Transection of the obturator nerve by an electrosurgical instrument and its immediate repair during laparoscopic pelvic lymphadenectomy: a case report

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Summary

Obturator nerve injury seldom occurs in gynecologic surgery. However, gynecologic oncologic surgery, including pelvic lymph node dissection, increases the risk of this type of injury. Microsurgical techniques are usually performed for the repair of the nerve injury. Herein the authors report a case of obturator nerve injury caused by an electrosurgical instrument during laparoscopic pelvic lymphadenectomy, and its prompt repair by laparoscopic procedure in a 44-year-old patient with cervical cancer.

Key words: Obturator nerve injury; Laparoscopic neurorrhaphy; Pelvic lymphadenectomy.

Introduction

Obturator nerve injury is a rare complication in gynecologic surgery [1,2]. However, performing pelvic lymphadenectomy during a radical pelvic surgery or staging surgery for gynecologic malignancies increases the risk of obturator nerve injury [3,4]. Surgical treatment is mandatory in the management of the injured obturator nerve during lymphadenectomy. The options for surgical treatment are laparoscopic and transabdominal approaches [5]. Herein, the authors report a case of an obturator nerve that was transected and thermally injured by an electrosurgical device during laparoscopic radical hysterectomy, pelvic lymphadenectomy, and para-aortic lymph node dissection, and the immediate repair of the nerve using the laparoscopic approach.

Case Report

A 44-year-old Korean woman (gravida 7, para 2) had a four-month history of post-coital bleeding. The results of cervical liquid-based cytology examinations and DNA-based assays showed high-grade squamous intraepithelial lesions and infection with human papillomavirus type 16. A colposcopically directed biopsy and a subsequent conization by the loop electrosurgical excision procedure of the uterine cervix revealed a moderately differentiated squamous cell carcinoma. A bimanual rectovaginal examination of the patient for clinical staging under general endotracheal anesthesia revealed a 2.0- × 2.0 cm mass confined to the cervix of the uterus without parametrial extension. Cystoscopy and proctosigmoidoscopy demonstrated no infiltration of the bladder or rectum. A metastatic workup, which included magnetic resonance imaging (MRI) of the abdomen and a pelvis positron emission tomography (PET) scan of the torso, revealed no evidence of distant metastasis. The International Federation of Obstetrics and Gynecology (FIGO) clinical Stage of the disease was IB1.

The patient underwent laparoscopic radical hysterectomy, bilateral pelvic lymphadenectomy, and para-aortic lymph node sampling with a three-port transperitoneal laparoscopic approach (Figures 1A and B). During right pelvic lymphadenectomy, the right obturator nerve was inadvertently transected by an electrosurgical device (Figure 1C). The injury occurred because the right obturator nerve was extremely superficial compared to its usual location. The Department of Orthopedic Surgery and Neurosurgery was consulted to learn how to perform precise surgical techniques and choose appropriate suture materials during the surgery in relation to this injury. After the laparoscopic lymphadenectomy was safely completed, a careful inspection showed that the nerve was transected and had thermal injury at the ends. After debridement of the thermally injured ends, they were re-approximated laparoscopically end-to-end with two 6-0 polypropylene sutures for perineural repair and three 6-0 epineural sutures for achieving a tension-free anastomosis (Figures 1D, E, and F). Because the debrided portion of the nerve was only six mm (three mm at each end), a tension-free repair without further mobilization of the nerve appeared to be possible. An immediate laparoscopic repair of the nerve was performed by the gynecologic surgeon. The total operative time was five hours, and the blood loss was 180 ml. The postoperative course was uneventful. Histologic examination revealed a 2.5 × 2.0 cm, moderately differentiated, large cell, non-keratinizing, squamous cell carcinoma confined to the uterine cervix without lymph involvement.

The patient noted mild weakness of the right leg on the operative day when she awoke from the anesthesia. However, she was able to ambulate on the first postoperative day and did not show any clinical evidence of abnormal adductor function or any other neurologic deficit on neurologic examination. She was discharged on the seventh post-operative day, and no specific physical or medical therapy was performed. At 12 months postoperatively, she is doing well and is healthy without any neurologic deficit.

Discussion

The obturator nerve is a mixed sensorimotor nerve that initiates from the lumbar spine (L2–L4) and innervates the adductor muscles of the medial thigh [3]. The nerve trav-

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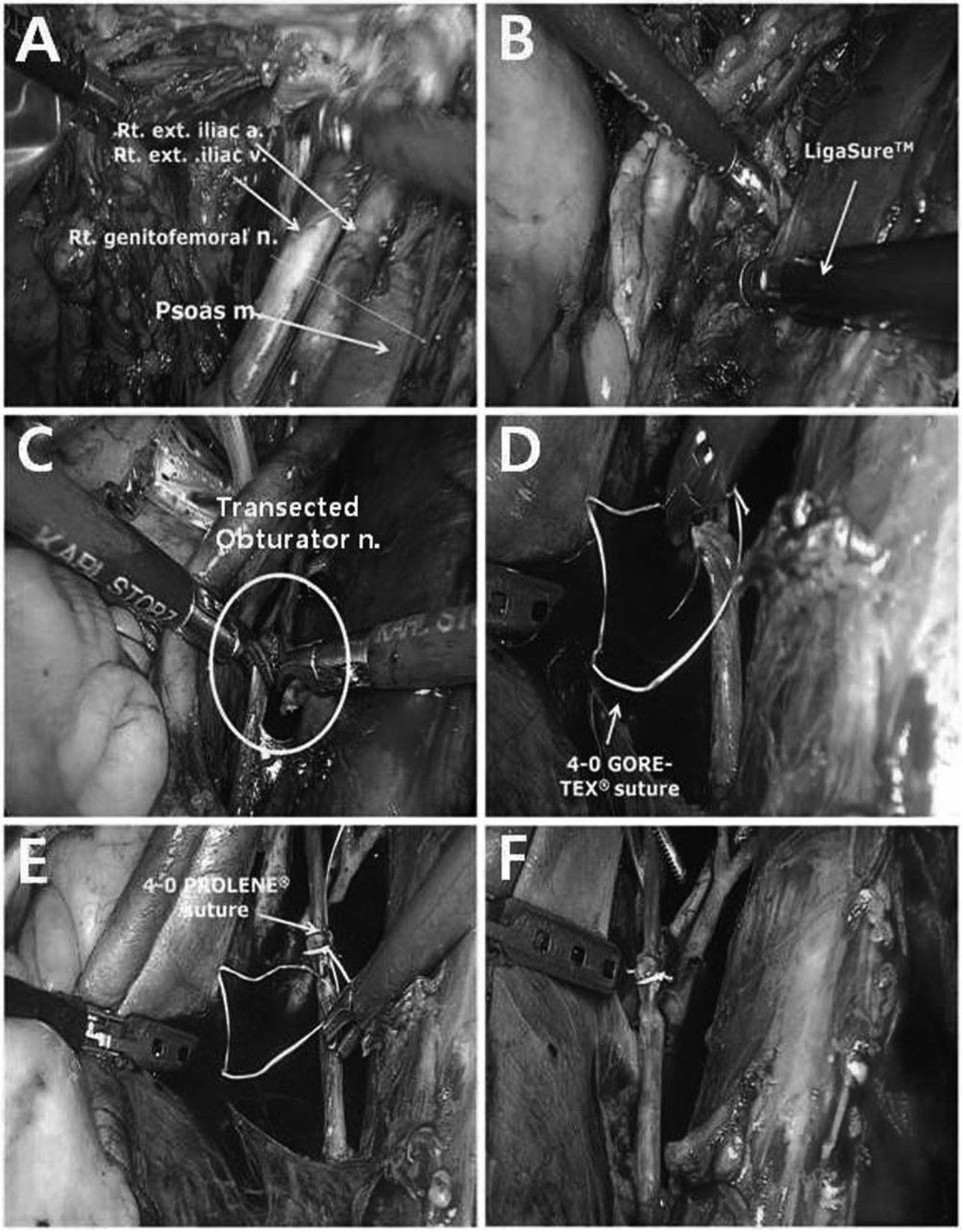

Figure 1. — Image of the obturator fossa seen in laparoscopy. The image shows the repaired obturator nerve with the epineural end-to-end tension-free reattachment. A): right obturator lymph node dissection; B) injured obturator nerve; C) transected right obturator nerve; D), E), and F) laparoscopic neurorrhaphy for transected right obturator nerve with 6-0 polypropylene suture and 6-0 suture.

els through the pelvis within the obturator fossa and then leaves the pelvis with the obturator artery and vein via the obturator foramen. In gynecologic surgery, injury of the obturator nerve is extremely rare, and is most frequently associated with endometriosis, obstetrical forceps injury, obturator hernia, pelvic lymphadenectomy for the treatment of gynecologic and urologic malignant lesions, and a prolonged dorsal lithotomy position [1-3,5,6]. Neurotmesis of the obturator nerve by surgical instruments during surgery is rarely reported as a complication in gynecologic surgery [3,7]. Because the obturator nerve is surrounded by adipose tissue, soft tissues, and lymph nodes in the obturator fossa, the identification of the nerve prior to the removal the tissues and lymph nodes is usually difficult. Therefore, the obturator nerve can undergo complete transection or thermal damage by various surgical instruments as a result of blunt or sharp dissections during pelvic lymphadenectomy. In the present case, the right obturator nerve underwent complete division and thermal damage by an electrosurgical device. Injury of the obturator nerve usually causes pain extending down the medial thigh into the knee and hip (Howship-Romberg sign), gait disturbance due to weakness of the adduction of the thigh, and sensory loss of the medial thigh [3]. If the obturator nerve is cut during the surgical procedure, its immediate repair is mandatory. Repair is generally performed with microsurgical techniques. However, laparoscopic surgical techniques are considered to be useful alternatives to microsurgical techniques in this case, since laparoscopy is usually able to show a magnified view sufficient for performing a meticulous repair with very thin sutures. The most important step in the repair is the epineural end-to-end tension-free coaptation [3,7]. Resolution of the symptoms from the obturator nerve injury depends on the severity and nature of the injury. However, patients with immediately repaired nerve injury usually show complete resolution of the symptoms within one year after injury [7]. In this case, a notable point is that the right obturator nerve was injured with thermal damage by an electrosurgical instrument. After debridement at both ends of the cut, an epineural end-to-end tension-free coaptation was performed. Within six months after immediate repair, the symptoms were completely resolved. In the case of nerve injury with thermal damage, immediate repair also seems to be mandatory and to be able to minimize the sequelae. If tension-free reattachment of the nerve ends is impossible due to extensive nerve damage or loss, immediate grafting of the nerve may be necessary [4,8].

Conclusions

This case suggests that laparoscopic repair of the transected obturator nerve is a feasible surgical technique alternative to microscopic surgery, and a divided nerve with thermal damage also can also be completely recovered by meticulous debridement and repair.

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