Revista de Ciencias Médicas de Pinar del Río

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6681

ARTICLE REVIEW

Temporomandibular Joint Dysfunctions and dental malocclusion

Disfunciones de la Articulación Temporomandibular y maloclusión dentaria

Lourdes Elizabeth Menéndez-Oña[1], Gabriela Ximena Marín-Vega[1], Ariel Shande Guamán-Veloz[1]

[1]Universidad Autónoma de los Andes extensión Quevedo.

Received: February 14, 2025
Accepted: February 21, 2025
Published: February 26, 2025

Citar como: Menéndez-Oña LE, Marín-Vega GX, Guamán-Veloz AS. Disfunciones de la Articulación Temporomandibular y maloclusión dentaria. Rev Ciencias Médicas [Internet]. 2025 [citado: fecha de acceso]; 29(2025): e6681. Disponible en: http://revcmpinar.sld.cu/index.php/publicaciones/article/view/6681

ABSTRACT

Introduction: temporomandibular joint dysfunctions explain the anomalies of this anatomical structure that consists mainly of bone, muscle and connective tissue, altering its function, which consists of making significant movements of the mandible from left to right or vice versa, so one of the etiologies are trauma, blows and bruxism, which cause dental malocclusion, which produces a variation in the vertical dimension of the occlusion establishing an imbalance in all adjacent tissues.
Objective: to determine the treatment of temporomandibular joint dysfunctions related to dental malocclusion.
Methods: the approach applied is qualitative; descriptive type of research, and its main tool is the bibliographic review.
Results: they show that the most effective treatment used is the combination of pharmacotherapy, hyaluronic acid, corticosteroids; with the help of alternative therapies such as physiotherapy, apitherapy, arthrotherapy, ozone therapy.
Conclusions: the best alternative is to adjust first of all the dental occlusion because this has repercussions on the activity of the masticatory muscles, with the emission of symptoms and signs such as pain, articular noises and alterations of the different mandibular movements caused by occlusal disharmony.

Keywords: Temporomandibular Joint; Occlusion; Dysfunction; Malocclusion.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6681

RESUMEN

Introducción: las disfunciones en la articulación temporomandibular explican las anomalías de esta estructura anatómica que consiste principalmente en tejido óseo, muscular y conectivo, alterando su función, la cual consiste en realizar movimientos significativos de la mandíbula de izquierda a derecha o viceversa, por lo que una de las etiologías son los traumas, golpes y bruxismo, los mismo que causan una maloclusión dentaria, la cual produce una variación en dimensión vertical de la oclusión estableciendo un desequilibrio en todos los tejidos adyacentes.
Objetivo: determinar el tratamiento de las disfunciones de la articulación temporomandibular relacionado a la maloclusión dentaria.
Métodos: el enfoque aplicado es el cualitativo; tipo de investigación descriptiva, y su principal herramienta la revisión bibliográfica.
Resultados: demuestran que el tratamiento más efectivo utilizado es la combinación de farmacoterapia, ácido hialurónico, corticosteroides; con ayuda de terapias alternativas como fisioterapia, apiterapia, artroterapia, ozonoterapia.
Conclusiones: la mejor alternativa es ajustar en primer lugar la oclusión dentaria debido a esta repercute en la actividad de los músculos de la masticación, con la emisión de síntomas y signos como el dolor, ruidos articulares y alteraciones de los diferentes movimientos mandibulares provocados por la desarmonía oclusal.

Palabras Clave: Articulación Temporomandibular; Oclusión; Disfunción; Maloclusión.

INTRODUCTION

One of the most important and complex joints in the human body is the temporomandibular joint (TMJ).[1] This joint is made up of two surfaces surrounded by fibrocartilage and a central articular disc; this disc divides the joint into two spaces: an upper or translational one and a lower or rotational one.[2]

On the other hand, the term dysfunction refers to anomalies, in the case of TMJ which is defined as the atypical relationship between the articular disc and the mandibular condyle, the joint level and the glenoid fossa of the temporal bone.[3]

The importance of this topic means that every day there are more people with dental malocclusions and temporomandibular joint dysfunctions, making these pathologies two important oral health conditions that affect a significant proportion of the population. A thorough understanding of the stomatognathic system is essential in a dental career, as it encompasses various structures that comprise it and grant it specific functions. Dental occlusion is one of the most important topics in this field, as it studies the relationships between teeth, the skeletal structures involved, the function of the TMJ, and more. In the health field, research and ongoing education are necessary to provide our patients with the best possible care and guide them correctly regarding the treatments they should take according to each pathology.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2025; 29(2025): e6681

It is estimated that between 70 % and 90 % of the world's inhabitants reflect some sign or symptom of TMJ dysfunction.[4] In turn, at the Latin American level, in Mexico in 2021 a study was carried out in which it was determined that the percentage of people with temporomandibular dysfunction (TMD) is close to 20 % in children, in adolescents it reaches 35%, while in adults it totals 49 %;(5) While in Peru, 35,6 % of people suffering from TMD were female, especially in the 30-39 age group.[6]

Likewise, in a study carried out in the city of Cuenca (Ecuador) with a sample of 316 patients, 65,8 % of whom suffered from temporomandibular disorder (TMD).[4] It is currently known that this alteration is of multifactorial origin, since factors such as age, sex, systemic, psychological, psychosocial disorders, bruxism, mechanical overload and trauma are integrated.[7,8] Due to its etiology, there is no single cure for these conditions, but a form of multidisciplinary therapy has been agreed upon that combines functional and surgical therapy when required.[9]

Vásconez mentions that: "Le Bell suggested the term temporomandibular disorders to classify them not only in terms related to the joints but also in functional disorders of the masticatory system that include psychosocial aspects that can be triggers and affect the daily life of the individual suffering from this disease."[10]

Likewise, Meyer in 1997 mentions that: "bruxism is an activity without functional purposes in which it occurs in adolescents and adults; with a prevalence of 20 % and decreases with age. The most common symptoms related to bruxism are muscle stiffness and pain, which in turn are factors that alter the temporomandibular joints".[11]

Despite all the etiologies found, Bhavna mentions that: "multiple studies show that patients with malocclusion may have a higher prevalence of temporomandibular joint dysfunction, since both are closely related anatomically".[12] For this reason it is imperative to ask: what is the treatment for temporomandibular joint dysfunctions related to dental malocclusion?

Despite their prevalence, TMJ dysfunction and dental malocclusions are often not adequately treated or given the attention they deserve. This raises a number of questions and challenges:

Underestimated Diagnosis: Lack of awareness on the part of both patients and some health professionals about the symptoms and consequences of TMJ dysfunction and malocclusions can lead to underdiagnosis and postponement of necessary treatment.

Impact on Quality of Life: People suffering from these conditions often experience chronic facial pain, limited food intake, and speech difficulties. This can negatively impact their quality of life, affecting their emotional, social, and functional well-being.

Lack of Knowledge of Treatment Options: There is a lack of information about the treatment options available to address TMJ dysfunction and dental malocclusions. This can lead to patients not seeking appropriate care and resigning themselves to living with discomfort.

Challenging Multidisciplinary Approach: Treating these conditions often requires a multidisciplinary approach involving dentists, orthodontists, physical therapists, and other healthcare professionals. Coordinating this type of treatment can be complicated and lead to delays in care.

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Cost and Accessibility: Some therapies and treatments for TMJ dysfunction and dental malocclusions can be expensive. This can be a barrier for those who lack access to oral health services or medical coverage.

The general objective of the following investigation is to determine the treatment of temporomandibular joint dysfunctions related to dental malocclusion.

METHODS

This work has a qualitative approach; descriptive research allows for the characterization of temporomandibular joint dysfunctions and dental malocclusion. Bibliographic research is used to acquire the necessary information, incorporating secondary sources such as books and scientific articles published in various databases, such as Scielo, Elsevier, Dialnet, and others.

The research method used is inductive-deductive, since general conclusions will be drawn from specific premises, and induction will be made as the research progresses; and analytical-synthetic. This research is feasible because we have the necessary resources to carry out the work; access to bibliographic resources, including secondary sources such as scientific articles, books, and doctoral theses, all of which have a solid scientific basis; and human talent.

Scientific observation was chosen as the technique, reviewing bibliographic documentation both for the theoretical framework and in the analysis of the articles in the bibliographic review.
Population: Because this study is documentary in nature and offers a proposal to address the problems encountered, this impacts the study of the articles studied.

DEVELOPMENT

Basis: Theoretical Dental Occlusion and Malocclusion

It is defined as the proper contact between the incisal and occlusal surfaces of the upper and lower jaws, resulting in dental harmony; it refers to closure and movements, but mainly to the antagonistic closure of the teeth from a strict and etymological point of view. Like any aspect of science, as the study of occlusion is carried out, it can be seen that it has various types, lines, planes; in turn, when there are irregularities both aesthetic and functional and this occlusion alters oral health, a condition known as malocclusion occurs, which can cause problems in the temporomandibular joint.[13]

Angle Classification: The most common method used to classify malocclusions is called the Angle classification, and it is divided into three classes. Mario Figún comments that: "there are two types of relationships in the ideal occlusion: molar and canine".[14] Therefore, it can be described that within the molar relationship classification there is class I, which is when the mesiobuccal cusp of the upper first molar is aligned with the buccal groove of the lower first molar; class II is when the mesiobuccal cusp of the lower first molar is aligned with the buccal groove of the upper first molar; finally, class III is when the mesiobuccal cusp of the upper first molar is located over the interproximal space between the lower first and second molars. [13,14]

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Within the first classification of the canine relationship is class I, which is the ideal or correct occlusion of the canine, it develops when the canine of the upper arch falls correctly right in the space provided by the canine and the first premolar of the lower arch; class II has the capacity to also be called canine disto-occlusion class, it originates when the canine of the upper arch occludes a little further forward of the interproximal space between the canine and the first premolar; finally there is class III or also called mesio occlusion class, it develops when the cusp of the canine of the upper arch occludes further back than the interproximal space of the canine and the first lower premolar, that is, it has a sunken appearance in relation to the space provided by the canine and the first premolar of the lower arch.[14]

Structures involved in occlusion: The various anatomical structures that make up the mandibular locomotor system are those that define occlusion; these structures allow both active and passive movements and postures of the mandible. The functional activity of this system is entirely driven by the action of the muscles under the control of the neuromuscular mechanism; we refer to this as the fundamental motor-dynamic determinant of occlusion; while the teeth, periodontium and TMJ are passive elements.[15]

Temporomandibular Joint: It is an anatomical structure consisting mainly of bone, muscle and connective tissue, its function is to perform significant movements such as opening, closing, protrusion, retrusion and lateralization of the jaw from left to right or vice versa, it is made up of a disc-shaped fibrocartilaginous tissue that divides the joint into two portions, the upper and lower, protecting it from friction during movement; synovial cavity; articular cartilage and a capsule that covers the same joint, inside we find synovial fluid and several ligaments, joining the temporal bone cavity with the head of the mandibular condyle. [16]

The TMJ is made up of bony structures such as the mandibular condyle to the base of the skull through the squamous portion of the temporal bone.[17] Avascular fibrocartilaginous structures such as the joint capsule, which in turn is formed by external or temporomaxillary fibers, and internal fibers such as the temporomeniscal; the articular meniscus with two concavities, located inside the joint capsule between the mandibular condyle and the glenoid fossa.(16) Ligamentous structures that are classified into two: intracapsular ligaments and extracapsular ligaments, within the first category is the posterior ligament or bilaminar zone, lateral collateral and medial collateral; while within the second category are the sphenomandibular, stylomandibular and pterygomandibular ligaments.[16,17]

Physiology of the TMJ: It can be divided into two categories: rotation and translation; Rotatory movements occur at the lower joint while translational movements occur at the upper joint. Rotational movement occurs when the mouth opens and closes around a fixed point located on the mandibular condyles; movement that occurs around an axis, whether active or passive, is called bony rotation. Rotation can occur in any of the three planes, with the sagittal plane rotating around a horizontal axis producing the greatest movement; in a hinge-like manner in a healthy joint; the physical movement of rotation produces joint movement that includes linkage and gliding (arthrokinematics), as represented by the mandibular condyle, which rolls and slides along the inferior concave part of the articular disc.

While the movement of a bone along an axis and with respect to the plane that defines it as bone translation movement when the entire bony portion moves in a straight line at the same distance, direction and speed; this occurs between the superior surface of the articular disc and the glenoid surface of the temporal bone within the superior disc compartment, the condyle and the articular disc slide together with respect to the articular surface of the glenoid cavity and the temporal eminence; this movement with deceleration can occur in the anterior or posterior directions, as well as in the medial lateral directions.[18]

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Muscles of mastication: The temporomandibular joint is capable of producing movements such as opening and closing the mouth; lateral movements called left and right lateral protrusion and retrusion. These movements are activated by muscles attached directly to one of the two bony levers.

Among the important muscles for these jaw movements are: the masseter muscle, which is shaped like a rectangular polygon originating in the zygomatic arch and running to the lateral side of the lower edge of the ramus of the mandible; it facilitates the protrusion of the lower jaw and applies pressure during mastication.[19]

The temporal muscle is located in a fan-shaped silhouette originating in the concha of the temporal bone and in the lateral portion of the skull. When this muscle contracts, the lower jaw rises and the teeth come into contact. If the contraction is in the front, it raises the jaw vertically, and when the contraction is in the middle section, it raises and lowers the jaw.

In the case of the internal pterygoid muscle, it begins in the pterygoid fossa, running downwards, backwards and outwards to insert along the medial space of the angle of the mandible, attached to the masseter. When the fibers of the internal pterygoid muscle contract, the lower jaw rises and the teeth come into contact, participating in protrusion.[20]

As for the external pterygoid muscle, it is divided into two portions, one inferior and one superior: the inferior originates in the external portion of the lateral pterygoid plate and runs backward, upward and outward, inserting into the neck of the condyle, producing the protrusion of the lower jaw; on the other hand, the superior one is smaller and begins in the infra temporal portion of the wing of the sphenoid, running to the joint capsule, in the disc and neck of the condyle; it is activated when chewing with pressure and contacting teeth.[19]

Temporomandibular joint dysfunction: Temporomandibular joint disorders are a complex and heterogeneous group of diseases and clinical disorders affecting the temporomandibular joint, masticatory muscles, teeth, and supporting apparatus. They represent a major topic in the field of health for dentists. Considerable controversy exists regarding their etiology, diagnosis, and treatment.[21]

Etiology: TMJ dysfunctions can result from macrotrauma or microtrauma, such as direct blows, facial trauma, and excessive open-mouth injuries during dental and/or surgical procedures. Low-intensity repetitive stress is called microtrauma; as can nail biting, excessive lateral jaw play, and bruxism.[22]

Signs and Symptoms of TMD: The signs and symptoms of temporomandibular disorder appear in the head or neck with symptoms such as: pain in the temporomandibular joint, clicking, clicking or gurgling, sounds or sensations in the jaw joint when eating and opening the mouth, at the facial level it produces muscle spasms, ear pain, neck pain, headache, swelling on one or both sides of the face.[23]

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Imaging diagnosis of TTM: In imaging, there are different types of images that can be used to identify any abnormality occurring in the TMJ, but the most commonly used are the following:

Radiography: Within this category is the orthopantomographic or panoramic radiograph in which asymmetries, erosions, osteophytes, and fractures can be seen in the condyles of the lower jaw, but also as a drawback they present visual distortions and challenges caused by the superposition of the eminence that superimposes the base of the skull and the zygomatic arch; secondly is the lateral radiograph open and closed mouth due to the projection of a more precise diagnosis of the causes of some of the pain or discomfort of the patient without injuries or obvious injuries.[24,25]

In third place is the transpharyngeal radiograph with a projection closer to reality, but it only provides information on the condyles; in fourth place is the transcranial radiograph, which reveals alterations in the bone tissue of the condyles and temporal fossa. The complication with these images is that they superimpose the ipsilateral petrous portion on the neck of the condyle, distorting the image; in fifth place is the transorbital or anterosuperior image, which displays the mediolateral region of the eminence, the neck of the condyle, and its head. It helps in the diagnosis of fractures, especially subcondylar fractures, and provides superior results to tomography. The only difficulty is that if the condyles do not move and the crest cannot be reached, only the neck is seen, providing little information.

Conventional tomography: It provides a better image of the articular surface and a better assessment of the position of the condyles within the fossa, allowing for better detection of deformities and bone changes as sagittal plane projections; however, it has a disadvantage of cost and discomfort compared to traditional radiography.[24]

Computed tomography (CT): Detailed visualization of bone structure, evaluation of soft tissue associated with the temporomandibular joint, the ability to create specific reconstructions, and the ability to view 3D images; like the previous one, it has the disadvantage of its price and differences in image quality due to variations in scanners and sensors.[25]

Magnetic resonance imaging: It is noninvasive, radiation-free, easy to interpret, and highly sensitive to ligament, bone, and disk anatomy. It can take clear photographs; however, it is expensive, incapable of visualizing the posterior cruciate ligament perforation, limited static images, difficult to obtain high-quality images, and is not used in patients with pacemakers or prostheses.[24,25]

Arthrography: It allows soft tissue observation, can be used to assess disk and condyle motion, and is very useful for disk perforation; however, it requires special training. It is invasive, painful, and causes significant radiation exposure for the patient. In addition, in the temporomandibular joint, extension due to the design of the joint structure and traction on the superior lateral pterygoid muscle can cause some anterior displacement of the intervertebral disk.[24]

Analysis of results: To support the study, 15 research papers were considered, which characterize the year, title, objective, and results of each case.

Al-Ani et al. (2017): This study sought to evaluate the effectiveness of treatments for temporomandibular joint dysfunction and dental malocclusion. The results demonstrated that treatments for these conditions are effective in most cases.

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Al-Khotani et al. (2016): The research aimed to examine the relationship between temporomandibular dysfunction and dental malocclusion in orthodontic patients. It was concluded that these two conditions are related in patients receiving orthodontic treatment.

Al-Saleh et al. (2015): This study conducted a systematic review and meta-analysis to assess the prevalence of temporomandibular dysfunction and dental malocclusion in orthodontic patients. The results indicated that the prevalence of these conditions is high in this patient group.

Bumann et al. (2018): The objective of this systematic review was to evaluate the effects of surgical treatments for temporomandibular joint dysfunction and dental malocclusion in adults. These treatments were found to be effective in some cases.

Siéssere S. (2020): This study evaluated the relationship between different types of malocclusion and TMJ dysfunction in adolescents. The results showed that Class II malocclusion and posterior crossbite are associated with a higher prevalence of TMJ dysfunction.

Shaghaghian S. (2019): The study investigated the prevalence of TMJ dysfunction in patients undergoing orthodontic treatment. The results showed that orthodontic treatment had a positive effect on reducing the prevalence of TMJ dysfunction.

De Felício et al. (2015): The association between oral parafunctional/nociceptive behaviors and TMD pain was evaluated in children with primary teeth. A significant relationship was found between these behaviors and TMD pain in children.

De La Torre Canales et al. (2017): This study determined the prevalence of temporomandibular disorders in patients with rheumatoid arthritis. The results showed a prevalence of 47,4 % in this patient group.

De Souza et al. (2016): The study evaluated the association between anxiety and temporomandibular disorders. The results revealed a significant association between anxiety and these disorders.

Emodi-Perlman et al. (2016): The objective was to evaluate the effects of mandibular exercise therapy for temporomandibular dysfunction and dental malocclusion. The results indicated that this treatment is effective in some cases.

Gauer et al. (2015): This study answered common questions about the diagnosis and management of temporomandibular disorders. It concluded that these disorders are common and can be managed with a variety of nonsurgical treatments.

Gomes et al. (2016): This study evaluated the association between parafunctional oral habits and temporomandibular disorders in adolescents. A significant association was found between these habits and temporomandibular disorders.

Michelotti A. (2021): The study investigated the relationship between different occlusal schemes and TMJ dysfunction in adults. The results indicated that there were no significant differences in the prevalence of TMJ dysfunction between these occlusal schemes.

Feteih RM. (2016): The objective was to identify the signs and symptoms of TMJ dysfunction in patients with malocclusion. The results indicated that TMJ pain, clicking, and limited mouth opening were the most common symptoms in patients with malocclusion.

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Al-Moraissi EA. (2020): The study determined the prevalence of TMJ dysfunction in patients undergoing orthodontic treatment. The results showed that the prevalence of TMJ dysfunction decreased after orthodontic treatment in most patients.

Proposal
Treatment plan for temporomandibular joint dysfunction and dental malocclusion

Phase 1: Evaluation and Diagnosis
Objective: To perform a comprehensive evaluation of the patient's condition, identifying the presence of TMJ dysfunction and dental malocclusion.
Activities:
Clinical interview and collection of medical and dental history: The process begins with a detailed conversation with the patient. Data is collected on current symptoms, history of jaw problems, and relevant medical history. Information such as parafunctional habits, stress, and trauma are also recorded.
Physical and radiographic examination of the craniofacial region: The doctor performs a thorough physical examination of the face, head, and jaw. Signs of dental wear, facial asymmetry, joint clicking, and limited mouth opening are all examined. In addition, X-rays (panoramic, lateral, and cephalometric) provide an internal view of the dentofacial anatomy and structure.
Occlusion assessment: This examination examines how the upper and lower teeth fit together when the mouth is closed. This includes checking the bite, the distribution of pressure on the teeth, and the relationship between the dental arches.
Examination of muscles and joints: The jaw muscles are palpated to detect areas of pain, tension, or spasms. Jaw movements are also assessed, looking for joint sounds such as clicking or crackling.
Questionnaires and evaluation scales: Some standardized questionnaires can help quantify symptoms and their impact on a patient's quality of life. These questionnaires address areas such as pain, jaw function, and discomfort level.
Responsible: Dentist specializing in TMJ dysfunction and dental malocclusion.

Expected results:
At the end of this phase, we hope to gain a complete understanding of the patient's condition in relation to temporomandibular joint dysfunction and dental malocclusion. An accurate diagnosis will allow for the design of a personalized treatment plan that addresses the patient's individual needs and goals. The information gathered will also serve as a baseline for evaluating treatment progress over time.

Phase 2: Treatment Planning

Aim: Design a personalized treatment plan based on the diagnosis, considering the patient's needs and goals.
Activities:
Establishing treatment goals and objectives: In collaboration with the patient, clear and achievable treatment goals are defined. These goals may include pain reduction, improved jaw function, and correction of malocclusion.
Selection of appropriate treatment methods and techniques: The professional determines the specific strategies to be used to address temporomandibular joint dysfunction and dental malocclusion. This may include conservative therapies, orthodontics, jaw exercises, and more.

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Consideration of the patient's age and health status: The patient's age and overall health are taken into account when designing the treatment plan. This can influence the treatment options and the estimated duration of the process.
Interdisciplinary coordination: If necessary, we collaborate with other healthcare professionals, such as physical therapists, orthodontists, or maxillofacial surgeons. This ensures a comprehensive and complete approach to addressing all aspects of the problem.
Patient education and counseling: The patient is provided with detailed information about the proposed treatment plan, including the procedures involved, expected benefits, and potential complications. Questions are answered, and expectations are clarified.
Responsible: Dentist specializing in TMJ dysfunction and dental malocclusion.

Expected results:
At the end of this phase, a comprehensive, personalized treatment plan tailored to the patient's specific needs and goals is expected. Careful planning ensures that the most appropriate therapeutic approaches are chosen to address both temporomandibular joint dysfunction and dental malocclusion. Furthermore, the education and counseling provided will help the patient understand the process and maintain realistic expectations about treatment outcomes.

Phase 3: Treatment of TMJ Dysfunction

Objective: To reduce TMJ dysfunction and relieve associated pain.
Activities:
Relaxation therapy and stretching exercises: The patient is taught muscle relaxation techniques and stretching exercises to relieve tension in the jaw muscles and reduce stress on the temporomandibular joint.
Use of occlusal splints and mandibular advancement devices: Night splints can be used to protect the teeth and reduce pressure on the joint during sleep. Mandibular advancement devices may also be recommended to reposition the jaw and improve function.
Manual therapy and physiotherapy: Manual therapy and physical therapy techniques are used to relieve muscle tension, improve circulation, and promote relaxation of affected tissues.
Education on postural and parafunctional habits: The patient is provided guidance on how to maintain good posture, avoid habits such as clenching or grinding teeth, and how to apply stress-relief techniques in their daily lives.
Pain control: In cases of acute pain, painkillers or anti-inflammatory drugs may be prescribed to relieve discomfort. Local treatments such as cold or heat can also be applied.
Responsible: Dentist specializing in TMJ disorders and malocclusion, and physical therapist if necessary.

Expected results:
At the end of this phase, the patient is expected to experience a significant reduction in TMJ dysfunction and associated pain. Therapeutic activities aimed at improving temporomandibular joint function, reducing muscle tension, and promoting greater comfort in the jaw and surrounding area. Education on healthy habits also empowers the patient to take preventive measures and practice self-care.

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Phase 4: Treatment of Dental Malocclusion

Objective: Correct malocclusion and improve dental alignment.
Activities:
Fixed or removable orthodontics: Orthodontics is used to move teeth into their ideal positions. Fixed braces and wires or removable appliances, such as clear aligners, may be used depending on the severity of the malocclusion.
Selective tooth extractions: In some cases, tooth extractions are necessary to create space and allow the teeth to move correctly into their desired position.
Use of braces and elastics: Orthopedic appliances can be used to influence jaw growth and development in young patients. Elastics can also be used to correct bite and alignment.
Constant evaluation and adjustment of orthodontic treatment: Throughout the process, regular visits are made to adjust brackets and wires and ensure that treatment is proceeding as planned.

Responsible: Orthodontist.
Expected results:
At the end of this phase, the patient is expected to have experienced significant correction of the malocclusion and improved tooth alignment. Orthodontics, along with the techniques and appliances used, will help achieve a functional bite and improved dental aesthetics. Consistent adjustments and monitoring by the orthodontist will ensure that treatment progresses as planned and the desired results are achieved.

CONCLUSIONS

The term occlusion refers to the misalignment of teeth. When teeth are out of harmony, a malocclusion occurs due to tooth loss, poor tooth position, altered jaw development, or long-term oral habits that result in temporomandibular disorders. These disorders, or TMD, are described as a subgroup of facial pain problems involving the TMJ, masticatory muscles, and associated musculoskeletal structures of the head and neck, as well as dental occlusion.

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