon. We recommend a meticulous clinical and laboratory investigation; these patients should undergo early surgical treatment when and if needed.

**Keywords:** inguinal hernia, laparoscopic inguinal hernia repair, femoral nerve injury, groin nerve injury

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## Introduction

While the open anterior approach remains the most popular technique for the management of inguinal hernias, the laparoscopic methods (both transabdominal preperitoneal-TAPP, and totally extraperitoneal-TEP repairs) are well established alternatives in everyday practice. Open management of inguinal hernias has improved with the introduction of prosthetic materials and tension-free repairs but numerous complications have been described over the years such as injuries of the intestine, urine bladder, spermatic cord, blood vessels and nerves.<sup>1,2</sup> The proponents of the laparoscopic repair are improved patient comfort, less post-operative pain, early mobilisation, fast recovery and return to normal activities. Laparoscopic herniorrhaphies are considered to be safe surgical techniques with low recurrences and acceptable complication rates (2-12%) according to several studies.<sup>3-5</sup> However nerve lesions are the most frequent complications after laparoscopic inguinal hernia repair, in most cases involving the iliohypogastric, the ilioinguinal, the lateral femoral cutaneous and the genitofemoral nerve.<sup>6</sup> Injury of the femoral nerve is a very rare complication.<sup>7</sup> We present a case of femoral nerve injury after transabdominal laparoscopic herniorrhaphy (TAPP) for a unilateral inguinal hernia, misdiagnosed and treated as a meniscus lesion.

## Case report

A 36-year-old female underwent laparoscopic hernioplasty for a right inguinal hernia on May 2012. The patient immediately after the

operation experienced severe, burning pain at the right thigh and knee. She also had paresis of the right quadriceps muscle, so standing and walking was difficult and painful. During a prolonged hospital stay the patient was under analgesic and anti-inflammatory medication. The doctors attributed the situation to an old right meniscus lesion and an MRI of the right knee was scheduled, which revealed a minor lesion of the right meniscus. She also had a CT scan of the lumbar spine in order to exclude any low-back pathology, where an already known light prolapse of the O4-O5 intervertebral disk was found. The patient was discharged on the fourth postoperative day; she was prescribed analgesics and was scheduled for surgery of the right knee, which she refused.

The severe pain of the right thigh and knee persisted while her ability to walk was continually improving with the help of physiotherapy. After almost two months from the laparoscopic operation she referred to our hospital. She underwent a meticulous clinical examination and a thorough study of the laboratory examinations (knee MRI, lumbar spine CT scan). The symptoms could not be attributed to an intervertebral disk prolapse or to the minor meniscus lesion. An electromyography of the right leg was then performed. The findings were typical for denervation of the right femoral nerve (high amplitude dynamics, echomyography compared to the intact left femoral nerve). The patient was proposed an open exploration of the right groin in order to perform neurolysis of the right femoral nerve.

Under spinal anesthesia and through a longitudinal section in the midline of the right upper thigh and groin, the right femoral nerve

was dissected along its course. It was then found injured with a spiral tacker below the inguinal ligament. The tacker was “unscrewed” from the femoral nerve. There was scarred tissue at the medial side of the femoral nerve with another spiral tacker, which was also mobilized and removed. The patients’ symptoms improved dramatically right after the operation. One month after the operation she had no pain at all and his walking ability was still improving. Almost five years later her general condition is good, she suffers from no pain and has successfully returned to all everyday activities and work (Figures 1 & 2).

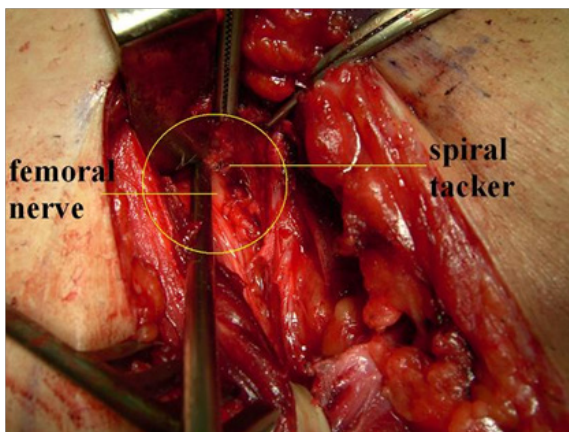


Figure 1 The spiral tacker on the femoral nerve.

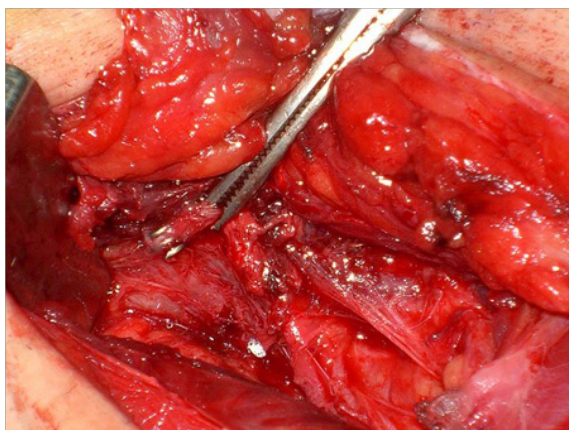


Figure 2 Scarred tissue and second tacker medially to the femoral nerve.

## Discussion

Injury of the groin nerves during traditional open inguinal hernia repair and laparoscopic repairs is already reported in several studies.<sup>4,8,9</sup> The nerves at risk are the ilioinguinal, iliohypogastric, genital branch of the genitofemoral, lateral femoral cutaneous and the femoral nerve.<sup>7</sup> Injury of the femoral nerve is a rare complication but can occur, mostly during laparoscopic repairs.<sup>3,7</sup> In the laparoscopic repairs, big meshes are fixed to the abdominal wall using staples, from the symphysis pubis to the anterior superior iliac spine. The staples are placed preperitoneally so the nerves of the groin cannot be easily identified and therefore protected from possible injury.<sup>1,9</sup> Good knowledge of the anatomic course of these nerves is important in order to avoid injury. Many writers describe this field as the “danger zone”<sup>1</sup> or the “trapezoid of disaster”<sup>10</sup> and it extends lateral to the anterior

spine and cranially to the iliopubic tract.<sup>6</sup> Therefore surgeons have to keep the staples superior to the iliopubic tract.<sup>9</sup> Later reports suggest that the mesh should not be fixed with staples during laparoscopic repairs since the risk of migration is certainly of low importance compared to nerve injury.<sup>5,11</sup>

While prevention is easy to discuss, the diagnosis of nerve injuries after hernia repairs is still difficult, especially if the femoral nerve is involved. Sampath et al. suggested that early decompression in properly selected patients may be the ideal management of such injuries.<sup>1</sup> In another study the importance of meticulous laboratory examination is designated so as to spare some patients from unnecessary surgical explorations.<sup>6</sup> An early report in 1997 suggests that patients with symptoms of nerve injury following herniorrhaphy should be investigated with electromyography-electroneurography (EMG-ENG), which is essential for diagnosis and prognosis.<sup>12</sup> In the cases where lesion of the axons is diagnosed, as it happened with our patient, exploration should be the treatment of choice, without any further delay.<sup>7</sup> Other writers suggest conservative treatment, and if the symptoms persist for more than 4-6 weeks surgical exploration should be performed, either to remove the staples or perform neurolysis.<sup>9</sup> In any case the period of 4-6 weeks seems to be crucial for the treatment of these patients.<sup>7,9</sup>

Though the laparoscopic herniorrhaphy gains more and more space in everyday practice, complications involving the nerves of the lumbar plexus are hopefully rare. Good anatomic knowledge and experience is imperative so as to avoid injuring these nerves with the use of staples. Eventually the trend is to abandon fixation of the meshes in modern hernia repairs, which will prevent patients from important and severe nerve injuries, since their diagnosis and treatment is still controversial. We believe that any patient with symptoms of nerve injury following inguinal hernia repair should be investigated with EMG-ENG and treated with surgical exploration when and if necessary.

## Acknowledgements

None.

## Conflict of interest

The authors declare that they have no conflict of interest.

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