



## Impacted Third Molars Associated with TMJ Disorders: A Review

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### ABSTRACT

Impacted third molars, commonly known as wisdom teeth, have been linked to temporomandibular joint (TMJ) disorders, which are characterized by pain and dysfunction in the jaw and associated structures. Various factors, including crowding, pain referral, occlusal interference, and inflammation, contribute to TMJ discomfort. The literature indicates that extraction of impacted third molars poses a significant risk for TMJ complications, influenced by factors such as the position of the tooth and the experience of the operator. Effective treatment strategies involve counseling, surgical intervention, and the use of intraoral appliances, tailored to individual patient needs. Understanding these dynamics is crucial for clinicians to optimize treatment outcomes and enhance patient quality of life. Studies highlight the influence of impaction type, with horizontal impactions presenting the greatest risk for TMJ problems. Treatment strategies for both TMJ and impacted molars are outlined, emphasizing the importance of recognizing potential interactions and tailoring management plans accordingly. This review explores the complex relationship between impacted wisdom teeth and temporomandibular joint (TMJ) disorders.

**Keywords:** Impacted Third Molars, Temporomandibular Joint Disorders, TMJ, Orofacial Pain, Extraction

### Introduction

Temporomandibular Joint (TMJ) disorders refer to a group of conditions affecting the temporomandibular joint, the muscles responsible for jaw movement, and the associated structures. These disorders are a major source of orofacial pain, significantly impacting a patient's quality of life and functional abilities. TMJ disorders present with various symptoms, such as jaw pain, limited movement, clicking or popping sounds in the joint, headaches, and ear discomfort.<sup>1</sup> Temporomandibular disorders (TMD) is a term that describes a range of clinical issues involving the masticatory muscles, the temporomandibular joint, or nearby structures.<sup>2</sup> Common symptoms include restricted or deviated jaw movements, pain in the muscles or TMJ during function, and TMJ sounds. These conditions are more commonly seen in women aged 20–40 years, with a prevalence rate of around 30% in adults.<sup>3</sup> The association between impacted third molars and temporomandibular joint (TMJ) disorders has been a subject of considerable debate within the fields of dentistry and oral maxillofacial surgery. Impacted third molars, commonly known as wisdom teeth, are frequently encountered dental anomalies that can lead to various complications, including infection, crowding, and alignment issues.<sup>4</sup> In recent years, the potential link between impacted third molars and TMJ disorders has garnered attention due to the complex interplay between jaw alignment, occlusal interference, and muscular strain associated with these impactions. TMJ disorders encompass a range of conditions affecting the temporomandibular joint and surrounding structures, often resulting in pain, limited jaw mobility, and functional impairment.<sup>5</sup> Although multiple factors are known to contribute to TMJ disorders, including genetic, anatomical, and behavioral factors, the possible role of impacted third molars in either precipitating or exacerbating TMJ symptoms remains an area of ongoing research. The relationship between impacted third molars and temporomandibular joint (TMJ) disorders is complex and multifaceted. Various studies indicate that the type and position of impacted third molars can significantly influence the development and severity of TMJ disorders.<sup>6</sup> This review aims to explore the current understanding of the relationship between impacted third molars and TMJ disorders.

### The Relationship

Impacted third molars can lead to various issues that affect jaw alignment and contribute to TMJ discomfort or disorders. When there isn't sufficient space in the dental arch, impacted third molars can cause crowding, which affects jaw alignment and occlusion, placing additional stress on the temporomandibular joint (TMJ). Pain from impacted wisdom teeth may radiate to surrounding areas, including the jaw, neck, and ears, causing increased muscle tension in the muscles used for chewing. This tension can contribute to TMJ discomfort. Additionally, impacted molars may create occlusal interferences, leading patients to subconsciously adjust their bite, which further stresses the TMJ; in some cases, this can lead to bruxism, or teeth grinding, that exacerbates TMJ issues. Impacted or partially erupted molars are also prone to infection, which can trigger inflammation that may extend to the TMJ area, especially if accompanied by lymph node swelling, potentially worsening TMJ pain. Furthermore, surgical removal of impacted molars can also lead to TMJ discomfort, as prolonged mouth opening during the procedure and post-operative changes in jaw alignment and muscle tension may aggravate TMJ symptoms.<sup>7,8</sup>

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## Review of literature

Huang et al. highlighted that third molar extractions, classified as traumatic events, exhibit a high odds ratio for TMD development compared to controls, emphasizing surgical trauma as a significant factor in TMD onset.<sup>9</sup> Akhter et al. further proposed that jaw injury and third molar extractions may act as cumulative or precipitating factors in TMD development, a finding that aligns with Damasceno et al., whose systematic review suggested that TMD symptoms post-extraction could be influenced by factors such as third molar location, impaction severity, patient age, and gender.<sup>10,11</sup> In contrast, Juhl et al. presented a differing perspective, finding an insignificant risk of TMD six months post-third molar extraction, which suggests that any TMD symptoms may be temporary rather than long-term.<sup>12</sup> Additionally, Dolatabadi and Eshagh explored the impact of excessive force during student-led extractions, observing a high prevalence (50–63%) of TMJ injuries, thereby raising questions about the influence of experience level on TMD development post-extraction.<sup>13</sup> Raustia and Oikarinen noted that even when experienced oral surgeons performed the extractions, 16% of patients reported severe TMD pain post-surgery, indicating that while operator skill and technique could play a role, they may not completely mitigate the risk of TMD.<sup>14</sup> Sahebi et al. extended the discussion by examining prolonged dental treatments, such as endodontic therapy, and found that the duration of treatment and prolonged mouth opening could contribute to TMD and masticatory pain, especially in procedures conducted by novices. They suggested that improved treatment efficiency and shorter procedural time, potentially achievable by specialists, may reduce the risk of TMD. Collectively, these studies suggest that third molar extractions are a significant risk factor for TMD development, with surgical trauma, procedural force, and operator experience all playing critical roles in patient outcomes.<sup>15</sup> In a study by DeAngelis et al., 13.3% of patients exhibited signs and symptoms related to TMJ pain and dysfunction, with an additional 23.3% also experiencing symptoms from their third molars. Similarly, in a retrospective analysis, Kim et al. examined pathological changes associated with impacted mandibular third molars and nearby teeth across different age groups within a Korean population.<sup>16</sup>

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## Impact of Impaction Type

The type of impaction in wisdom teeth significantly influences the prevalence of temporomandibular joint (TMJ) disorders, with each type displaying a unique impact on TMJ health. Horizontal impaction, where the tooth is angled horizontally and exerts pressure against adjacent teeth, has been associated with the highest prevalence of TMJ disorders, affecting 63.8% of patients according to one study. This high incidence may stem from the substantial lateral force exerted by horizontally impacted teeth, which can misalign the bite, alter jaw movement, and place undue stress on the TMJ. Distoangular and mesioangular impactions—characterized by the tooth angling distally or mesially relative to the adjacent tooth—are also linked to TMJ issues, albeit at slightly lower rates, with a prevalence of 42.5% and 46.3%, respectively. These angulations likely create an uneven distribution of pressure within the jaw, potentially disrupting normal joint function. Vertical impaction, where the tooth remains upright but fails to erupt properly, shows a lower association with TMJ disorders, with a prevalence of around 30%. This relatively lower impact on TMJ health could be due to the more balanced pressure distribution in vertical impactions, which are less likely to interfere significantly with jaw alignment and movement compared to horizontal or angular impactions. Overall, the type of impaction plays a crucial role in the development of TMJ disorders, with horizontal impaction posing the greatest risk, followed by distoangular and mesioangular impactions, and vertical impaction presenting a comparatively reduced association.<sup>3,4,16,17</sup>

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## Treatment

Treatment involves several phases, each focusing on specific aspects of symptom management and structural correction. In Phase I, patients receive counseling aimed at modifying behaviors and practices that could aggravate symptoms. Key recommendations include avoiding excessive mouth opening when eating or yawning, refraining from chewing hard foods or candy, applying warm compresses to the face, consuming a soft diet, and maintaining proper posture to prevent prolonged bending. Patients are also advised to hold their phones correctly, establish regular sleep patterns to alleviate anxiety and stress, chew evenly on both sides of the jaw, and take NSAIDs as needed for pain relief. Phase II involves the extraction of maxillary third molars that are distally tilted or have erupted above their normal position. Phase III introduces the use of intraoral appliances to provide additional structural support and relief. Finally, Phase IV addresses more extensive restorative needs, including replacing missing teeth, restoring partially edentulous areas, extracting impacted teeth, correcting misalignments through orthodontics, and restoring vertical dimension loss, ultimately aiming for functional and aesthetic rehabilitation.<sup>18,19,20</sup>

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## Conclusion

In conclusion, impacted third molars can significantly influence the development and exacerbation of temporomandibular joint (TMJ) disorders through multiple mechanisms, including crowding, pain referral, occlusal interference, and infection-induced inflammation. Additionally, surgical removal of these teeth may further impact TMJ health, particularly in cases where prolonged mouth opening or postoperative shifts in jaw alignment contribute to muscle tension. Recognizing these potential impacts is essential for clinicians to make informed decisions regarding the management of impacted third molars, particularly in patients with existing or heightened risk for TMJ disorders. A comprehensive approach to treatment planning and post-operative care can help mitigate TMJ complications, improving patient outcomes and overall quality of life.

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