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**Case Report / Приказ болесника**

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**Guyon's canal syndrome caused by space-occupying lesions – a two-case  
report**

**Синдром Гионовог канала – приказ два случаја узрокована компресивним  
лезијама**

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## Guyon's canal syndrome caused by space-occupying lesions – a two-case report

### Синдром Гионовог канала – приказ два случаја узрокована компресивним лезијама

#### SUMMARY

**Introduction** Guyon's canal syndrome (GCS) is a rare compressive neuropathy, accounting for less than 1% of upper extremity neuropathies. While traumatic, inflammatory, or idiopathic causes are more common, tumor-related lesions remain an uncommon etiology. The objective of this report is to present two cases of GCS caused by space-occupying tumorous formations and to emphasize the importance of early diagnosis and surgical intervention.

**Case outline** The first case involves a 60-year-old civil engineer diagnosed with a benign cystic lesion within Guyon's canal. The second case describes a 55-year-old editor with a lipomatous mass in the same region. Both patients developed progressive hand muscle weakness and sensory impairment. Magnetic resonance imaging and ultrasound confirmed ulnar nerve compression, while electrophysiological studies revealed severe neurogenic damage. Surgical excision of the lesions resulted in marked symptom improvement, and both patients achieved complete functional recovery.

**Conclusion** These cases demonstrate that surgical decompression of Guyon's canal in tumor-related compressions provides excellent outcomes. Timely diagnosis and an individualized therapeutic approach are crucial to prevent permanent nerve damage.

**Keywords:** Guyon's canal syndrome; ulnar nerve; cyst; lipoma; surgery

#### САЖЕТАК

**Увод** Синдром Гионовог канала (ГЦС) представља ретку компресивну неуропатију, која чини свега око 1% неуропатија горњег екстремитета. Најчешћи узроци су трауматске, инфламаторне или идиопатске природе, док су туморске промене као етиолошки фактор ретке. Циљ овог рада је да прикаже два случаја ГЦС изазвана туморским формацијама и да нагласи значај ране дијагностике и хируршког лечења.

**Приказ болесника** Први случај се односи на 60-годишњег грађевинског инжењера код кога је дијагностикована бенигна цистична лезија унутар Гионовог канала. Други случај описује 55-годишњег уредника са липоматозном масом у истој регији. Код оба пацијента примећена је прогресивна слабост мишића шаке и сензорна дисфункција. Магнетна резонанца и ултразвук потврдили су компресију улнарног нерва, док су електромионеурографска испитивања показала изражено неурогено оштећење. Након хируршке ексцизије лезија, дошло је до значајног побољшања симптома, а оба пацијента су постигла потпуни функционални опоравак.

**Закључак** Приказани случајеви потврђују да хируршка декомпресија Гионовог канала код компресије изазване туморским лезијама доводи до одличних резултата. Правовремена дијагноза и индивидуализован терапијски приступ кључни су за превенцију трајног оштећења нерва.

**Кључне речи:** синдром Гионовог канала; улнарни нерв; циста; липом; хирургија

#### INTRODUCTION

Guyon's Canal Syndrome (GCS) is a relatively rare peripheral neuropathy resulting from compression of the ulnar nerve as it traverses through Guyon's canal at the wrist. This condition can lead to significant motor and sensory impairments in the hand, often leading to functional limitations. The ulnar nerve, originating from the C8-T1 nerve roots, travels through the arm and forearm and finally enters the wrist through Guyon's canal, a narrow space where it is particularly vulnerable to compression [1]. Understanding the anatomy and potential causes of compression is crucial for diagnosing and managing GCS effectively. Guyon's canal is a narrow fibro-osseous tunnel located at the wrist, bordered by the volar carpal ligament, transverse

carpal ligament, pisiform, pisohamate ligament, and the hook of hamate [2]. The confined nature of this space makes the ulnar nerve susceptible to compression, which can affect both motor and sensory branches, leading to a variety of symptoms depending on the specific site and degree of compression [3].

The clinical presentation of GCS varies, with symptoms ranging from sensory disturbances in the small and ring fingers to motor deficits affecting hand strength and dexterity. Shea and McClain's classification system categorizes GCS into three types: Type I involves both motor and sensory deficits, Type II involves isolated motor deficits, and Type III involves isolated sensory deficits [4]. Differentiating GCS from other ulnar neuropathies, such as cubital tunnel syndrome, is essential for appropriate management. The causes of GCS include anatomical anomalies, space-occupying lesions such as ganglion cysts or lipomas, trauma, and systemic conditions like rheumatoid arthritis and diabetes [5]. Trauma, particularly repetitive wrist movements or fractures, is a common cause of GCS, especially in athletes and workers engaged in manual labor [6]. Pathological conditions affecting Guyon's canal include those specific to this region, such as calcific tendinopathy of the flexor carpi ulnaris tendon, hypothenar hammer syndrome (HHS), and accessory abductor digiti minimi, as well as conditions that can occur elsewhere in the body, such as ganglion cysts, neuromas, lipomas, and tenosynovial giant cell tumors, according to recent publication tumors have leading role. These factors contribute to the compression of the ulnar nerve within Guyon's canal, leading to the clinical manifestations of GCS. However, space-occupying lesions such as ganglion cystitis and lipomas represent an important but less frequent cause. Recent evidence highlights their clinical relevance in surgically treated cases.

Diagnosis involves a combination of clinical evaluation, imaging studies like magnetic resonance imaging (MRI) and ultrasound, and electrophysiological testing to determine the

location and extent of nerve compression [7]. Treatment options vary depending on the severity of symptoms and may include conservative measures such as splinting and activity modification or surgical interventions aimed at decompressing the nerve [8]. Early diagnosis and intervention are critical to prevent permanent nerve damage and optimize functional recovery.

## CASE REPORTS

### Case Presentation 1

A 60-year-old right-handed male, employed as a civil engineer, presented with a progressive history of symptoms over several months, with marked worsening in the last two months. The patient reported increasing weakness in the muscles of his right hand, noticeable atrophy of the hypothenar muscles, and weakness in the fingers of his right hand. Additionally, he experienced discomfort and pain when placing weight on his right hand and forearm (Figure 1).

The patient underwent neurological evaluation, including ultrasound and MRI of the right hand and wrist, which revealed a cystic lesion in the region of the hypothenar and Guyon's canal, leading to compression of the ulnar nerve (n. ulnaris) and resulting in hypotrophy of the intrinsic muscles and hypothenar region. Consequently, the patient was referred to a plastic surgeon for surgical intervention consideration.

As part of the preoperative preparation, electroneurography (ENR) was performed, demonstrating clear signs of current and severe neurogenic lesions in the first, second, third, and fourth dorsal interosseous muscles, along with significant signs of denervation. In the hypothenar muscles, moderate to severe signs of current neurogenic lesions were also noted. The patient was classified as Type I Guyon's canal syndrome (Shea and McClain

classification).

Following adequate preoperative preparation, the patient underwent surgery under regional block anesthesia with tourniquet control. During the procedure, the structures of Guyon's canal were identified, and the cystic lesion was excised (Figure 2). A careful dissection was performed with identification and protection of the ulnar nerve and its branches. Pathohistological examination confirmed the lesion as a benign cystic formation. Figure 3. demonstrates the intraoperative macroscopic appearance of the lesion.

## Case Presentation 2

A 55-year-old right-handed male, employed as an editor, presented with a two-year history of discomfort in the left hand, characterized by pain in the wrist area and mild to moderate weakness in the fingers of the left hand. The patient also reported a painful swelling in the wrist region of the left hand (Figure 4).

An ultrasound examination of the soft tissue structures of the wrist was conducted, revealing a lipomatous lesion in the hypothenar region and Guyon's canal, with compression of the ulnar nerve (n. *ulnaris*) and resulting in hypotrophy of the intrinsic muscles and hypothenar region. Following this diagnosis, the patient was referred to a plastic surgeon for surgical treatment consideration. After appropriate preoperative preparation, the patient underwent surgery under regional block anesthesia with tourniquet control. During the procedure, the structures of Guyon's canal were identified, and the lipomatous lesion was excised (Figure 5). A careful dissection was performed with identification and protection of the ulnar nerve and its branches. Pathohistological examination confirmed the diagnosis of a lipoma and Figure 6 shows the intraoperative macroscopic appearance of the lipoma. Lipoma is one of the most common benign tumors that is composed of mature adipocytes. Lipoma rarely causes neuropathy. Very

few cases of ulnar nerve entrapment resulting from lipoma in the Guyon's canal have been reported in the literature.

Both patients were followed for 24 months postoperatively, demonstrating complete functional recovery.

Both patients achieved full recovery and showed significant improvement at 6, 12 months and then 24 months post-operatively. There were greater improvements in grip strength, pinch strength, digit abduction, and self-reported Michigan Hand Outcomes Questionnaire (MHQ) performance in hand function. Postoperative rehabilitation included supervised hand therapy, range-of-motion exercises, strengthening, and sensory rehabilitation.

Both patients provided written informed consent for the publication of their clinical data and accompanying diagnostic images. All identifying information has been removed to ensure patient confidentiality.

## DISCUSSION

The two cases presented demonstrate the diversity of etiologies that can lead to GCS and highlight the importance of thorough diagnostic evaluation. The first case involved a cystic lesion compressing the ulnar nerve, while the second case involved a lipomatous mass. These findings align with the broader literature and other studies, like those by Wang et al., that identifies space-occupying lesions, such as ganglion cysts, as a significant cause of GCS [9]. Similarly, although less common, lipomas have also been reported as contributors to ulnar nerve compression within Guyon's canal [10], but Guyon's canal syndrome caused by lipoma is an extremely rare condition.

Surgical intervention in both cases resulted in significant symptom relief, consistent with findings from John et al., who reported favorable outcomes following early surgical decompression in patients with severe motor deficits due to GCS [11]. The importance of early intervention is further underscored by Posner, who highlighted the risk of irreversible nerve damage and poor functional recovery if treatment is delayed [12]. This emphasizes the need for early diagnosis and appropriate surgical management to prevent long-term complications.

Epidemiologically, GCS is relatively rare compared to other ulnar neuropathies, such as cubital tunnel syndrome. It accounts for approximately 1% of all compressive neuropathies of the upper extremity [6, 7,]. The condition is particularly prevalent among individuals engaged in activities involving repetitive wrist movements, such as cyclists and manual laborers, which can lead to chronic microtrauma and subsequent nerve compression [13, 14]. This underscores the importance of considering occupational and activity-related factors in the diagnosis and management of GCS.

In both cases, imaging studies, particularly MRI and ultrasound, were pivotal in identifying the underlying causes of nerve compression and guiding surgical planning. Hoogvliet et al. [15] advocate for the use of advanced imaging techniques in diagnosing and managing GCS, highlighting their role in improving diagnostic accuracy and treatment outcomes. [15, 16] The cases discussed illustrate the importance of early diagnosis and tailored intervention, particularly in instances involving space-occupying lesions. Continued research and increased clinical awareness are necessary to optimize treatment strategies and improve outcomes for patients with GCS. By integrating anatomical insights with advanced imaging techniques, clinicians can enhance patient outcomes and preserve hand function, emphasizing the need for increased awareness and research in this often-neglected area of hand anatomy. [16, 17, 18].

## CONCLUSION

These two cases emphasize that space-occupying lesions, although rare, should be considered in the differential diagnosis of Guyon's canal syndrome. Early recognition, appropriate imaging, electrophysiological assessment, and timely surgical decompression may result in excellent functional recovery and prevent irreversible ulnar nerve damage. These cases highlight the clinical importance of individualized diagnosis and surgical management in daily practice.

**Conflict of interest:** None declared.

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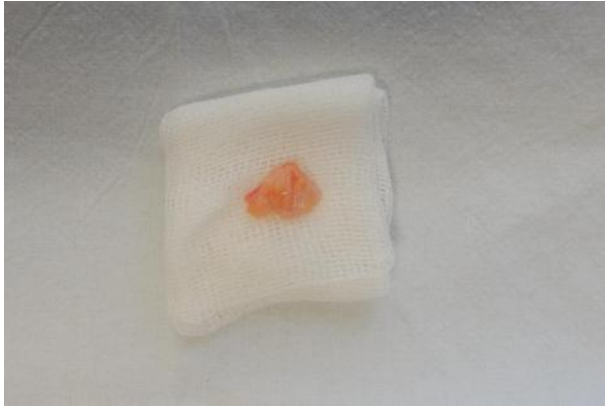


**Figure 1.** Atrophy of the hypothenar muscles, and of the fourth and fifth fingers of the right hand



**Figure 2.** Intraoperative findings

Paper accepted



**Figure 3.** Intraoperative macroscopic appearance of excised cystic lesion

Paper accepted



**Figure 4.** Atrophy of the hypothenar muscles, and of the fourth and fifth fingers of the left hand



**Figure 5.** Intraoperative findings

Paper accepted



**Figure 6.** Intraoperative macroscopic appearance of excised lipoma