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PREVALENCE OF GUYON'S CANAL SYNDROME AND IT'S ASSOCIATION WITH HAND GRIP AND PINCH GRIP STRENGTH AMONG WEIGHT LIFTERS

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Article Info

Abstract

Background: Guyon's Canal Syndrome (GCS), caused by ulnar nerve compression at the wrist, may affect weightlifters due to repetitive grip demands. This cross-sectional study investigates the prevalence of GCS and its association with hand and pinch grip strength among weightlifters in Karachi.

Objectives: To determine the prevalence of Guyon's Canal Syndrome among weightlifters using the PRUNE scale and evaluate its association with hand grip and pinch grip strength measured by a hand-held dynamometer.

Methodology: This cross-sectional study included 258 weightlifters from gyms in Karachi who completed the 19-item PRUNE questionnaire to assess symptoms related to grip strength. Pain and task difficulty were rated on scales from 0–10, while hand grip and pinch grip strength were objectively measured using dynamometers.

Results: The study found Guyon's Canal Syndrome to be more prevalent in male weightlifters (67.8%) than females (32.2%). Significant associations were observed between discomfort and hand grip strength ($p = 0.033$), as well as pinch grip strength and PRUNE components ($p = 0.012$).

Conclusion: Our study shows that Guyon's Canal Syndrome is common among weightlifters, especially men, which shows how important it is to prevent and properly manage the condition. The PRUNE scale worked well in measuring pain and how much it affects daily activities, which helps improve the way healthcare is provided and the results for athletes.

Keywords: *Guyon's Canal Syndrome, hand grip strength, pinch grip strength, weightlifters, ulnar nerve compression.*

Introduction

The annual incidence of upper extremity injuries in commercial and civilian work is between 21.1% and 25.3%, and the two most common diseases are carpal tunnel syndrome and cubital tunnel syndrome. Ulnar nerve (FN) entrapment in Guyon's tunnel is very rare, and cubital tunnel entrapment is estimated to occur in one in twenty. Guyon's canal syndrome (GCS) is considered the most common type of wrist syndrome after palmar tunnel syndrome. The exact cause of Guyon's tunnel syndrome is unknown due to lack of research. Although it has some consequences for ordinary people, being trapped in Guyon's tunnel is sometimes called "biker's palsy" or "hand paralysis", but it seems very distant from a distance. Patterson et al. found that 36% (n = 25) of cyclists developed BM symptoms after a long race. So when the BM condition is closed in Guyon, the probability of this in the population is low, and the condition is higher in some patient groups (Recarhoff et al., 2015). Then divide the horoscope into three spokes: then the inner spokes take the outer and inner kings. The ulnar nerve is located on the medial side of the brachial artery in the upper arm, up to the wrist and then to the arm. Above the Guyon canal. . In the ulnar canal, the nerve divides into two branches: the deep branch, responsible for motor function, innervates the abductor digiti minimi, the interosseous muscles and some muscles of the thumb, the interosseous muscles and other muscles responsible for the strength of the body; the deep branch, responsible for motor function, innervates the abductor digiti minimi, the interosseous muscles, the interossei and part of the thumb, the interossei muscle of the thumb and the superficial ramus, providing sensory innervation to the fourth and fifth fingers and the hypothenar region of the hand. In addition, the ulnar nerve, as well as the ulnar nerve, is in the Guyon canal. (Katarzyna Kopcik et al., 2023)

Unlike carpal tunnel syndrome, GKS is a rare mononeuropathy affecting the upper extremity, especially the ulnar nerve. This syndrome is caused by damage to the ulnar nerve distal to the wrist. Paralysis is the result of nerve loss, including hearing, motor or functional impairment, due to the compression of blood vessels from surrounding structures. It can also be caused by swelling of the nerves due to anatomical limitations, causing compression (Katarzyna Kopcik et al. 2023)

Compression or compression of the ulnar nerve at the level of the Guyon canal in the wrist means Guyon disease. Canal Syndrome (GCS) is a well-known but rarely treated condition. It is also called Ulnar Tunnel Syndrome or Guyon Tunnel Syndrome. GCS can be a serious, chronic condition that is difficult to diagnose and treat because the artery is a network of arteries and veins located in different parts of the body. (Janet M. Mulholland et al. 2018)

Where peripheral nerves pass through joints, they often pass through bundles of fibers that help stabilize and prevent movement during movement progression. However, these channels can still be affected by external factors. Initially, blood vessels can become re-inflamed, leading to ischemia and irreversible internal scarring, leading to fibrosis. For example, Guyon's canal (GC) is characterized by several rigid ligaments that can penetrate the ulnar nerve, especially the carpal ligament that forms the upper border of the nerve. In resistant cases, surgical decompression is required. The position of the wrist is thought to affect the internal stress on the ulnar and median nerves, affecting the stimulation of the ulnar nerve, which is thought to be at risk of stroke, especially in cyclists who hold the bars low. Anatomical variations such

as accessory muscles near the GC can also cause nerve entry, and studies have shown that these muscles can push the ulnar nerve towards the Piso hamate ligament during contractions, as well as the importance of thinking about emotions in pregnancy.

The causes of Guyon's Canal Syndrome (GCS) include many factors, especially soft tissue and fat, especially ganglia, which constitute 30-40% of patients, especially those that show up as a result of testing from the anterior triangle joint. Medical conditions such as repetitive work vibration injuries from tools such as jacks or power tools, fractures, burns, damaged muscles, fibrous tissue, diseases, and arthritis from wrist surgery and iatrogenic injuries can cause GCS. The ulnar artery, another important structure in Guyon's canal, can also cause GCS, especially from an aneurysm. Thrombosis and pseudoaneurysm formation (possibly due to vascular injury) can be detected by color and doppler ultrasound techniques. Hypothenar hammer syndrome results from direct injury to the ulnar nerve. Activities that require prolonged wrist contact, such as handicrafts, golf, or racquetball, that do not involve pressure applied to the face, have also been associated with GC. (Janet M. Mulholland et al., 2018)

Other causes of ulnar nerve compression in Guyon's canal include, but are not limited to, ganglion cysts, lipomas, muscle abnormalities, or hypoplastic bone. The ulnar nerve divides into two terminals as it passes through Guyon's canal: the deep branch of the ulnar nerve and the external ulnar nerve. The deep nerves control movement of the muscles of the hand, including the dorsal and palmar muscles of the hand, the lumbrical muscles of the fourth and fifth fingers, the hypothenar muscles (abductors, flexors, and opposers of the little finger), and the medial pollicis muscle adductor and digit minimi muscles. The superficial ulnar nerve supplies sensory innervation to the hypothenar process, the palmar surface of the fifth finger, and the two metacarpodigital nerves adjacent to the fourth and fifth fingers. (Courtney K. Brown et al., l 2014)

Hypothenar hammer syndrome (HHS) is a unique mechanism of ulnar nerve injury secondary to ulnar artery thrombosis or aneurysm, causing swelling of the ulnar nerve in Guyon's canal and subsequent damage to the ulnar nerve. The etiology of hypothenar hammer syndrome is similar to Guyon's canal syndrome; repeated trauma to the hypothenar region eventually damages the ulnar nerve. ((Aleksenko D et.al 2017)

Therefore, GCS patients may encounter various diagnoses and symptoms, including more elbow symptoms, third and fourth lumbrical muscles and interosseous muscles, and symptoms that may overlap with ulna tear. There may be weakness in the grip of the little finger (called Wattenberg's ulnar nerve sign) or the middle and middle fingers may be crossed. 6 Tactile side effects may include pain and paresthesia in the little and ulnar part of the index finger and in the hypothenar process. The muscles involved in grip are supplied by the ulnar nerve, so any decrease in strength, squeezing and grasping, and manual techniques can cause serious damage to patients, including discomfort and physical effects such as skin changes and tenderness. Muscle atrophy and the appearance of ulnar claws occur after the results of treatment. Carpal tunnel syndrome (CTS) occurs simultaneously with GCS, but the cause may be different because there are no ligaments or bursae connecting the nerves and capable of expansion in the GC. Mulholland et al. 2018)

The diagnosis of Guyon's Canal Syndrome and Handlebar Paralysis is based primarily on the evaluation of the patient's symptoms. Symptoms usually include numbness or tingling affecting the back and fourth and fifth fingers, and loss of motor skills. Various tests can be performed to diagnose Guyon's Canal Syndrome (GCS): The Tinel test involves touching the nerve pathway and asking the patient if it is uncomfortable. Fromen syndrome is characterized by the patient holding a piece of paper between the thumb and palm and the doctor trying to remove it. The aim of Wattenberg is to move the fifth finger away from the other. Radiological evaluation often requires an MRI scan of the hand or cervical spine to exclude abnormalities in Guyon's canal or cervical roots, particularly C7-8 for T1, especially in patients with atypical neurologic symptoms or unexplained motor or sensory deficits. Hand electromyography (EMG) is another useful diagnostic tool. Electromyographic findings have classified Guyon's canal syndrome into three types: Type I, involving activity of all muscles innervated by the ulnar nerve. Hand muscle denervation of the smallest muscles. Type III, showing normal nerves in all muscles innervated by the ulnar nerve. Guyon's canal syndrome and handlebar palsy usually resolve spontaneously over time. Treatment for Guyon's canal syndrome includes antibiotics, such as antibiotics or non-steroidal anti-inflammatory drugs, immobilization of the wrist and hand, or, preferably, steroid injections under ultrasound guidance. However, healthcare often fails to adequately relieve patients' symptoms. Surgery is the main option for treating veins, especially when conservative treatment is not possible or when an organic cause is suspected. Post-operative complications, although rare, include nerve damage, infection, scarring or keloid formation, and blood vessel problems such as thrombophlebitis. It is important to consider the risks of surgery. If a cyclist stops riding for a few months, the handlebar palsy almost completely heals. Preventive measures include wearing padded riding gloves, changing hands frequently, and using handlebars that support your upper body against your forehead instead of your wrists. (Katarzyna Kopcik et al. 2023)

The choice of care and surgical treatment depends on factors such as the duration and severity of symptoms and the specific cause identified. For example, in people who play high-level sports, such as basketball, damage to the hamate bone may occur due to sudden or repeated trauma during sports. In such cases, surgery is usually recommended, which allows return to play within 3 to 4 weeks, and the person is patient. (Aleksenko D et.al 2017)

The treatment method for Guyon's Canal Syndrome is similar to that for Carpal Tunnel Syndrome. Treatments range from conservative to surgical interventions. Medical care usually depends on the patient's education and the use of splints. Patients, especially cyclists, are advised to avoid activities that increase pressure on the Guyon's tube and to choose a more ergonomic position. It is also important to minimize repetitive or prolonged wrist extensions, as this can damage the ulnar nerve in the hand. (Aleksenko D.V.Ark., 2017)

Guyon's Canal Syndrome due to overuse is associated with prolonged flexion or extension of the wrist and repetitive stress to the hypothenar eminence. Behavioral changes may help reduce Guyon's Canal Syndrome due to work-related injuries. Early detection of treatable causes and prompt intervention may reduce symptoms and preserve function. Studies have shown that approximately 10% of individuals with

work-related symptoms, particularly those who use computers, have a positive Tinel sign in Guyon's canal. The lack of specific diagnostic criteria and reliance on history make it difficult to make a clinical decision without further investigation. (Jeffrey CY Chan et al., 2008)

Grip strength and pinch strength are two of the most important aspects of hand control. A number of studies have been conducted recently to measure grip and pinch strength and to reveal the importance of different age groups. Since some of these studies examined how different factors affect grip strength and pinch strength, some of these studies can provide a model for measuring two body parts. Grip and pinch strength can be affected by many variables such as hand (right or left), body, arm angle, age, height, weight, and finger length. According to some studies, more grip strength can be achieved with fewer arm joints. To date, many studies have been conducted to evaluate how hand control affects grip and grip strength. Many studies have been conducted to evaluate the relationship between muscle mass and body weight. While some of these studies found a correlation between the two behaviors, some found a positive relationship, other studies found no relationship between muscle mass and body weight. (Habibi, Ehsanollah, et al., 2013)

Hand grip strength can be measured using simple, safe, and accurate methods that do not require expensive or complicated equipment. Therefore, a simple and user-friendly tool, the hand dynamometer, is needed to measure muscle strength. Grip strength is associated with features such as poor muscle function and function in the elderly. It can also be associated with problems such as general weakness, diet, physical activity, muscle weakness, activities of daily living, low cognitive decline and total mortality. Physical activity is a variable that can affect muscle mass and therefore maintain its value. Among the relevant studies, it is worth mentioning Bautman's study, which examined the effects of fatigue, physical activity and many other negative factors on the maintenance of strength and pinch strength value. (Habibi, Ehsanollah, et al., 2013)

Methodology

This cross-sectional observational study was conducted to determine the prevalence of Guyon’s Canal Syndrome among weightlifters and to identify its relationship with hand grip and pinch grip strength. The study was performed in different gymnasiums of Karachi, Pakistan. The target population included young adult weightlifters who were actively participating in resistance training exercises. Both male and female participants between 18 and 30 years of age were included in the study. The research was completed over a period of one year after approval from the relevant academic department.

The sample size for this study was calculated by using OpenEpi software with reference to a previously published study related to Guyon’s canal abnormalities. According to the statistical calculation, a minimum sample size of 255 participants was obtained. A non-probability convenience sampling technique was used because participants were selected according to their accessibility and willingness to participate during visits to different gym settings. Before participation, all individuals were informed about the purpose and procedure of the study, and written informed consent was obtained from each participant.

Participants were included if they had been regularly involved in weightlifting training for at least six months. Individuals reporting symptoms such as wrist discomfort, difficulty during gripping activities, tingling sensations, numbness, or weakness around the wrist and hand region were considered eligible for inclusion. Both males and females fulfilling the required age criteria were enrolled in the study. However, individuals with severe systemic diseases including cardiovascular disorders, renal disease, or carcinoma were excluded. Participants with a recent history of wrist fracture, trauma, surgical intervention, or any condition unrelated to weightlifting that could affect hand function were also excluded from the research to maintain accuracy of the findings.

Data collection was carried out using the Patient-Rated Ulnar Nerve Evaluation (PRUNE) questionnaire along with a hand-held dynamometer. The PRUNE questionnaire is a structured assessment tool used for evaluating symptoms and functional limitations associated with ulnar nerve involvement. It contains 20 items divided into different domains including pain, sensory and motor symptoms, specific activities, and usual functional activities. Each item is scored numerically, and higher scores indicate greater severity of symptoms and reduced functional performance. The questionnaire was selected because it provides a detailed assessment of clinical symptoms related to Guyon's Canal Syndrome.

Hand grip and pinch grip strength were measured by using a hand-held dynamometer under standardized conditions. Prior to testing, participants were given proper instructions regarding the procedure to ensure consistency during measurements. Participants were asked to perform maximum voluntary effort while grip and pinch readings were recorded carefully. The dynamometer provided quantitative measurements of hand muscle strength and functional performance among weightlifters. To improve reliability, measurements were recorded attentively and all participants were assessed in a similar environment.

The data collection process was conducted through direct interaction with participants in gym facilities. After obtaining consent, demographic details and clinical history were recorded. Participants then completed the PRUNE questionnaire under supervision so that any confusion regarding the questions could be clarified immediately. Following questionnaire completion, hand grip and pinch grip strength were assessed using the dynamometer. All forms were reviewed after data collection to reduce missing information and ensure proper documentation before statistical analysis.

The collected data were entered and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics including frequency, percentage, mean, and standard deviation were used to summarize demographic information and study variables. Inferential statistics were applied to determine the association between Guyon's Canal Syndrome and grip strength variables. Chi-square tests were used to assess the relationship between PRUNE scoring categories and both hand grip and pinch grip strength. A p-value less than 0.05 was considered statistically significant.

Ethical principles were followed throughout the research process. Confidentiality and privacy of all participants were maintained, and participation remained voluntary. Participants were informed that they had the right to withdraw from the study at any stage without facing any penalty or negative consequences.

Results

The final sample for this cross-sectional study comprised 258 participants within the 18-to-30 age cohort, consisting of 175 males (67.8%) and 83 females (32.2%). Analysis revealed a higher prevalence of Guyon's Canal Syndrome among male weightlifters than their female counterparts, with the condition being linked to deficits in both hand grip and pinch grip strength—a decline that was notably more pronounced in male participants. (Table I and II)

Table I: Age of participants

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20	49	19.0	19.0	19.0
	21-23	79	30.6	30.6	49.6
	24-26	65	25.2	25.2	74.8
	27-30	65	25.2	25.2	100.0
	Total	258	100.0	100.0	

Table II: Frequency of Male and Female

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	175	67.8	67.8	67.8
	FEMALE	83	32.2	32.2	100.0
	Total	258	100.0	100.0	

Symptom severity and functional impact were quantified using the Patient-Rated Ulnar Nerve Evaluation (PRUNE) scale, where the majority of the cohort presented with mild symptoms across all evaluated domains. Specifically, mild pain was reported by 217 participants (84.1%), while 34 (13.2%) and 7 (2.7%) reported moderate and severe pain, respectively. (Table III and Figure I)

Table III: Pain scoring

Pain Scoring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mild Pain	217	84.1	84.1	84.1
	Moderate Pain	34	13.2	13.2	97.3
	Severe Pain	7	2.7	2.7	100.0
	Total	258	100.0	100.0	

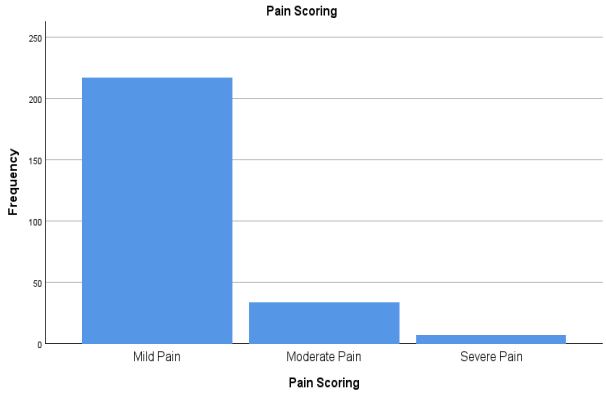

Figure I: Pain Scoring

Similarly, specific hand function impairment was classified as mild for 221 individuals (85.7%), moderate for 35 (13.6%), and severe for 2 (0.8%). (Table IV and Figure II)

Table IV: Sensorimotor Scoring

SpecificFunctionScoring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mild	221	85.7	85.7	85.7
	Moderate	35	13.6	13.6	99.2
	Severe	2	.8	.8	100.0
	Total	258	100.0	100.0	

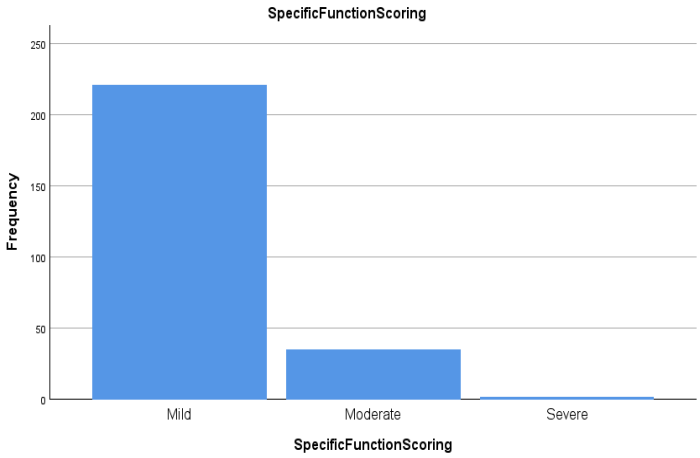

Figure II: Specific Function Scoring

Sensorimotor assessment identified mild deficits in 208 participants (80.6%) and moderate deficits in 42 (16.3%), while severe and extremely severe impairments were equally distributed, with 4 participants (1.6%) falling into each category.

Table V: Sensorimotor Scoring

Sensorimotor Scoring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mild	208	80.6	80.6	80.6
	Moderate	42	16.3	16.3	96.9
	Severe	4	1.6	1.6	98.4
	Extremely Severe	4	1.6	1.6	100.0
	Total	258	100.0	100.0	

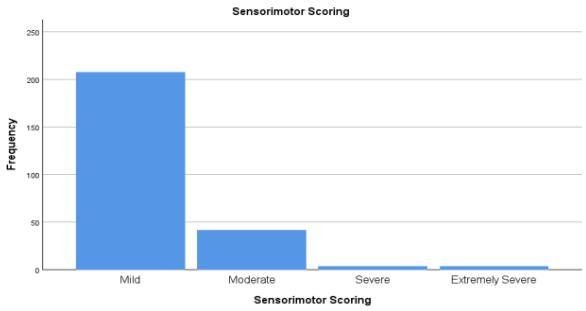

Figure III: Sensorimotor Scoring

Furthermore, routine tasks were mildly disrupted for 194 participants (75.2%), moderately disrupted for 43 (16.7%), severely disrupted for 15 (5.8%), and extremely severely disrupted for 6 (2.3%). (Table VI and Figure IV)

Table VI: Usual Activity Scoring

Usual Activity Scoring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mild	194	75.2	75.2	75.2
	Moderate	43	16.7	16.7	91.9
	Severe	15	5.8	5.8	97.7
	Extremely Severe	6	2.3	2.3	100.0
	Total	258	100.0	100.0	

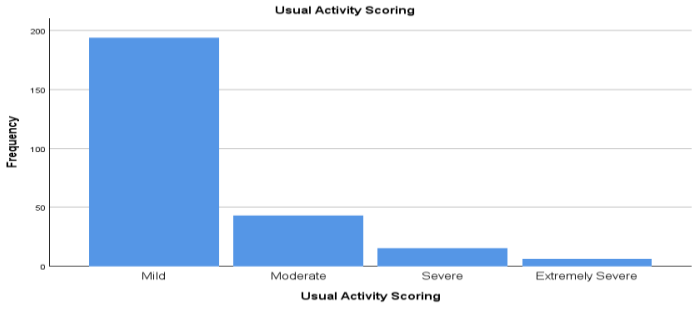

Figure IV: Usual Activity Scoring

Normality testing indicated that the continuous variables violated the assumption of normal distribution, requiring the use of non-parametric Chi-square tests to evaluate the relationships between grip strength metrics and the various PRUNE subscales. Pinch grip strength demonstrated a profound deviation from

normality, characterized by marked positive skewness (6.993) and a highly elevated kurtosis value (64.856), whereas hand grip strength displayed a relatively symmetrical distribution, exhibiting only minor departures from normality (skewness = 0.202; kurtosis = 3.746.

The subsequent Chi-square analysis revealed statistically significant associations ($p < 0.05$) between both hand grip and pinch grip strength and every subscale of the PRUNE instrument, including pain, specific function, sensorimotor function, and usual activities. These outcomes collectively demonstrate that diminished grip strength is robustly linked to heightened symptom severity and greater overall functional limitations in individuals diagnosed with Guyon's Canal Syndrome. (Table VII)

Table VII: Statistics

Statistics

		RHGTotal	LHGTotal	RPGTotal	LPGTotal
N	Valid	258	258	258	258
	Missing	0	0	0	0
Mean		75.67	64.09	16.99	14.35
Std. Deviation		26.377	20.798	7.035	12.249
Minimum		11	14	6	7
Maximum		321	106	73	180

Discussion

Guyon's Canal Syndrome (GCS) arises from the entrapment of the ulnar nerve as it passes through the fibro-osseous tunnel at the wrist, manifesting as sensorimotor deficits across the hand. Pathological hallmarks typically include paraesthesia, hypesthesia, diminished muscular capacity, and impaired fine motor control. Left unmanaged, chronic nerve compression can precipitate intrinsic muscle atrophy and profound functional limitations. Athletes, specifically weightlifters, exhibit heightened vulnerability to this condition due to the intense, repetitive mechanical stress and sustained gripping required during resistance training.

In this study, a disproportionately higher prevalence of GCS was observed among male weightlifters (67.8%) relative to female participants (32.2%). This demographic distribution aligns with existing literature, which documents an increased susceptibility to compressive neuropathies among male strength athletes. This trend is largely attributed to the compounding effects of heavier repetitive loading, prolonged isometric gripping, and elevated intra-canal pressure during maximum exertion maneuvers. The concomitant reductions in both gross hand grip and fine pinch grip strength identified in this study pose a dual threat, potentially undermining both competitive athletic performance and the execution of basic activities of daily living.

Evaluation via the Patient-Rated Ulnar Nerve Evaluation (PRUNE) scale indicated that the symptomatic burden for the vast majority of the sample was relatively mild. Mild pain was reported by 84.1% of the cohort, with moderate or severe pain manifesting far less frequently. This trend toward sub-acute severity was similarly reflected in the specific hand function, sensorimotor, and routine activity domains. While

these data indicate that most affected individuals maintain the capacity to perform daily tasks, they also underscore a critical clinical point: early-stage ulnar neuropathy still subtly degrades hand functionality and overall quality of life. If these initial manifestations are ignored, the condition may progress to more debilitating stages.

The clinical utility of the PRUNE scale was validated in this study as an effective tool for tracking pain trajectories, neurological deficits, and functional constraints specific to GCS. These observations corroborate prior research advocating for the integration of patient-reported outcome measures to pinpoint early impairments and construct targeted rehabilitation protocols. To mitigate the progression of GCS and optimize recovery outcomes in weightlifting populations, early diagnostic screening must be paired with proactive interventions. These strategies should encompass ergonomic adaptations (such as modified bar grips), targeted hand and wrist conditioning, and coaching on proper lifting biomechanics to minimize unnecessary wrist hyperextension. Ultimately, these findings highlight the need for greater clinical awareness, preventative protocols, and timely therapeutic management for athletes engaging in high-intensity, wrist-loading disciplines.

Recommendations: To build on these findings, future research should integrate objective diagnostic modalities—such as nerve conduction studies, MRI, or high-resolution ultrasound—to confirm nerve entrapment with greater precision. Additionally, expanding the scope of functional testing to include specific grip variations, such as the tripod and tip pinch grips, would offer a far more detailed and nuanced understanding of how ulnar neuropathy impacts fine motor performance in athletes**.**

Limitations: Several limitations should be noted when interpreting these results. First, the cross-sectional nature of the design and the specific sample size constrain our ability to establish definitive causal relationships or generalize these findings to all lifting populations. Second, because we did not include tripod or tip pinch measurements, our assessment of hand mechanics remains somewhat incomplete. Finally, relying on self-reported data for symptom severity and training history introduces the possibility of recall bias, which may shift how certain participants reported their experiences.

Conclusion:

This study underscores a notable presence of Guyon's Canal Syndrome among weightlifters, with male athletes bearing the highest burden. The findings point to a clear need for heightened awareness, proactive injury prevention, and tailored management protocols within the strength training community. Additionally, the PRUNE scale demonstrated strong utility as a practical clinical tool, effectively capturing pain, neurological deficits, and functional setbacks. Utilizing this scale can substantially improve diagnostic accuracy and help clinicians design more precise, targeted rehabilitation programs.

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Ethical Permission:

This study was approved by the Institutional Review Board (IRB) of United College of Physical Therapy .Prior to participation, all individuals (and guardians, where applicable) were fully informed about the aims, procedures, potential risks, and benefits of the research. Written informed consent was obtained from all participants, ensuring their voluntary involvement. Participants were assured of their right to withdraw at any point without any consequences. Data confidentiality and anonymity were strictly maintained throughout the study. The collected information was used solely for research purposes and stored securely to protect participant privacy.

Conflict of Interest:

No conflict of interest

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REFERENCES

Alpar, O., 2021. Monitoring and fuzzy warning system for risk prevention of Guyon's canal syndrome. Biomedical Signal Processing and Control, 64, p.102228.

Brown, C.K., Stainsby, B. and Sovak, G., 2014. Guyon Canal Syndrome: lack of management in a case of unresolved handlebar palsy. The Journal of the Canadian Chiropractic Association, 58(4), p.413.

Chen, S.H. and Tsai, T.M., 2014. Ulnar tunnel syndrome. The Journal of Hand Surgery, 39(3), pp.571-579.

Chiaramonte, R., Pavone, P., Musumeci, G., Di Rosa, M. and Vecchio, M., 2022. Preventive strategies, exercises and rehabilitation of hand neuropathy in cyclists: A systematic review. Journal of Hand Therapy, 35(2), pp.164-173.

Chan, J.C., Tiong, W.H., Hennessy, M.J. and Kelly, J.L., 2008. A Guyon's canal ganglion presenting as occupational overuse syndrome: a case report. Journal of brachial plexus and peripheral nerve injury, 3(01), pp.e92-e94.

Eroğlu, A., Ürkmez, Ş., Atar, M., Pusat, S., and Atabey, C., Are Computers Friends or Foes? Pediatric Guyon Canal Syndrome Due to Prolonged Mouse Use: A Case Report.

Elwakil, W., Sultan, H.E., Hassan, M., Elshafei, M. and Hammad, E., 2024. Ulnar nerve involvement at the wrist in idiopathic mild to moderate carpal tunnel syndrome: electrophysiological and ultrasonographic study. Egyptian Rheumatology and Rehabilitation, 51(1), p.3.

Fok, M.W.M. and Bain, G., 2020. Ulnar Nerve Pathology and Treatment Rationale. Surgical techniques for trauma and sports-related injuries of the elbow, pp.727-729

Hoogvliet, P., Coert, J.H., Fridén, J. and Huisstede, B.M.A., 2013. How to treat Guyon's canal syndrome? Results from the European HANDGUIDE study: a multidisciplinary treatment guideline. British Journal of Sports Medicine, 47(17), pp.1063-1070.

Karpov, V.Y., Medvedev, I.N., Kazakov, D.A., Sibgatulina, F.R., Shulgin, A.M. and Krasnov, R.B., 2020. Physiological basis of rehabilitation for ulnar neuritis. Biomedical and Pharmacology Journal, 13(2), pp.585-590.

Kwak, K.W., Kim, M.S., Chang, C.H. and Kim, S.H., 2011. Ulnar nerve compression in Guyon's canal by ganglion cyst. Journal of Korean Neurosurgical Society, 49(2), p.139.

Kollmer, J., Bäumer, P., Milford, D., Dombert, T., Staub, F., Bendszus, M. and Pham, M., 2012. T2-signal of ulnar nerve branches at the wrist in Guyon's canal syndrome.

Kakita, M., Mikami, Y., Ibusuki, T., Shimoe, T., Kamijo, Y.I., Hoekstra, S.P. and ajima, F., 2020. The prevalence of ulnar neuropathy at the elbow and ulnar nerve dislocation in recreational wheelchair marathon athletes. Plos one, 15(12), p.e0243324.

Li, J., Gustafson, M., Hammerling, R., Williams, R. and Duey, W., 2013. Sonographic Evaluation of the Normal Ulnar Nerve in Guyon's Tunnel: Data on Cross-Sectional Area and Anthropometric Measurements.

Lee, J.H., Lee, J.K., Park, J.S., Kim, D.H., Baek, J.H., Yoon, B.N., Kim, S., Ha, C., Cho, W.M. and Han, S.H., 2022. Characteristics of surgically treated Guyon canal syndrome: A multicenter retrospective study. Journal of Plastic, Reconstructive & Aesthetic Surgery, 75(9), pp.3269-3278.

Li, C.W., Wu, J.C.H., Lan, C.Y., Lee, C.H., Huang, R.W., Lin, C.H., Hsu, C.C., Lin, Y.T., Chen, S.H., Tang, Y.B. and Chen, H.C., 2023. Prospective outcome analysis of ulnar tunnel syndrome: Comparing traumatic versus non-traumatic etiologies. Asian Journal of Surgery, 46(1), pp.180-186.

Ozdemir, O., Calisaneller, T., Gulsen, S. and Caner, H., 2011. Ulnar nerve entrapment in Guyon's canal due to recurrent carpal tunnel syndrome: case report. Turkish neurosurgery, 21(3).

Poenaru, D., Ojoga, F., Sandulescu, M. and Cinteza, D., 2022. Conservative therapy in ulnar neuropathy at the elbow. Experimental and Therapeutic Medicine, 24(2), pp.1.

Mulholland, J.M., 2018. The effect of wrist angle on ulnar nerve appearance at Guyon's canal in asymptomatic individuals utilizing high-resolution sonography. Sonography, 5(4), pp.164-173.

Noszczyk, B.H., Walecki, J., Osiak, K., Kiciński, M. and Pietruski, P., 2018. Shear-wave elastography in the diagnosis of ulnar tunnel syndrome. Journal of Plastic, Reconstructive & Aesthetic Surgery, 71(11), pp.1593-1599.

Ruas, E.S., Castilho, R.S., Maia, P.E.C. and Melo, G.L.R., 2010. Guyon's canal syndrome due to a synovial cyst. Revista Brasileira de Ortopedia (English Edition), 45(6), pp.623-626.

Reckelhoff, K.E., Li, J., Kaeser, M.A., Haun, D.W. and Kettner, N.W., 2015. Ultrasound evaluation of the normal ulnar nerve in Guyon's tunnel: cross-sectional area and anthropometric measurements. Journal of Medical Ultrasound, 23(4), pp.171-176

Rackard, F., Lujan-Hernandez, J., Vanguri, V. and Rothkopf, D., 2022. Pseudogout: A Rare Cause of Acute Carpal Tunnel Syndrome and Acute Guyon Canal Syndrome. Journal of Hand Surgery Global Online, 4(6), pp.375-378.

Rauch, A., Teixeira, P.A.G., Gillet, R., Perez, M., Clerc-Urmes, I., Lombard, C. and Blum, A., 2016. Analysis of the position of the branches of the ulnar nerve in Guyon’s canal using high-resolution MRI in positions adopted by cyclists. Surgical and Radiologic Anatomy, 38, pp.793-799.

Simon, O., Tranier, M., Bigorre, N., Marteau, É. and Bacle, G., 2024. Recurrence of ulnar tunnel syndrome: Long-term clinical and functional results of surgical management using revision neurolysis and subcutaneous anterior transposition. Hand Surgery and Rehabilitation, 43(1), p. 101614.

Scarborough, A., MacFarlane, R.J., Mehta, N. and Smith, G.D., 2020. Ulnar tunnel syndrome: Patho anatomy, clinical features, and management. British Journal of Hospital Medicine, 81(9), pp.1-9.

Sirisena, D.C., Sim, S.H., Lim, I. and Rajaratnam, V., 2021. Median and ulnar nerve injuries in cyclists: a narrative review. Biomedicine, 11(4), p.1.

Shen, L., Masih, S., Patel, D.B. and Matcuk Jr, G.R., 2016. MR anatomy and pathology of the ulnar nerve involving the cubital tunnel and Guyon's canal. Clinical Imaging, 40(2), pp.263-274

Shinde, S., Vaidya, A. and Bhore, P.R., 2022. Correlation between the Guyon Canal Syndrome and the Forward Head Posture in Prolonged Smartphone Users. International Journal of Occupational Safety and Health, 12(4), pp.276-283.

Uygur, M., Şengül, G. and Ertürk, M., 2015. A morphometric study of the ulnar nerve in Guyon's canal. Anatomy, 8(1), pp.7-12.