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# Laparoscopic Resection of Perineural Obturator Cystic

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## 1. Abstract

### 1.1. Introduction

Primary Obturator Nerve pathologies are extremely rare; however, iatrogenic injury might be more common or under reported due to many pelvic lymphadenectomies performed in urology. Our objective is to describe this uncommon pathology laparoscopic resected and review the literature about reports of obturator nerve iatrogenic injury.

### 1.2. Case Presentation

A 68-years-old male consulted for lower urinary tract symptoms, associated with left inferior leg pain treated for several years. An ultrasonography demonstrated a cystic lesion beside the bladder confirmed in the CT scan. Without a clear diagnosis, an exploratory laparoscopic was performed. After posterior peritoneum incised between femoral and umbilical artery, an obturator cystic was identified and laparoscopic resected preserving de nerve. Histopathological findings demonstrated a mucoid pseudocystic.

### 1.3. Conclusion

Obturator nerve pathologies are uncommon; however, iatrogenic injuries might be more frequent or under reported. Preserve nerve is necessary, even its support structures to recover part of the nerve function.

## 2. Keynote Message

Primary ON cysts are uncommon, with few case reports. However, iatrogenic injury might be more prevalent or probably under reported despite frequent lymphadenectomies in gynecological and urological surgeries. Therefore, urologists should know how to manage these injuries.

## 3. Introduction

The obturator Nerve (ON) is a mixed nerve originates from the lumbar plexus, specifically lumbar 2 to 4. It crosses the medial border of the psoas muscle, passes laterally to the hypogastric vessels and ureter, and continues through the lesser pelvis until reaches the obturator foramen. Its sensory function includes the skin of the inner thigh, the coxofemoral and knee joints; and the motor function primarily involves the hip adductor muscles [1].

It has been described 3 types of nerve injuries; neuropraxia which involves a demyelination and recovers within 2 to 3 months after the remyelination process; axonotmesis characterized by axonal disruption while preserving supporting structures and, neurotmesis characterized by the complete axonal disruption with few chances of recovery without any intervention [2]. Primary ON pathologies are extremely rare. Schwannomas, neurofibromas, perineuromas and peripheral nerve sheath tumors have been described 1. However, iatrogenic injuries are probably more common, particularly during pelvic lymphadenectomies in gynecological and urological surgeries. Since there are no imaging studies that can accurately diagnose the etiology, surgical approach is mandatory. Optimal management of iatrogenic ON injuries is necessary to resolve these cases with good outcomes. Due to the rarity of this condition and the lack of familiarity within urologists, our aim is to report a

case of a cystic pelvic tumor from ON treated laparoscopically and review the literature to propose the best resolution.

## 4. Methods

We present a 68-year-old male patient who consulted for lower urinary tract symptoms, primarily irritative, associated with left inferior leg pain treated by traumatologist for several years. An ultrasonography revealed a left-sided cystic lesion adjacent to the bladder and a CT scan confirmed a 57 x 56 mm cystic lesion without communication with the bladder and ureter (Figure 1a). With no clear diagnosis, a laparoscopic exploratory was performed.

## 5. Results

After resecting the posterior peritoneum and accessing to the obturator fossa, we realized that the cystic lesion originated from the ON (Figure 1b, c). It was electrically stimulated showing no signs of obturator muscle contraction; nevertheless, cystic lesion was successfully resected preserving part of the nerve (Figure 1d). There were no postoperative complications, and the patient achieved complete recovery with no sensory or motor dysfunction. Histopathological findings confirmed a mucoid pseudocyst. Left leg pain post-surgery disappeared immediately after surgery.

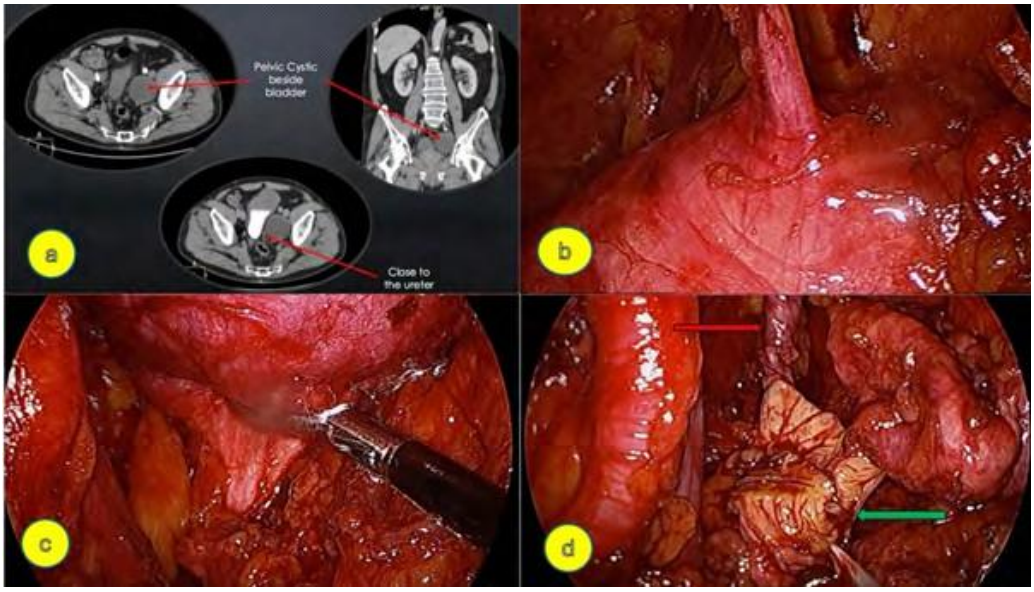


**Figure 1**: a- CT scan showing a cystic lesion close to the ureter and iliac artery; b- Caudal portion of the obturator nerve; c- Cephalic portion of the nerve; d- Obturator nerve Cystic resected preserving the nerve (red narrow).

## 6. Discussion

Pelvic cysts represent a challenge, especially in women given the presence of ovarian cysts. Among various etiologies, peripheral nerve injuries are the less common and usually found incidentally during imaging studies or in patients with chronic pelvic pain. Primary ON pathologies such as schwannomas, perineuromas, ganglion cysts intra or extraneural, and even malignant lesions have been reported. Panwar et al. analyzed 245 magnetic resonances (MRI) in a cohort of patients with nerve palsy affecting different peripheral nerves 3. Among the cystic lesions, they evaluated some parameter that optimizes the diagnostic accuracy between intra- or extraneural ganglion as well as other cystic pathologies. From the total MRI, 45 (18%) were intra or extraneural with 13 (28.8%) being intraneural. The rest were extraneural cysts, schwannomas or neural abscesses related to Hansen's disease. Main clinical presentation was pain along the affected nerve and muscle weakness over the innervated area. Gleason et al. published a case with a presumptive diagnosis of ovarian cyst based on clinical manifestation and imagines 4. Due to the persistent pain and cystic growth, an exploratory laparotomy was performed, revealing that the lesion originated from the ON. After resection and nerve preservation, histopathology confirmed a Schwannoma, and two months later, pelvic pain subsided without motor involvement. Lima Pompeo et al. reported a schwannoma affecting the ON successfully resected using a laparoscopic approach [5]. Clinical manifestation was pain over the right lower limb with a CT scan revealing the presence of a cystic mass within in the obturator fossa. They were able to achieve complete resection while preserving the nerve, assisted by laparoscopic visualization. Finally, Uchida et al. [6]. Published a case of a mucoid pseudocyst of the ON 6 like our current publication. However, the cystic need to be removed by a conventional approach due to the compromised of the ON and obturator artery. Although the patient did not recover motor function, the pain resolved completely. Mucoid pseudocysts of the ON are extremely rare, with one case reports6. These are originated from a degenerative lesion of peripheral nerves without a clear etiology. Diagnosis and treatment were aided by laparoscopy; although, the definitive diagnosis is histopathological. We believe that laparoscopy allowed more view details and facilitate complete resection of the cyst while preserving the supporting structures (axonotmesis).

Usually, urologists are not familiar with nerve injuries and less how to manage. It is of utmost importance to know how to treat them even if the nerve is involved, to repair it. ON injury may be more prevalent during lymphadenectomies in gynecological or urological surgeries; however, we supposed that iatrogenic injuries are under published. Menders et al. reported an iatrogenic ON injury during a laparoscopic pelvic lymphadenectomy and immediately repaired with a tension free primary anastomosis [7]. The patient exhibited no adductor dysfunction postoperatively. Burbano-Luna et al. also published an ON injury and reviewed the literature [8]. It occurred during a laparoscopic pelvic lymphadenectomy using bipolar energy, which was repaired immediately by an end-to-end anastomosis using non-absorbable suture. The electromyogram showed the alteration over the lower limb but with signs of nerve conduction. At 12 months the symptoms had disappeared, motor and sensory. In their review, identified 13 case reports, the vast majority were repaired during the surgical procedure, while one case was repaired after 9 months. Surgical techniques were primary anastomosis or a sural nerve graft. After 12-month follow-up, two patients presented paresthesia over the limb while three patients had deficits in leg adduction movements. The authors concluded that primary anastomosis, especially when performed immediately, presents excellent results in the resolution of symptoms at the 12-months. Use sural nerve is an alternative described previously by Dias et al. [9]. When complete section cause nerve retraction, hindering primary anastomosis, so it is necessary to use sural nerve graft that allows a tension free anastomosis.

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