Case report involving temporomandibular dysfunction, eagle’s syndrome and torus mandibularis —Multidisciplinary approaches

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ABSTRACT

The prevalence of torus mandibularis, Eagle’s syndrome and parafunctional activity was reported to be higher in patients with temporomandibular joint dysfunction and might be useful as an indicator of increased risk of temporomandibular disorders. This study case report was to evaluate a 62-year-old female patient, with limited mandibular and cervical movements, articular and muscular pain, ear fullness, irritation of the lingual mucosa, discomfort associated with movement of her tongue, involving temporomandibular dysfunction, torus mandibularis and Eagle’s syndrome. The treatment comprehended the collection of data of Helkimo’s Clinical Dysfunction Index, electromyographic activity of the masseter and temporalis muscles in rest position and bite force, masticatory efficiency, speech evaluation and occlusal splint, after the excision of the stylohyoid process and mandibularis torus. The authors found a decrease in electromyographic activity of masticatory muscles, a reduction of painful symptoms throughout the region muscular and joint pains, an increase in the amplitude of mandibular movements, an improvement in masticatory efficiency and an increase in bite force.

Keywords: Temporomandibular Dysfunction; Eagle’s Syndrome; Torus Mandibularis; Electromyography; Bite Force

1. INTRODUCTION

Torus mandibularis (TM) is an exophytic bone growth that usually occurs bilaterally along the lingual surface of the premolar area of the mandible, superior to the mylohyoid ridge [1,2]. In patients who are completely or partially edentulous, the occurrence of TM can interfere with the prosthetic treatment plan in dentate patients. TM can interfere with masticatory and speech functions. Therefore, even when asymptomatic, the surgical removal of the tori is indicated in these cases [3,4].

The etiology of TM has been investigated by several authors; however, no consensus has been reached. It is generally accepted that genetic factors contribute to the occurrence of TM [5-8].

The prevalence of both TM and parafunctional activity has been reported to be higher in patients with temporomandibular joint dysfunction [9], and therefore, these factors may be useful indicators of an increased risk of temporomandibular disorders in some patients.

Eagle’s syndrome affects the head and neck structures and produces headache, earache, changes in swallowing and speech, and facial, cervical and eye pain [10-14].

Symptoms may also occur along the distribution of the external and internal carotid artery branches due to com-
pression at points on the vessels, affecting vascular circulation and irritating the sympathetic nerves of the arterial sheath [15].

It is often difficult to establish a definitive diagnosis of Eagle’s syndrome due to the similarity of these symptoms to the other pathologies that affect the head and neck areas. Therefore, the use of an occlusal splint, normally applied in the treatment of TMD, can be helpful during the process of differential diagnosis [16].

Eagle’s syndrome affects approximately 27% of the population, and elderly females show a greater prevalence of an elongated stylohyoid ligament complex [18,19]. Additionally, the presence of an elongated stylohyoid ligament complex was found in approximately 19.6% of Brazilian human skulls [17]. This syndrome is more prevalent in the elderly because the aging process promotes the development of a tendinosis at the junction of the stylohyoid ligament and the lesser horn of the hyoid bone [20].

The underlying mechanisms for this life-long process may involve variability in the length and shape of the second branchial arch cartilage, which may explain cases of styloid complex ossification in adults and the elderly. It is also possible that the ossification of the branchial cartilages is a part of the normal aging process, as it also occurs in other derivatives of the branchial arches, such as the laryngeal cartilages [21].

The aims of this present study were to demonstrate different approaches for the resolution of a clinical case involving temporomandibular dysfunction, torus mandibularis and Eagle’s syndrome in an elderly woman.

2. CASE REPORT

A 62-year-old woman was referred to the Occlusion, Temporomandibular Dysfunction and Orofacial Pain in Patients with Special Care Course, School of Dentistry of Ribeirão Preto, University of São Paulo, complaining of limited mandibular and cervical movements, articular and muscular pain, ear fullness, irritation of the lingual mucosa, and discomfort associated with movement of her tongue. Earlier, she received a medical diagnosis of Eagle’s syndrome, and surgical removal of the styloid process was suggested.

The patient was informed about the treatment plan and study procedures by the investigators and signed the informed consent. The study was approved by the Ethics Committee of the School of Dentistry of Ribeirão Preto, University of São Paulo (process n 2006.1.971.58.5).

A physical examination of the oral cavity revealed general dental wear and extensive bony overgrowths along the lingual surface in the premolar area of the mandible (Figure 1). At the time of examination, the mucosa that was overlying the tori appeared normal; however, during later preoperative appointments, small areas of abrasive lesions were often observed. Furthermore, the tongue rest position and the functional activities of the masticatory system were abnormal, promoting muscular pain. The patient revealed that this pain often occurred after the mastication of hard food; she also reported occasional bruxism.

The first stage of the treatment plan involved the collection of relevant data with the following analyses: Helkimo index [22], electromyographic activity of the masseter and temporalis muscles in rest position (Table 1), bite force (Table 2) [23], masticatory efficiency [24] and speech evaluation [25].

The orofacial muscles (masseter, temporalis, pterygoid) and the condyle lateral pole were bilaterally palpated in order evaluate pain upon palpation using a numeric scale.

![Figure 1. Extensive bony overgrowths in the premolar area of the mandible.](image-url)

**Table 1.** Numeric values of the electromyographic activities of the masseter and temporalis muscles, before (E1) and after (E2) treatments.

<table>
<thead>
<tr>
<th>Phases</th>
<th>Right Masseter (µV)</th>
<th>Left Masseter (µV)</th>
<th>Right Temporalis (µV)</th>
<th>Left Temporalis (µV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>10.5</td>
<td>4.8</td>
<td>4.3</td>
<td>4.6</td>
</tr>
<tr>
<td>E2</td>
<td>6.1</td>
<td>2.7</td>
<td>4.3</td>
<td>4.1</td>
</tr>
</tbody>
</table>

**Table 2.** Means of the maximal bite force in the left and right molar regions, before (E1) and after (E2) treatments.

<table>
<thead>
<tr>
<th>Site</th>
<th>Evaluation</th>
<th>Bite Force (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Molar</td>
<td>E1</td>
<td>34.3</td>
</tr>
<tr>
<td></td>
<td>E2</td>
<td>46</td>
</tr>
<tr>
<td>Left Molar</td>
<td>E1</td>
<td>67.6</td>
</tr>
<tr>
<td></td>
<td>E2</td>
<td>88.2</td>
</tr>
</tbody>
</table>
This scale consisted of 11 points, beginning with “0” (no pain) and ending in “10” (the worst imaginable pain) [26] (Table 3).

Using the Hugoson Index [27], the observed occlusal wear was classified as level 1 (attrition of enamel down to dentin spots), confirming the presence of bruxism that was reported earlier by the patient.

Maximum mouth opening and the right and left lateral movements were measured with a millimeter ruler. To measure the maximum mouth opening movement, the patient was requested to open her mouth, and the distance between the incisal borders was measured. The patient performed right and left lateral movements, and the distance between the mandibular and maxillary midlines was measured. As there was no coincidence, a pencil mark was made on the surface of the maxillary incisor, corresponding to the mandibular midline, and a measurement was later taken. The protrusion distance between the maxillary and mandibular incisal borders was measured with a ruler (Table 4).

The patient’s masticatory efficiency was determined using a coconut and sieve system, before and after treatment. The patient received four aliquots of coconut pieces, weighing a total of 20 g. Each piece of food was chewed for 50 cycles. After mastication, the chewed particles were expelled into a set of five sieves (5, 4, 3, 2 and 1 mm) and were washed with water. Then, the particles were separated according to the granulometric mesh sizes. The test tubes were centrifuged for 5 minutes, and the volumetric data were inserted in a mathematical formula \((4A + 2B + C/D + E)\) to obtain the index of mastication. The patient’s masticatory efficiency was determined on the evaluation of mandibular movements, muscular pain and articular signs and symptoms of dysfunction, such as limited jaw opening, pain during mandibular movements, and pain during articular and muscular palpation. She received an Acute Physiology and Chronic Health Evaluation III score (AIII) for amnestic dysfunction and, after treatment, for minor signs and symptoms of dysfunction, such as TMJ noises, fatigue of masticatory muscles and TMJ stiffness.

The data collected on the evaluation of mandibular movements, functional evaluation of the TMJ, pain during mandible movements, muscular pain and articular pain accurately demonstrated the degree of TMJ dysfunction, both before (DiIII—severe clinical symptoms

### Table 3. Intensity of muscular and articular pain, before (E1) and after (E2) treatments.

<table>
<thead>
<tr>
<th></th>
<th>Masseter</th>
<th>Temporalis</th>
<th>Lateral Pterygoid</th>
<th>Condyle Lateral Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>E2</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

### Table 4. Numeric values of the measurements of mandibular movements, before (E1) and after (E2) treatments.

<table>
<thead>
<tr>
<th>Mandibular Movements (mm)</th>
<th>Mouth Opening</th>
<th>Right Laterality</th>
<th>Left Laterality</th>
<th>Protrusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>29</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>E2</td>
<td>50</td>
<td>8</td>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

### Table 5. Numeric values of the volumetric data and masticatory index, before (E1) and after (E2) treatments.

<table>
<thead>
<tr>
<th></th>
<th>Sieve A</th>
<th>Sieve B</th>
<th>Sieve C</th>
<th>Sieve D</th>
<th>Sieve E</th>
<th>Results</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>10</td>
<td>4</td>
<td>1.85</td>
<td>bad</td>
</tr>
<tr>
<td>E2</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>5</td>
<td>1</td>
<td>5.66</td>
<td>good</td>
</tr>
</tbody>
</table>
of dysfunction) and after (DI—I—moderate clinical symptoms of dysfunction) treatments.

4. DISCUSSION

Orofacial pain, joint noise and limited mandibular movements are symptoms commonly associated with TMD. Other symptoms, such as headache, earache, neck pain, tinnitus and dysphagia are also related to this disorder [28-30]. Similar signs and symptoms may be found in other diseases, such as Eagle’s syndrome, and it may be difficult to establish the correct diagnosis and appropriate treatment [10,31].

To facilitate diagnosis, the patient should be submitted to a group of professionals from diverse disciplines, to provide a comprehensive assessment and consultation in cases that present several signs and symptoms, such as the case reported here.

The first stage of the treatment plan involved the collection of data that allowed a global view of the patient’s clinical and functional conditions. The sequence of procedures was then selected.

The surgical treatment for Eagle’s syndrome involves the excision of the stylohyoid process [10,12]. However, such treatment involves the possibility of associating pathologies that may aggravate the symptoms. Therefore, a conservative, nonsurgical approach with an occlusal splint is often.

Dentists should be aware of the risks of surgical intervention to provide a better diagnosis and therapeutic procedure [32].

Because the occurrence of bilateral TM can interfere with masticatory and speech functions in dentate patients, affecting their quality of life, the clinicians in this case chose to apply surgical intervention. The favorable clinical results (tongue rest position and functional activities) confirmed the appropriateness of this choice.

The ability to grind food is the end product of chewing, and several structures of the stomatognathic system work together so that chewing can be satisfactorily performed. To evaluate the masticatory function, which encompasses the efficiency of the masticatory muscles and masticatory performance, the maximum bite force is useful in both demonstrating how the system is fully interfaced and in revealing any anatomical changes and temporomandibular disorders that lead to an imbalance of this system [33].

After treatment, the patient’s masticatory efficiency improved. The activity began to be pleasant, without joint or muscular pain and without trauma to the area that previously accommodated the mandibular tori. The patient could also chew food harder and faster.

Occlusal splint therapy was applied to treat the patient’s TMD and to assist the group of professionals during the differential diagnosis process, as previously suggested [16]. The satisfactory clinical outcomes were evidenced in the increased amplitude of mandibular movements, decrease in muscular/articular pain and the improvement in functional activities.

The patient was instructed to chew pieces of test food as usual, and it was observed that chewing was performed on the left, with greater bite force on the left side. The right side exhibited greater muscle and joint pain, justifying the patient’s preference for chewing on the left side. It should be noted that the magnitude of the bite force varies when characteristics of the craniofacial complex are abnormal, especially in cases of temporomandibular dysfunction [34].

Electromyographical analysis of the masseter and temporalis muscles may be used to compare muscular activities during rest and during clinical manipulation [18]. The results of electromyographic analyses showed that mean muscle activity was improved after the combination of surgical therapy and the occlusal splint.

This article reports a clinical case in which a combination of surgical therapy and dental resources were used to treat limited mandibular movements and painful symptoms in a patient with temporomandibular dysfunction, Eagle’s syndrome and torus mandibularis.

In recent decades, the required care for older people has increased in the daily practice of dental professionals. Therefore, it is critical for clinicians to understand the situations that lead to discomfort in older patients.

5. CONCLUSION

In summary, dental practitioners should understand the causes of anatomical changes, improving their patients’ quality of life by providing a more practical approach to the treatment of painful sintomatologia in older people with Eagle’s syndrome, temporomandibular disorder and mandibular tori.

6. ACKNOWLEDGEMENTS

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REFERENCES


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