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## Ernest syndrome as a consequence of stylomandibular ligament injury: A report of 68 patients

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The disorder associated with pain of the styloid process is termed Eagle's syndrome.<sup>1-3</sup> It involves the mineralization of the stylohyoid ligament, elongation of the styloid process, or even the continued growth and subsequent ossification of the second brachial arch cartilage.<sup>4-6</sup> Clinically this condition, which frequently occurs bilaterally, is known to cause facial pain, pain on swallowing, turning the head, or opening the mouth, otalgia, temporal headache, and even vertigo.<sup>4</sup>

A similar, but different disorder that also involves the styloid process has also been described.<sup>7,8</sup> In contrast to Eagle's syndrome, this condition involves the stylomandibular ligament, particularly its mandibular insertion. It is referred to as the Ernest syndrome.<sup>9,10</sup>

Clinically, the patient has symptoms similar to Eagle's

syndrome and internal derangements of the temporomandibular joint (TMJ)<sup>10-13</sup>: pain in and around the TMJ, the ear, the temple, the body of the mandible, and pain in the eye. In addition, pain in the throat and even in the shoulder are common. In this study, 68 patients with the Ernest syndrome were investigated to determine (1) specific symptoms associated with injury to the stylomandibular ligament, (2) various epidemiologic data that would be useful in differential diagnosis, and (3) various modes of treatment.

### MATERIAL AND METHODS

Sixty-eight patients were diagnosed as suffering from Ernest's syndrome according to these criteria: (1) a history of reporting pain in the specific anatomic regions

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**PATIENT QUESTIONNAIRE**

NO: \_\_\_\_\_

Name: \_\_\_\_\_

Age: \_\_\_\_\_

Length of symptoms: \_\_\_\_\_

MIO: \_\_\_\_\_

LLM: \_\_\_\_\_

RLM: \_\_\_\_\_

PM: \_\_\_\_\_

Etiology: AA Blow Surg. Other: \_\_\_\_\_ Unknown

Symptoms: mand teeth ear TMJ temp eye throat other

Able to be Tx conservatively: yes no

Surgery needed for Tx: yes no

Other disorders:

Temporal tend \_\_\_\_\_

GON neuralgia \_\_\_\_\_

Inter. derang \_\_\_\_\_

Other: \_\_\_\_\_

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**Fig. 1.** Patient questionnaire completed for each patient in the study.

**Table I.** Sex distribution of participants in the study

	No.	%
Men	12	18
Women	56	82
Total	68	100

noted previously, (2) pain on palpation of the insertion of the stylomandibular ligament, and (3) relief of pain after a diagnostic anesthetic injection into the ligamentous insertion, as described by Ernest.<sup>7</sup> A specific questionnaire (Fig. 1) was completed for each patient in this study and the results were tabulated and analyzed.

## RESULTS

Eighty-two percent of the patients (56) were women (Table I); patient ages and duration of symptoms are tabulated in Table II.

Table III lists the ranges of motion of the mandible for

**Table II.** Ages and duration (years) of history of symptoms

Age	
Average	34.71
Minimum	13.00
Maximum	69.00
History of symptoms	
Average	4.37
Minimum	0.08
Maximum	26.00

wide opening, right and left lateral movements, and protrusive movements. Maximum incisive opening movements were made from maximum intercuspation or acquired centric occlusion,<sup>14</sup> and did not include vertical overlap of the maxillary anterior teeth. Lateral movements of the mandible were measured from the maxillary midline (determined by the central incisors). Protrusive movements were measured from the patients' acquired centric occlusion by using the maxillary central

**Table III.** Average ranges of motion of the mandible

Motion	Range (mm)
Maximum incisive opening	38.39
Right lateral	10.75
Left lateral	10.60
Protrusive	5.47

**Table IV.** Etiology of symptoms

Event	No.	%
Automobile accident	22	32.35
Blow to mandible	11	16.18
Unknown	28	41.18
Head trauma	1	1.47
Dental treatment	3	4.41
Back injury	1	1.47
Traction	1	1.47
Intubation	1	1.47

incisors as a reference. Table IV illustrates the data concerning the etiology as reported by the patient.

Table V records the regions of reported pain and Table VI shows additional craniomandibular disorders that a number of patients had in addition to Ernest's syndrome. Table VII depicts whether the left, right, or both stylomandibular ligaments were affected. Table VIII presents the data concerning treatment.

**DISCUSSION**

**General characteristics**

Others have observed that most symptomatic patients are women, an observation still unexplained.<sup>13, 15-17</sup> Differences of clinics versus private practice<sup>18</sup> and different ancestral background cannot be overemphasized. This difference may also be explained by men's attitude about the need to seek medical attention.<sup>19</sup> That the average age was 37.71 years seemed to confirm other studies as to the average age of those reporting craniomandibular pain.<sup>20-23</sup> Again, no specific reason has been given for the frequency of the conditions prevalent in the fourth decade.

**Range of motion and etiology of complaints**

All ranges of motion of the mandible were reduced from the normal<sup>11, 23, 24</sup> (Table III). These reductions may be explained because the functions of the stylomandibular ligament are (1) to limit the maximum opening of the mandible and (2) to limit the protrusion of the mandible.<sup>25, 26</sup> Anatomically, the stylomandibular ligament has been described as a broad band of fascia stretching from the styloid process to the posterior border of the ramus<sup>26, 27</sup> and attaching medially just above the angle of the mandible (Fig. 2).<sup>28</sup> Table IV lists the

**Table V.** Areas of reported pain

Area	No.	%
Ear	60	88.24
TMJ	58	85.29
Temporal	58	85.29
Mandibular	50	73.53
Tooth	50	73.53
Throat	40	58.82
Eye	38	55.88
Other	26	38.23

"Other" is described in text.

**Table VI.** Additional craniomandibular disorders

	No.	%
Temporal tendonitis	11	16.18
Greater occipital nerve neuralgia	7	10.29
Internal joint derangements	26	38.24
Myofascial pain dysfunction syndrome	27	39.71

**Table VII.** Ligaments affected

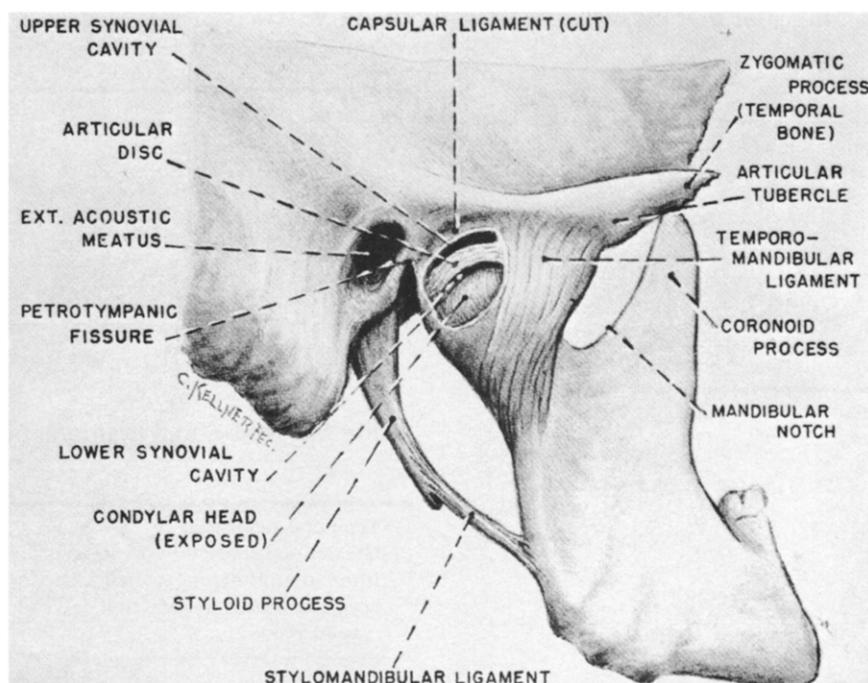
	No.	%
Bilateral	29	42.25
Right	22	32.35
Left	17	25.00

**Table VIII.** Treatment required

Treatment	No.	%
Nonsurgical	53	77.94
Surgical	15	22.06

etiology of stylomandibular pain under six major categories with three especially notable ones, (1) auto accident, (2) blow to the mandible, and (3) unknown origin. Those placed in the category of "auto accident" were diagnosed by a chiropractor or a physician as a flexion-extension type of injury or "whiplash." The forces generated in this type of injury have been described elsewhere as contributing to craniomandibular pain.<sup>10, 29, 30</sup> Those in the category of "blow to the mandible" had specific histories relating various types of trauma to the mandible. Of those listed in the category of "unknown," many had a history of numerous traumatic episodes to the mandible but could neither remember nor relate the onset of the symptoms to any one specific incident of trauma. In addition, several in the group could not actually relate any traumatic incident to the onset of their symptoms.

Five of the patients (7.35%) believed that their Ernest



**Fig. 2.** Attachment of stylomandibular ligament. Origin at styloid process and insertion on medial portion of mandible. (From Shapiro HH. Applied anatomy of the head and neck. Philadelphia: JB Lippincott Co., 1947, with permission.)

syndrome symptoms began with iatrogenic health care (dental treatment [3], cervical traction [1], and intubation [1]). The one patient in the category of "head trauma" had reported striking his head on the windshield during an automobile accident. The patient in the category of "back injury" was a coal miner who believed that his symptoms began when he injured his back while working.

### Region of pain

The regions of pain, as described by the patients, were consistent with those reported by Ernest.<sup>7</sup> Of the seven major regions of pain (Table V), ear pain (88.24%, or 60 of 68 patients) seemed to be the most common, with TMJ pain (85.29%) and temporal pain (88.29%) also prevalent. Mandibular pain (73.53%), which consisted of pain in the body of the mandible and/or coronoid process, and mandibular posterior tooth sensitivity (73.53%) were the third most common symptoms. Eye pain (55.88%) and throat pain (58.53%) were also frequently observed symptoms. Throat pain was usually restricted to the lateral pharyngeal wall and usually presented as a sore throat. The findings for these seven regions of pain all agreed with the findings of Ernest.<sup>7</sup>

The remaining painful regions, "other symptoms," were subdivided into the following categories: (1) shoulder pain (35.29%), (2) back pain (1.47%), and (3) hoarseness (1.47%). Although the number of patients

suffering with these additional symptoms (38.23%) was significant, the cause may have been referred pain from the stylomandibular ligament or possibly a trigger point involving the posterior digastric muscle.<sup>32</sup>

Table VI depicts the distribution of other craniofacial disorders in addition to Ernest's syndrome. Many different disorders in the head and neck have similar if not identical symptoms. Shankland's<sup>9</sup> study indicates that six therapists, on the average, had been consulted for diagnosis and treatment by each of his patients. This demonstrates the therapist's difficulty in arriving at an accurate diagnosis as well as the frustration of patients who go from office to office in their quest for help to relieve their pain.

This study suggests that internal derangements of the TMJ, temporal tendonitis, and Ernest's syndrome all radiate pain to the ear, joint, temporal region, cheek, and neck with a limitation of opening of the mandible. Findings indicated that 38.24% of the subjects experienced internal derangements of the TMJ and 16.18% experienced temporal tendonitis in addition to a symptomatic stylomandibular attachment. Furthermore, 10.29% suffered from greater occipital nerve neuralgia<sup>32</sup> and 39.71% from myofascial pain dysfunction syndrome.<sup>34</sup> Involvement of one or both of the stylomandibular ligaments was as follows: 42.65% were bilateral; 32.35% involved the right ligament only; and 25% involved only the left ligament.

In Table V it can be seen that 55.80% (38) of those examined reported a traumatic episode as a precipitating cause of their pain. This, too, confirms the comments by Ernest et al.<sup>10</sup> that "Many patients with this disorder identify a traumatic event that precipitated their painful condition." In addition, flexion-extension injuries such as those in whiplash are known to cause symptoms similar to those of Ernest's syndrome.<sup>10, 35, 36</sup>

**Treatment**

In this study, successful treatment was defined as elimination of pain and restoration of normal ranges of motion of the mandible. As Table VII depicts, nonsurgical treatment for Ernest's syndrome was successful for 77.94% of the patients. Nonsurgical treatment consisted of local anesthetic blocking of the insertion of the affected stylomandibular ligament(s), localized injection of 1 cc of betamethasone sodium phosphate, and placing the patient on a soft diet. At times an exaggerated pain response was noticed approximately 6 to 12 hours after injection of the anesthetic. When this occurred, moist heat and appropriate analgesics were beneficial in relieving the pain reaction to the injection. This conservative treatment often was needed two, three, and even four times with a 2-week interval between each treatment.

Surgical management, if necessary, was performed by using a technique called radiofrequency thermoneurolysis.<sup>7, 37</sup> This procedure involved placing a radiofrequency needle, with the patient under local anesthesia and fluoroscopic examination, into the insertion of the stylomandibular ligament and creating an elliptical lesion, which apparently deinnervates the pain fibers (A delta and C fibers<sup>38</sup>) of the injured insertion of the ligament.

**SUMMARY AND CONCLUSIONS**

A clinical analysis of 68 patients diagnosed as suffering from Ernest's syndrome revealed:

1. Injury to the stylomandibular ligament is a real and frequent disorder causing craniomandibular pain.
2. Ages and sex differences, although variable, correspond to those reported elsewhere in the literature for craniomandibular pain.
3. A diagnosis of Ernest's syndrome may be based on an adequate history, palpation of the insertion of the stylomandibular ligament, and a diagnostic local anesthetic block of the affected ligamentous insertion.
4. Symptoms of Ernest's syndrome, in decreasing order of occurrence, are: TMJ and temporal pain, ear and mandibular pain, posterior tooth sensitivity, eye pain, and throat pain. In addition, shoulder pain may be involved.
5. Of the patients in this study, 77.94% were treated successfully via nonsurgical management of their complaints.
6. Resolution of this disorder is usually accomplished

by a combination of a diagnostic injection of local anesthetic at the insertion of the ligament, localized injection of cortisone substitute, and placing the patient on a soft diet.

7. Surgical management, if necessary, is best accomplished by a radiofrequency thermoneurolysis procedure in the involved ligamentous insertion.

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