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A Review of Eagle's Syndrome

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ABSTRACT

Eagle's syndrome results from a calcified corresponding impact ligament or an elongated styloid process (ES). Neck or throat pain with ipsilateral ear radiation are other symptoms. Symptoms may be mistaken for facial neuralgias. Radiological and physical examinations may diagnose ES. ES is treated surgically. Intraoral or external procedures shorten the styloid process. The primary goal of this research was to investigate all aspects of Eagle's syndrome that might be significant to its care and prognosis. In this study, we have used secondary research approach. In this paper, we analyzed several papers and articles to comprehensively review the Eagle's syndrome. Our study demonstrates that an expanded styloid process isn't usually a sign of Eagle's syndrome. Depending on the etiology, a prominent lateral misconfiguration can induce anything from a little cervicofacial irritation to deadly ischemic damage. The symptoms were caused by the styloid process's length and anterior angulation, not its medial angulation.

Keywords: Eagle's syndrome, elongated styloid, pain, sensation, treatment.

INTRODUCTION

Head, neck, and facial pain are the hallmarks of Eagle's syndrome. The pointed styloid process bone, found just behind the ear, is often to blame. Eagle's syndrome pain is neuropathy, which means it is caused by aberrant nerve impulses rather than by damage to the tissues themselves. Some people describe the dull, throbbing pain as feeling like something is stuck in their throat. It has also been noted that some patients have tinnitus and neck pain.

According to the National Center for Biotechnology Information, only about 4% of people have an extremely long styloid process. However, only 4-10% of those show symptoms. This translates to around 1 in 62,000 persons. If GARD's data is to be believed, the prevalence of Eagle's syndrome among women is nearly three times that of men. A dysfunctional styloid process is linked to several symptoms and indications. Eagle's first used the word "stylalgia" in 1937 to describe the pain that might result from a prolonged styloid process. Traditional medical literature categorizes stylohyoid pain disorders as either acquired or congenital depending on the underlying medical condition. The term "Eagle's syndrome proper" refers to a painful condition caused by an enlarged styloid. The ossified stylohyoid ligament characterizes the congenital variety, also known as a stylohyoid syndrome, which has been linked to pain and other carotid compression symptoms (presyncope, syncope, and even transitory ischemic episodes). In light of new information, Eagle's syndrome is now understood to include much more than just pain. A growing body of research suggests that it is becoming more difficult to separate developmental problems from acquired ones.

The otolaryngologist's ability to recognize Eagle's syndrome in the clinic is essential. This is because Eagle's syndrome may

manifest in many forms, has profound consequences, and is treatable in most cases. We assess existing and future therapy options for Eagle's/stylohyoid syndrome based on a review of the literature. [3]

Headache and neck discomfort is a symptom of Eagle's syndrome. It has been hypothesized that one of the styloid processes or the least common ligament might be the sore spot. A sharp bone called the styloid process may be observed behind each ear. [14]

Symptoms of Eagle's syndrome

In cases with Eagle's syndrome, patients have discomfort on one side of their skull, face, or jaw. The discomfort might be intermittent or persistent. The impression is usually amplified when you yawn, move, or turn your head. Your ear may start hurting, too. Many people have a slightly different-shaped styloid process, although this is usually symptomless. Signs and symptoms often include:

- Problems swallowing
- Globus- the feeling of having something stuck in the throat
- Aching in the jaw or ear that shoots up from the throat
- Pain behind the tongue
- Discomfort on one side of the head while swallowing or tilting the head
- Continuous ringing sensation in the ears
- Headaches
- Pain radiating from the jaw
- Additional symptoms, such as unusual sensations in the head or neck, may also be present.

Causes

Most cases of Eagle's syndrome are due to an abnormally long styloid process bone. After sustaining a throat injury or undergoing surgery, some people develop an elongated styloid process. This is just a natural variation or a consequence of aging in some people. An extended styloid process may be painful if it pushes on the neck and pressurizes the nerves or blood vessels there.

Other causes of Eagle's syndrome include:

Tonsillectomy: Some people develop scar tissue in the throat after having their tonsils removed. Ear aches and tinnitus are possible side effects of increased pressure on the nerves in the region.

Calcification of the stylohyoid ligament: Calcium deposits may form on the styloid process in certain people, which is the attachment point for the stylohyoid ligament. It is unusual, but possible, to experience pain another discomfort.

The etiology of Eagle's syndrome is an abnormally long structure, most often the styloid processes or the corresponding impact ligament. No definitive explanation has been offered by the medical community for either of these cases.

Treatment

Eagle's syndrome is best treated by surgical excision of a piece of the lateral epicondyle. A styloidectomy is a surgical surgery in which the styloid membrane is removed, often through the mouth or the neck. Because the styloid process may be inaccessible without first removing the tonsils, tonsillectomy is often required before oral surgery. There is also a larger chance of injury to the arteries and veins in the area. The external approach leaves a scar on the patient's neck. Some surgeons now provide endoscopic procedures, in which the styloid process is accessed by a tube equipped with a camera. In 2017, researchers at Trusted Source examined the efficacy of this procedure and discovered that 107 out of 133 participants had a total resolution of symptoms and an additional 20 saw considerable improvement. One hundred and twenty-two respondents expressed satisfaction. These findings suggest that this surgical technique has the potential as a method of symptom relief.

The styloid process may be shortened surgically to treat Eagle's syndrome. Your tonsils may need to be removed so that the surgeon may access the styloid process. The

external approach is another potential access point, although it usually leaves a visible scar.

So, endoscopic surgery is being utilized to treat Eagle's syndrome. Endoscopes are long, thin tubes that physicians may insert into a patient's mouth to see their internal organs. A variety of specialized equipment is available for use with an endoscope, allowing for the performance of surgery. Since endoscopic surgery is less invasive than traditional surgery, patients may anticipate a more rapid recovery and fewer problems.

Eagle's syndrome patients whose underlying medical concerns make surgery too risky may benefit from the use of a variety of drugs, including antidepressants and antipsychotics, to manage their symptoms.

- Anticonvulsants
- Steroids
- Over-the-counter or prescription non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil, Motrin) or naproxen (Aleve, Naprosyn)
- Antidepressants, especially tricyclic antidepressants
- Local anesthetics [8]

Management of Eagle's syndrome

No surgical procedure is without its risks, and styloidectomy is no exception. Non-invasive methods of symptom management may be chosen if surgical treatment fails to alleviate symptoms.

The use of such techniques may help reduce discomfort-

Anti-inflammatory medicines and other pain relievers (NSAIDs)

Injecting steroids

Pain is not due to tissue damage but rather to irritation of a nerve. Because of this, massage, exercise, and similar localized pain treatment methods will probably not help.

Diagnosis

Because the symptoms of Eagle's syndrome are common to so many different diseases, it can be challenging to pinpoint the exact cause. The first thing the doctor will do is examine your head and neck for symptoms of a lengthy styloid process. For a more in-depth look at your styloid process and stylohyoid ligament, your doctor may also order a CT scan or X-ray. An ENT doctor will examine your ears, nose, and throat to rule out any underlying health issues. When a patient exhibits symptoms typical of Eagle's syndrome, a physician may make a diagnosis. However, physicians must rule out other potential reasons for discomfort in this location, including:

- An ache in the neck and teeth
- Herniated discs
- Difficulty with the blood vessels in the area
- Inflammation of the ear canal
- A broken jaw or a physical injury

Symptoms may be discussed, a complete medical history taken, and a physical examination conducted during a medical assessment. Imaging tests, such as X-rays, may be used to have a look at the styloid process and its surrounding area. In certain cases, the doctor may feel an excessively lengthy styloid process pushing on the back of the neck.

Complications with Eagle's syndrome

The intrinsic subclavian artery on each side of your neck may become compressed if your styloid membrane is too lengthy. A stroke might be the result of this stress. If you suddenly suffer any of the following symptoms, seek emergency medical attention immediately:

- Headache
- Weakness
- Loss of balance
- Changes in vision
- Confusion [14]

Outlook

There is no one specific therapy that can cure Eagle's syndrome, although over 80% of patients who seek treatment do so.

Patients who choose surgical intervention may have an even better prognosis. One reliable research found that 95% of patients with Eagle's syndrome who had endoscopic surgery reported improvement in their symptoms. Eagle's syndrome may become a chronic issue for those who either do not want surgery or for whom it does not improve after surgery. Symptoms may get better with medical treatment, but they probably won't go away entirely.

Eagle's syndrome does not worsen over time or lead to other health problems. There are, however, many who experience a worsening of their pain over time or a spread to other parts of the body. Depression, anxiety, and difficulties maintaining relationships are additional side effects of living with chronic pain. Those who do not get complete alleviation from their pain may benefit from attending a support group, engaging in counseling receiving some other sort of emotional reinforcement. [12]

Eagle's syndrome is uncommon and poorly understood, although it may be readily cured with a few pills or a few operations. The vast majority of patients who get treatment will ultimately recover completely. [6]

Objective

The main aim of this study is to examine Eagle's syndrome including its symptoms, causes, therapy, management, diagnosis, and the literature.

METHODOLOGY

In this study, we have used secondary research approach. For comprehensive review we used secondary sources like books, previously published papers, and highly impacted journals (PubMed, Int J Pediatr Otorhinolaryngol, J Gen Intern Med, Arch Otolaryngol - Head Neck Surg, Ann Ibadan Postgrad Med, etc). In this study, several, journals, articles, research papers, newspapers, media reports, and websites were analyzed to fulfill the objective of this study. In this paper, we analyzed several papers and articles to comprehensively review Eagle's syndrome.

Review of Articles

Sudden Death Due to Eagle's Syndrome

Stylohyoid membranes bone formation or extended styloid processes are also potential causes of the manifestations of Eagle's condition. Several explanations have been presented as to what causes Eagle's syndrome, however, it remains, unknown whether one is correct. The expanded styloid process causes a broad range of symptoms, from cervicofacial discomfort to ischemic injury, depending on its involvement in the pathophysiology route and the structural abnormalities it compresses or irritates. Patients seeking therapy for these conditions may visit many facilities before finding the right fit. The victim in this instance had a history of blackouts and regular headaches for which she sought treatment at several facilities. Postmortem examination revealed an extended styloid process; Due to this discovery and the evidence of rapid circulatory failure, the probable cause of death was determined to be sudden death from mechanical irritation of the carotid sinus. [11]

Eagle's Syndrome: A Diagnostic Challenge with a Novel Solution

Pathognomonic symptoms and indicators of ES are nonspecific and might have several causes, making a diagnosis difficult. The patient suffered tremendous emotional and mental anguish due to the three-year lag between the start of symptoms and the implementation of final treatment. Identifying, diagnosing, and treating ES needed a collaborative effort spanning chronic pain medicine, otolaryngology, and psychiatry. To our knowledge, this is the first time a straightforward, fluoroscopically guided injection procedure has been used to confirm the diagnosis of such a rare illness. [5]

"Long-Term Surgical Treatment of Eagle's syndrome"

The pain associated with Eagle's disorder originates in the elongated styli or calcified stylohyoid and can radiate to the nasal passages, face, and neck. It's treated with styloidectomy research, they compare two surgical treatments for Eagle's syndrome. They reviewed the 1997-2008 charts retrospectively. Seven cases with Eagle's syndrome were reviewed. Six individuals received surgery and one chose to wait. The Boston Medical Center Institutional Review Board accepted the study's retrospective design without requiring further permission. Results: Three males and four women were identified as patients. Median and mean diagnostic ages were 44 and 26.2 years. Symptoms included neck soreness and odynophagia. Three patients had trans oral and trans cervical styloidectomy. Symptoms typically resolved after 26.5 days. All patients who had styloidectomy experienced full remission of symptoms, according to the study. Both surgical procedures provide the intended result, but the patient's requests and the surgeon's skill determine which to use. [9]

Styloid length and Eagle's syndrome anatomy

A bony protrusion called the styloid process may be seen just in front of the stylomastoid foramen. Eagle's syndrome is a kind of postoperative pain that manifests itself in the cervical and face regions. The researchers hope to utilize cadavers, binocular radiographs, and dry skulls to determine how often an extended styloid process is concerning Eagle's syndrome and what the typical length of the lateral epicondyle is. Styloid processes in men were significantly longer than those in females statistically speaking. Descriptive data and comparisons across age groups were compiled. Neither the right nor the left superior articular process lengthened with age. The average duration of the right and left styloid extensions was 22.54 mm (+/- 4.24 mm) in both the human corpses and the dry bones. Styloid processes are excessively lengthy in 3.3% of women. Elongated styloid processes were found to have an average length of 36.06 +/- 6.12 mm, while the length of a styloid process in a person with Eagle's syndrome was 40 +/- 4.72 mm. If successful, the morphological study might be used to help diagnose Eagle's syndrome. [4]

"Eagle's Syndrome: An Unusual Cause and Surgical Treatment"

The symptoms of "stylalgia," also known as Eagle's syndrome, include difficulty swallowing, facial pain, persistent soreness in the throat, and the sensation that there is something stuck in the throat. Elongated styloid or calcified stylohyoid ligament causes these symptoms. This illness is sometimes misdiagnosed since its symptoms resemble those of other facial neuralgias. Depending on the community, Eagle's syndrome may or may not be common. It affects adults, often shows no symptoms, and may be detected with a combination of thorough physical imaging tests. A 30-year-old man visited the maxillofacial unit at Sulaimaniyah Teaching Hospital because of right-side facial discomfort that had been persistent for six months and was preventing him from opening his mouth normally. An intra-oral surgical resection of the right side's lengthy styloid process. During the five months of observation, the patient had no adverse effects.[1]

"Sagittal deviation of the styloid process in Eagle's syndrome"

In this study, the angulation and the length of the styloid process between patients operated for Eagle's syndrome and a control group were investigated and compared using the lateral skull and Towne's radiographs. 31 individuals had enlarged styloid processes corrected. Chronic otitis media and trauma controls had no enlarged styloid process. With the use of lateral skulls and Towne's ultrasonography, we investigated the proper alignment and length of the styloid elements

of individuals with Eagle's syndrome to a control condition. The healthy control group's right and left styloid processes were 2.8 and 2.6 cm. Patients' right and left anterior angulations were 33.6 and 36.7 degrees, whereas controls' were 21.4 and 18.5 degrees. Length The angle between the front of the body and the spherical coordinate system varies (P = 0.001). The median right medial angulation of the healthy population was 15 degrees, whereas the median left medial angulation was 18.1 degrees. The two teams weren't distinguishable from each other in the least. Eagle's syndrome symptoms are caused by anterior angulation and styloid process length. [15]

Eagle's syndrome presented with neurological symptoms

Discomfort in the throat or neck, difficulty swallowing, or pain in the face may all be symptoms of Eagle's syndrome, which is caused by a calcified stylohyoid ligament or an extended styloid process. Compression of the lower cranial nerves has also been documented clinically. Compression or dissection of the carotid artery, often known as carotid artery syndrome, has been documented in certain patients with an extended styloid process. When the carotid artery is compressed, blood flow is decreased, resulting in carotidynia or other neurological symptoms. The jugular vein and the dural sinuses are vulnerable to pressure. Rarely are neurological signs of Eagle's syndrome recorded. A retrospective analysis was performed on five patients (ages 22 to 68) admitted to the hospital for various neurological complaints. CT scans of all of the patients showed an elongated styloid process. Neurologic problems may be brought on by a prolonged styloid process. Neurological symptoms may be present in Eagle's syndrome. If neurological symptoms presented without any apparent external cause, this would be included in the differential diagnosis. We found no previous literature that described the neurologic symptoms of patients with an elongated styloid process with arterial and venous compression. [2]

"One-Sided Protrusion of the Styloid Process (Eagle's syndrome)"

Dysphagia, face discomfort, globus feeling, and headache are all symptoms of Eagle's syndrome, which is caused by a prolonged or calcified stylohyoid ligament. It might be a one-way street or a two-way street. It affects 4 percent of adults, although only 0.16 percent of individuals who have it have any symptoms. To distinguish this condition from other orofacial aches and neuralgia, a thorough history, clinical examination, and imaging studies are required for diagnosis. A 22-year-old female patient had facial pain and was eventually diagnosed with a unilaterally expanded styloid process, which is described in this report. [7]

A male patient diagnosed with Eagle's syndrome at age 39

The ossifying stylohyoid ligament may be noticed inadvertently in panoramic photographs. Sometimes there are no outward signs of this condition. However, Eagle's syndrome is present when pharyngeal discomfort, a foreign body feeling, tinnitus, or otalgia occur. Migraines, aphasia, vertigo, and syncope may all be brought on by pressure on the carotid artery, and are often noted when the affected person turns their head to the affected side. A 39-year-old man with a history of head and neck pain, especially in cold weather, with thick ossified stylohyoid ligaments on both sides and five pseudo articles was the subject of this study. [10]

"Case study of Eagle's syndrome"

Eagle's condition can be caused by a cemented corresponding impact ligament or an extended styloid process. In his 1937 evidence-based study, Eagle's suggested that an extended styloid process might be the cause of maxillary and spinal discomfort, although this is only one of several probable causes. It is believed that 0.16 percent of the adult population has this

anatomical abnormality, although only individuals with the anomaly experience symptoms. Eagle's syndrome often manifests itself with neck, throat, or ear pain; trouble swallowing; anguish while rotating the head, and headaches. The patient's clinical history, medical assessment, and imaging studies can all help in the diagnosis of Eagle's syndrome. In more serious situations, the styloid process must be surgically removed; this procedure can be done intraorally or extra orally. The extraoral surgery was successful in alleviating the patient's symptoms. [13]

Eagle's syndrome: Non-Surgical Treatment

Eagle's syndrome is an illness without a distinct lesion with repeating bouts of similar symptoms. Patients experiencing pharyngalgia, odynophagia, a feeling of a foreign body in the throat, tinnitus, and otalgia should have this checked out. It is characterized by the extension of the styloid process or the compression of neighboring anatomical structures due to the calcification of the stylohyoid ligament. A stroke may be caused by persistent pressure on the carotid artery. Clinical symptoms, radiological results, and physical exams all contribute to a final diagnosis. Conventional treatment is surgical excision of the elongated styloid process. However, the instance presented here shows that conservative treatment may be effective for Eagle's syndrome. [15]

CONCLUSION

Talking, eating, and even turning their head may be very uncomfortable for someone with Eagle's syndrome. Someone with this disease may dread the worst and put off getting medical help. Eagle's syndrome, fortunately, is readily curable, with great results for most patients who do so. People who are experiencing Eagle's syndrome symptoms should see a pain specialist, either independently or on the recommendation of a general practitioner. Depending on the neurobiological route and the structural components that are compressed by the bigger lateral epicondyle, the symptoms may originate from anything such as a simple irritation or cellular destruction. Sudden death through biomechanical irritation of a cavernous sinus due to an elongated transverse process may be supported by evidence of instantaneous circulatory collapse, as well as confirmations from medical specialists plus eyewitness statements of the course of the illness. Just like that if a patient presents with nonspecific cervical discomfort or odynophagia, it is important to explore the possibility of Eagle's syndrome, a condition that is uncommon but worth investigating. Radiographic panoramas and 3D-CT reconstructions aid much in diagnosis and preoperative planning. Even if a single protruding styloid process is not always indicative of Eagle's syndrome. Both the patient's preferences and the surgeon's expertise should be considered when deciding on a surgical method. After surgery, most of these individuals no longer have any of their original symptoms. Diagnosis of styloid process elongation may also benefit from a comprehensive history, physical examination, and radiological investigations. There are a lot of potential confounding factors that need to be ruled out. When ruling out possible causes of discomfort and restricted mouth opening, Eagle's syndrome should always be considered. Our study also concludes that diagnosis of the styloid process elongation syndrome requires a comprehensive history, physical examination, and imaging studies. Surgical removal of excessively lengthy styloid processes is the recommended course of therapy. However, not all radiographically extended styloid processes are symptomatic, and vice versa. The manifestations of Eagle's syndrome tend to concentrate inside a very lengthy styloid process. It was shown that the symptoms stemmed less from a medial inclination angle of the lateral epicondyle than from its length and anterior inclination angle. Due to its rarity, unilateral styloid process

elongation can be challenging to diagnose in children and adolescents, but two-dimensional X-rays are as effective as three-dimensional CT scans in the evaluation of Eagle's syndrome. Every expert who treats or manages face pain should be familiar with the varied clinical manifestations of Eagle's syndrome and should consider it as a possible cause of the pain.

Declaration by Authors

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