

EVALUATION OF PTERYGOID MUSCLES IN PATIENTS WITH TEMPOROMANDIBULAR DISORDERS

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ABSTRACT

Functional disorders of masticatory muscles are the most common TMD complaints. Patients with these functional disorders usually present with myalgia. One key to locating the exact source of pain is that local provocation should accentuate it. While muscles such as masseter and temporalis may be easier to provoke by means of digital palpation, the same may not be applicable to the pterygoids. The anatomical location of the pterygoids makes their digital palpation rather difficult. Alternatively, these muscles can be functionally manipulated. No consensus has been achieved as to which method is better and the choice largely depends on dentist's preference. The aim of this study was to assess the preference of dentists belonging to different specialties regarding method of evaluation of pterygoid muscles during examination of a TMD patient. A self-administered questionnaire was distributed among 78 dentists from five different dental specialties serving in various dental institutes and private practices in Rawalpindi/Islamabad to assess the preferred method for evaluation of medial pterygoid, inferior lateral pterygoid, superior lateral pterygoid, masseter and temporalis muscles. Data were analyzed using SPSS. Descriptive statistics were calculated. Majority of the dentists preferred to evaluate temporalis and masseter by means of digital palpation. For superior and inferior lateral pterygoid muscles, majority of the dentists preferred using functional manipulation method while for medial pterygoid, most preferred a combination technique. The results of this survey endorse the practice of local dentists regarding evaluation of masticatory muscles as being at par with international standards and practices.

Key Words: Masticatory muscles, Pterygoid Muscles, Temporomandibular Joint, Temporomandibular joint disorders.

INTRODUCTION

Temporomandibular disorders (TMD) are a heterogeneous group of symptoms afflicting the temporomandibular joint (TMJ) and/or the muscles of mastication as well as the surrounding tissues.¹ The condition results in an abnormal, incomplete or impaired function of the TMJ. Symptoms of TMD can arise due to disorders pertaining to muscles or to the structural components of the joint, thus characterizing the disorder as being extra-capsular and intra-capsular respectively.² Functional disorders of masticatory muscles are the most common TMD complaints of patients seeking treatment in a dental office.³

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Muscles of mastication are the muscles associated with TMJ that are primarily involved in the act of mastication. They can be grouped as mandibular depressors (openers) and mandibular elevators (closers). The lateral pterygoid is the principal opener muscle and also a major contributor to both protrusion and lateral excursion of the mandible.⁴ Other mandibular depressor muscles include the geniohyoid, mylohyoid, and the digastric muscles. The principal mandibular elevators are the masseter, temporalis and the medial pterygoids.⁵ Of particular importance are the pterygoids especially the lateral pterygoid that is involved in almost all movements of the TMJ in one way or another and has been the subject of much debate over the years. The medial pterygoid muscle originates from the lateral pterygoid plate and the palatine bone and inserts onto the medial surface of ramus and angle of the mandible. The lateral pterygoid muscle comprises of two distinct heads. The superior head of the lateral pterygoid muscle originates on the infratemporal crest of the sphenoid bone and is attached to the articular disk. The inferior head comes from the lateral plate of the pterygoid process and inserts into the condylar process of the mandible.

Patients with functional disorders of the masticatory muscles usually present with myalgia or muscular pain.⁶ Where pain is the primary symptom, it is imperative that the source of pain be identified.⁷ One key to locating the exact source of pain is that local provocation should accentuate the pain.⁸ While muscles such as masseter and temporalis may be easier to provoke by means of digital palpation, the same may not be easily applicable to the pterygoids.

Studies supporting both schools of thought i.e. digital palpation and functional manipulation are available in literature. However, no consensus has been achieved as to which method is better. The choice of method largely depends on the dentist's preference. This cross-sectional survey, hence, aimed to assess the practice of local dental practitioners regarding the evaluation of muscles of mastication during TMJ evaluation. To the best of the authors' knowledge, scarcely any studies have reported any data in this context.

METHODOLOGY

A self-administered questionnaire was designed and pilot – tested prior to administration. Closed – ended questions pertaining to the number of TMD cases

diagnosed, ability to differentiate between intra- and extracapsular disorders and the preferred method for evaluation of medial pterygoid, inferior lateral pterygoid, superior lateral pterygoid, masseter and temporalis were asked. The questionnaire was then distributed among 78 dentists from five different dental specialties serving in various dental institutes and private practices in Rawalpindi/Islamabad. Data was analyzed using SPSS version 21. Descriptive statistics were calculated.

RESULTS

Of the 78 distributed questionnaires, all were filled and returned with a response rate of 100%. Majority (46.2%) of the study subjects belonged to Prosthodontics while the second highest number was that of Oral and Maxillofacial Surgeons (20.5%) (Table 2). Majority (84.6%) of the respondents were trainees in their respective fields (Table 3). The mean number of TMD cases diagnosed was 95.27 ± 239.57 (range 0 – 1000) with the maximum number of patients diagnosed by either prosthodontists or surgeons (Table 4). Regarding the ability to differentiate between intracapsular and extracapsular disorders, majority (60.3%) stated that they were not always

TABLE 1: QUESTIONNAIRE USED IN THE STUDY

1. Dental Specialty: Prosthodontics <input type="checkbox"/> OMFS <input type="checkbox"/> Operative Dent. <input type="checkbox"/> Orthodontics <input type="checkbox"/> General Dent. <input type="checkbox"/>			
2. Status: Consultant <input type="checkbox"/> Trainee <input type="checkbox"/> General Practitioner <input type="checkbox"/>			
3. No. of TMD Cases Diagnosed: _____			
4. Can you always differentiate between Intracapsular and Extracapsular Disorders? Yes <input type="checkbox"/> No <input type="checkbox"/> Not Always <input type="checkbox"/>			
5. Which method do you prefer for the evaluation of the following muscles?			
Muscle	Digital Palpation	Functional Manipulation	Combination of digital palpation and functional manipulation
i. Medial Pterygoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. Inferior Lateral Pterygoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii. Superior Lateral Pterygoid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv. Temporalis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v. Masseter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TABLE 2: DENTAL SPECIALTY OF STUDY SUBJECTS

Dental Specialty	Frequency (N)	Percent (%)
Prosthodontics	36	46.2
Oral & Maxillo-facial Surgery	16	20.5
Operative Dentistry	10	12.8
Orthodontics	15	19.2
General Dentistry	01	1.3

TABLE 3: CLINICAL STATUS OF STUDY SUBJECTS

Clinical Status	Frequency (N)	Percent (%)
Consultant	11	14.1
Resident	66	84.6
General Dental Practitioner	1	1.3

able to differentiate between the two (Table 5). Table 6 gives the method preferred by study subjects for evaluation of muscles of mastication.

TABLE 4: NUMBER OF TMD CASES DIAGNOSED BY STUDY SUBJECTS

No. of TMD cases diagnosed	Study subjects (N)	Minimum number of cases diagnosed	Maximum number of cases diagnosed	Mean	Standard Deviation
	78	0	1000	95.27	239.57

TABLE 5: ABILITY TO DIFFERENTIATE BETWEEN INTRACAPSULAR AND EXTRACAPSULAR DISORDERS

Question	Response (%)		
Can you always differentiate between Intracapsular and Extracapsular Disorders?	Yes	No	Not Always
	24.4	15.4	60.3

TABLE 6: METHOD PREFERRED BY DENTISTS FOR EVALUATION OF MUSCLES OF MASTICATION

Muscle	Percentage		
	Palpation	Functional Manipulation	Combination of Palpation & Functional Manipulation
Medial Pterygoid	20.5	29.5	50
Inferior Lateral Pterygoid	9	48.7	42.3
Superior Lateral Pterygoid	6.4	48.7	44.9
Temporalis	74.4	—	25.6
Masseter	76.9	—	23.1

DISCUSSION

A search of the literature reveals that most of the articles published globally on TMDs either discuss newer management therapies or describe the general examination process for TMJ. The proponents of digital palpation and functional manipulation of muscles have only highlighted their proposed method and negated the other. However, there is a lack of data reporting the exact practice of dentists regarding evaluation of muscles of mastication. Since TMD are quite prevalent⁶, it is necessary to assess and report the practice of treating dentists regarding diagnosis of TMD.

The anatomical location of the pterygoids makes their digital palpation rather difficult. Proponents of digital palpation of lateral pterygoid muscle suggest asking the patient to open his mouth wide and laterally towards the side that needs to be assessed. The examiner should place his index or little finger at the maxillary third molar area and to move it posteriorly, superiorly and medially behind the tuberosity until the outer surface of lateral pterygoid plate is reached.⁹ The palpation crosses over the superior section of the medial pterygoid muscle during this step. Palpation of medial pterygoid itself requires placing the finger in the lateral aspect of the pharyngeal wall of the throat – a process not only difficult but highly uncomfortable for the patient.³ Other clinicians, however, raise doubts about the palpability and the reliability of palpation of pterygoid muscles.¹⁰ They believe that these muscles can be better evaluated by means of “functional manipula-

tion”. The concept of functional manipulation is based on the principle that if a muscle is deranged, further function i.e. flexion or extension during movements will elicit increased pain.⁷

In the present study, majority of the dentists preferred to evaluate temporalis and masseter by means of digital palpation. This practice is in consistence with the methods described in literature for assessing these muscles.^{3,7,11,12,13} The anatomical location of these two muscles allows ease of access without any unnecessary discomfort to the patient, making digital palpation easy. Hence, the results of digital palpation are not only highly reliable but also repeatable with a valid diagnostic value. Majority of the study participants stated that they could not always differentiate between extra- and intra-capsular disorders. However, since most of the participants are trainees, it is expected that they'll learn with time and experience.

In contrast, for the evaluation of superior and inferior lateral pterygoid muscles, majority (48.7%) of the dentists preferred using functional manipulation method. This practice again is in accordance with the published literature.^{7,8,11,13} A very small number of the study respondents preferred using digital palpation to evaluate lateral pterygoid muscles. For evaluation of medial pterygoid muscles, 50% of the dentists preferred using a combination technique while 30% advocated the use of functional manipulation alone. As mentioned earlier, the pterygoids reside deep within the skull and cannot be easily approached. Although digital palpation

of these muscles can be attempted, the process would be highly uncomfortable for the patient and may elicit a painful response even before the muscle is provoked.³ Any diagnostic measure for a medical or dental condition must be reliable (i.e. replicable, reproducible and consistent) and valid.¹⁰ In this case, however, the reliability and validity of digital palpation for evaluation of pterygoid muscles is questionable. Nevertheless, if paired with a suitable modern diagnostic imaging modality such as MRI or EMG, digital palpation of these muscles may yield better results.⁹

The results of the present study endorse that the practice of local dentists regarding evaluation of muscles of mastication follow the international standards. This study, however, has its own share of limitations. Being a questionnaire – based study, it is subject to the reporting bias of study participants. Majority of the participants were residents; hence, their knowledge might be limited and devoid of experience. Secondly, the sample size was comparatively small. Third, there are no similar studies to which the results of the present study can be compared. Furthermore, it was observed that, owing to increased specialty-based practice, dentists from orthodontics and operative dentistry did not encounter a lot of patients presenting with the signs and symptoms of TMD. Although TMJ evaluation is part of general examination of the head and neck region, orthodontists and operative dentists do not routinely practice this examination in their respective fields and may not be familiar with the current examination protocols. It is, therefore, suggested to conduct further studies with a larger and diverse sample, specifically targeting the prosthodontists and maxillofacial surgeons who frequently treat TMD patients. This will help assess the practices of local dentists and compare them against universal standards.

CONCLUSIONS

Within the limitations of this study, the following conclusions can be drawn:

Majority of the local dentists prefer digital palpation method to evaluate temporalis and masseter muscles during TMJ examination.

For evaluation of pterygoid muscles, majority of the local dentists prefer functional manipulation method.

There is a need to conduct further research to assess the diagnostic practices of local dentists and compare them against universal standards.

RECOMMENDATIONS

It is recommended that all dental practitioners, irrespective of their specialty, should make themselves proficient in all diagnostic procedures esp. the examination of head and neck region. Since we are a developing country, superior diagnostic modalities such as MRI and EMG may not be available at every hospital. This, therefore, requires the dentist to be well-versed with conventional diagnostic techniques. Moreover, dentists should seek to revisit and refresh their basic knowledge by attending continuing dental education programs.

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| 2 Ayesha Aslam: | Data Analysis + Manuscript writing. |
| 3 Abdul Rehman: | Data Collection + Critical revision. |
| 4 Syed Hammad Hassan: | Study concept + Data Collection. |