

REVIEW ARTICLE

Clinical implications of oral piercing: A literature review of local and systemic complications

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Abstract

Oral piercings have become increasingly popular in recent decades, particularly among adolescents and young adults, representing a widespread form of body modification. Although often considered an aesthetic practice, primarily the insertion of jewelry into the oral cavity may be associated with several local and systemic complications relevant to dental professionals. This literature review aimed to evaluate and synthesize the available scientific evidence regarding the clinical implications of oral piercings and their associated complications. A literature search of major electronic databases was conducted to identify clinical investigations, observational studies, case series, and case reports reporting local or systemic complications associated with oral and perioral piercings. Due to substantial heterogeneity in study design, patient populations, types of piercings, and reported outcomes, a qualitative synthesis of the evidence was performed. The literature consistently reports a wide range of complications. Frequently described local effects include gingival recession, enamel wear, tooth fractures, mucosal trauma, periodontal changes, bleeding, swelling, and localized infections. Systemic complications, although less common, include bacteremia, infective endocarditis, allergic reactions, and potential transmission of infectious diseases, particularly in susceptible patients. These findings highlight the potential risks associated with oral piercings and underscore the importance of awareness among dental practitioners. In conclusion, oral piercings may be associated with an increased risk for both oral and systemic health, and dentists play a crucial role in prevention, early diagnosis, patient education, and management of related complications.

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1. Introduction

The practice of piercing involves inserting jewelry into specific anatomical sites using a needle-puncture procedure, typically performed without anesthesia.¹ Historically

associated with tribal, religious, and symbolic rituals, oral and perioral piercings have progressively transitioned into a mainstream phenomenon in contemporary industrialized societies, particularly among adolescents and young adults.^{2,3} This growing diffusion reflects broader sociocultural dynamics, including identity expression, aesthetic trends, and the normalization of body modification practices.³⁻⁵

Among anatomical locations, the oral cavity is among the most clinically relevant due to its complexity and functional significance. The tongue and lips are the most frequently involved areas, followed by the cheeks, lingual frenulum, and, less commonly, the uvula. Common types of jewelry include barbells, labrets, and captive bead rings, typically manufactured from materials such as titanium, surgical stainless steel, or high-carat gold to ensure biocompatibility.^{2,6} Despite these precautions, the introduction of a foreign body into the oral environment poses significant biological challenges.

The oral cavity is characterized by a highly vascularized tissue network, continuous mechanical stress related to mastication and phonation, and a complex microbiota.^{7,8} These factors contribute to an increased susceptibility to both acute and chronic complications. Infections are among the most frequently reported adverse events and may occur during the piercing procedure (particularly in the absence of adequate sterilization protocols) or as a consequence of long-term jewelry retention.^{2,9} In addition to infectious complications, a wide range of local alterations has been documented, including mucosal trauma, edema, pain, scar formation, and granulomatous reactions. Furthermore, the mechanical interaction between jewelry and oral structures may result in dental fractures, enamel wear, gingival recession, and periodontal attachment loss.⁹⁻¹²

Importantly, the potential consequences of oral piercings extend beyond local tissues. Several authors have highlighted the risk of systemic complications, including bacteremia, infective endocarditis, and transmission of infectious diseases such as hepatitis B and C, herpes simplex virus, and, potentially, human immunodeficiency virus (HIV), particularly when aseptic conditions are inadequate.^{9,13-15} Although these events are relatively rare, they may have severe or even life-threatening implications, especially in medically compromised patients.

Another critical issue emerging from the literature is limited patient awareness of the risks associated with oral piercings. Many individuals undergo the procedure without prior dental consultation and often fail to adopt appropriate oral hygiene practices or follow preventive recommendations.^{2,16} This gap in patient education highlights the need for increased involvement of oral

health professionals.

Dentists and dental hygienists play a pivotal role in the prevention, early detection, and management of complications related to oral piercings. Their responsibilities include patient education, risk assessment, reinforcement of oral hygiene measures, and regular clinical monitoring. Moreover, they are often required to manage both acute and chronic sequelae associated with these devices, making their role essential in preserving oral and systemic health outcomes.^{2,9}

Despite the growing number of publications on oral and perioral piercings, the available evidence remains heterogeneous in terms of study design, reported outcomes, piercing location, follow-up duration, and clinical relevance. Therefore, a focused clinical synthesis may help clarify the range of complications associated with these practices and their implications for dental prevention, counseling, and management.

Unlike previous reviews, which focused mainly on isolated complications or specific outcomes, this review aims to provide a comprehensive clinical overview of local and systemic complications associated with oral piercings, with particular attention to their implications for dental practitioners and preventive strategies.

2. Materials and methods

2.1. Methods summary

This study was designed as a narrative literature review with a structured search strategy to summarize available evidence on local and systemic complications associated with oral and perioral piercings and to discuss their clinical implications for dental practice. Due to the heterogeneity of the available evidence, the review was not conducted as a formal systematic review, and no meta-analysis was performed. A literature search was performed in PubMed and Scopus for publications from 1988 to 2026. Due to the heterogeneity of study designs, populations, outcomes, and reported complications, a qualitative synthesis was performed rather than a meta-analysis.

2.2. Search strategy

A literature search was conducted using major electronic databases, including PubMed, Scopus, and Web of Science, to identify studies investigating oral and perioral piercings and their associated complications. The search included combinations of keywords such as “oral piercing,” “tongue piercing,” “lip piercing,” “oral complications,” “periodontal complications,” and “systemic complications.”

2.3. Study selection

Titles and abstracts identified through the electronic

search were screened for relevance. Full texts of potentially eligible studies were subsequently evaluated according to the inclusion criteria. Studies considered relevant to the objectives of the review were included in the qualitative synthesis.

2.4. Data extraction

Data extracted from the included studies comprised study design, type of oral piercing, reported local and systemic complications, clinical findings, and main conclusions. The extracted information was qualitatively synthesized due to the heterogeneity of the available evidence. Data were extracted using a predefined extraction form including: author, year of publication, country, study design, sample characteristics, piercing location, jewelry type, reported local complications, reported systemic complications, microbiological findings, management strategies, and main conclusions.

2.5. Aim and hypotheses

The aim of this literature review is to identify and synthesize available evidence regarding oral piercings, focusing specifically on the local and systemic complications associated with their presence and their implications for oral health and clinical dental management.

The review is based on the following hypotheses:

- Local complications, such as gingival recession, tooth fractures, mucosal trauma, and periodontal issues, are more prevalent in individuals with oral piercings.
- Systemic complications, including bacteremia, infective endocarditis, and the transmission of infectious diseases, may occur in susceptible populations.
- Early identification, patient education, and appropriate clinical management can reduce the severity and incidence of these complications.
- Awareness of potential risks and the implementation of preventive strategies in dental practice can improve overall oral health outcomes and patient safety.

2.6. PICO and pre-specified outcomes

The review question was structured according to the PICO framework to define the target population, exposure, comparators, and outcomes of interest regarding oral piercings and their associated complications.

- P (Population): Individuals of any age with oral piercings (e.g., tongue, lip, labret, frenulum). Studies focusing on non-oral body piercings or unrelated populations were excluded.

- I (Interventions/exposure): Presence of oral piercings, including all types and locations, with an analysis of associated complications and management strategies reported in the literature.
- C (Comparators): Where available, individuals without oral piercings or baseline oral conditions before piercing. In studies without comparators (e.g., case series or case reports), descriptive data were included.
- O (Outcomes): (i) Primary outcomes: Local oral complications (gingival recession, tooth fractures, periodontal damage, mucosal trauma, bleeding, swelling, and infection) and systemic complications (bacteremia, infective endocarditis, systemic infections, and allergic reactions). (ii) Secondary outcomes: Clinical management strategies and their effectiveness, patient education and preventive measures, and treatment acceptability/adherence.

2.7. Eligibility criteria

Eligibility criteria were established a priori to ensure the inclusion of studies relevant to oral piercings, their associated complications, and the role of oral healthcare professionals in prevention and management.

Inclusion criteria: This review analyzes articles documenting oral piercing practices, their potential clinical implications, and the specific roles of dentists and dental hygienists. Original articles, systematic reviews, longitudinal prospective and retrospective studies, and case reports were included. Only articles published between 1988 and 2026 were considered. Furthermore, guidelines or consensus statements (e.g., Dystrophic Epidermolysis Bullosa Research Association International) were included (Table 1).

Exclusion criteria: Studies were excluded if they did not provide an abstract or full text sufficient for data extraction, or did not specifically address oral or perioral piercings. Articles focusing exclusively on non-oral body piercings, unrelated dental or medical conditions, or complications not associated with oral jewelry were also excluded. Editorials, commentaries, letters to the editor, conference abstracts without sufficient clinical data, and duplicate publications were not considered eligible for inclusion.

Study designs: Randomized and non-randomized clinical studies, cohort, case-control, cross-sectional studies, case series, and case reports. Guidelines and position statements were used narratively.

The search strategy utilized a combination of Medical Subject Headings (MeSH) and free-text keywords. In PubMed, the following Boolean string was applied: ("Oral

Piercing" OR "Tongue Piercing" OR "Lip Piercing") AND ("Oral Health" OR "Periodontal Diseases" OR "Gingival Recession" OR "Tooth Fractures" OR "Dental Enamel" OR "bacteremia"). In Scopus, the equivalent search was: TITLE-ABS-KEY (("oral piercing" OR "tongue piercing" OR "lip piercing" OR "intraoral piercing") AND ("oral health" OR "periodontal disease*" OR periodontitis OR "gingival recession" OR "tooth fracture*" OR "enamel wear" OR bacteremia)).

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Original articles, systematic reviews, both prospective and retrospective longitudinal studies, and case reports.	Articles focusing exclusively on non-oral body piercings, unrelated dental or medical conditions, or complications not associated with oral jewelry were also excluded.
Studies focusing on local and systemic complications of oral and perioral piercings.	Studies without an abstract.
Studies investigating patient awareness and the role of dental professionals.	Editorials and commentaries.

2.8. Search strategy

The search was conducted on PubMed using a controlled vocabulary (MeSH terms) and free-text keywords. The search strategy combined terms such as: oral piercing, piercing and complications, and piercing and hygiene. Boolean operators (AND/OR) were used to ensure comprehensive coverage.

Regarding the selection process, duplicates were removed first, and two reviewers independently screened titles and abstracts; discrepancies were resolved through collective discussion. The search returned 83 results in PubMed and 126 in Scopus. A total of 60 articles were included in the review; the selection process is summarized in the Preferred Reporting Items for Systematic reviews and Meta-Analyses flow diagram (Figure 1).

2.9. Data selection

Two independent reviewers selected studies based on predefined inclusion and exclusion criteria, with disagreements resolved by consensus. The extracted data (including subject, authors, title, year, design, and results) are summarized in Table 2.

2.10. Statistical analysis

Because of the heterogeneous nature of the included evidence, which comprised observational studies, case

series, case reports, reviews, and policy documents, a formal risk of bias assessment was not performed. This aspect was considered when interpreting the strength of the conclusions.

3. Results

The selection of the anatomical site for piercing placement is a critical factor that determines the nature of the tissue insult and the potential for long-term clinical complications.

The primary anatomical sites for oral piercing include the tongue, lips, cheeks, lingual frenum, and, less commonly, the uvula. The most frequently used jewelry types in the perioral area are the captive bead ring, labret, and barbell.^{2,9}

- Captive bead ring: This consists of a metal ring that is closed by a tension-held or screwed metal sphere. It is often the preferred choice for initial labial piercings due to its ease of cleaning and minimal interference with initial postoperative edema.^{2,9}
- Labret: A labret consists of a straight metal bar with a flat decorative disc at one end and a removable closure (usually a sphere) at the other. It is widely employed in the perioral area and occasionally in the lingual dorsal-ventral midline.^{2,9}
- Barbell: Similar to the labret, the barbell is a straight rod; however, it features spherical ends at both extremities (one fixed and one removable). It is the standard choice for tongue piercings.

3.1. Distribution and specific anatomical considerations

The tongue and lips remain the most prevalent sites for oral piercings, followed by the cheeks, lingual frenulum, and uvula.^{10,11}

- Lip piercings: These are generally placed on the lower lip, frequently near the commissures (corners of the mouth). However, they can be positioned anywhere along the vermillion border.
- Tongue piercings:
 - (i) Dorsoventral: The most common and safest method, where the jewelry is inserted from the dorsal to the ventral surface along the midline to avoid major blood vessels and the deep lingual artery (Figures 2–4).
 - (ii) Dorsolateral: This involves a horizontal insertion through the width of the tongue. This procedure is widely considered unsafe and is avoided by most professional piercers due to the high vascularity and risk of severe hemorrhage.

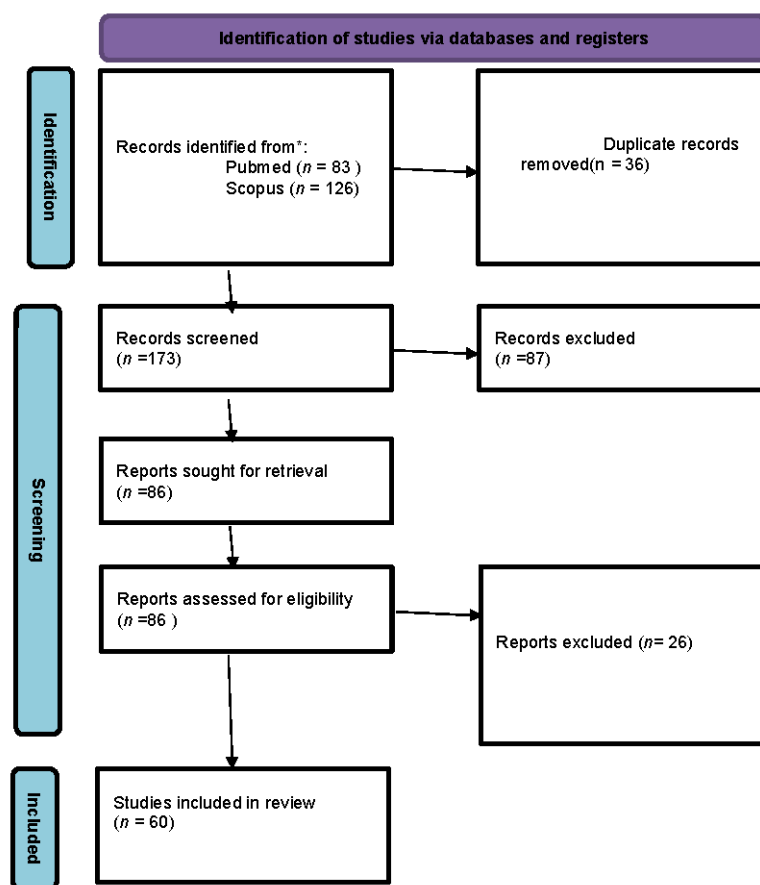


Figure 1. Flow diagram illustrating the study selection process for the literature review

(iii) Frenulum linguae: A piercing through the fold of mucous membrane under the tongue. While the tongue typically heals within 4 to 6 weeks due to high vascularity and constant movement, the frenulum requires specific care to avoid recession or trauma to the sublingual caruncles.^{11,12}

- Cheek piercings: Typically placed at the site of natural dimples. Clinical protocol dictates placement anterior to the first molar to minimize the risk of damaging the Stensen's duct (parotid duct), which opens near the second upper molar.
- Uvula piercings: These remain rare due to the technical difficulty of the procedure, the high risk of triggering a gag reflex, and the potential for accidental ingestion or aspiration.¹²

According to Boardman *et al.*¹¹, although tongue piercings are more common, cheek piercings are statistically associated with a higher frequency of localized complications compared to other oral site.

The severity of complications is influenced not only by the anatomical site but also by the jewelry's biomaterial properties (Table 3). Based on the 60 articles analyzed in this review, three main materials predominate:

- Titanium is generally considered highly biocompatible and is commonly preferred because of its corrosion resistance and lower potential for nickel release compared to several stainless-steel alloys.
- Surgical stainless steel (316L): While widely used, it is susceptible to galvanic micro-corrosion in the acidic and saline environment of the oral cavity, which may exacerbate localized inflammatory responses.
- Polymer-based materials, such as acrylic or polytetrafluoroethylene, may reduce hard-tissue trauma because of their lower rigidity; however, surface characteristics and hygiene maintenance may influence bacterial retention.

A recent cross-sectional survey from Riyadh confirmed that oral and perioral piercings are most frequently located on the lips and tongue and are mainly observed



Figure 2. Extraoral and intraoral photographs of a patient with a tongue piercing



Figure 3. Panoramic radiograph of a patient with a tongue piercing

Table 2. Most common anatomical site for piercings, common jewelry, healing period, and primary clinical risk

Anatomical site	Common jewelry	Healing period	Primary clinical risks
Tongue (midline)	Barbell	4–6 weeks	Severe edema, tooth fractures, lingual gingival recession, and speech impediment.
Lip (vermillion)	Labret/ring	6–8 weeks	Vestibular recession, mucosal stripping, and increased peri-mural plaque accumulation.
Cheek	Barbell	8–12 weeks	Parotid duct injury, salivary fistulas, and high frequency of chronic infection.
Lingual frenum	Small ring/ barbell	4–6 weeks	Frenulum laceration, jewelry instability, and sublingual caruncle trauma.
Uvula	Small ring	Variable	Aspiration risk, chronic gag reflex, dysphagia, and difficult secondary healing.

in teenagers and young adults, with a markedly higher prevalence among women than men.¹³

Recent scoping and systematic reviews further indicate that, although the overall prevalence of oral piercing can be relatively low in some student populations, its use in adolescents and young adults is consistently associated with a wide spectrum of local and systemic complications, underlining its clinical and public-health relevance.^{17,20}

Oral and perioral piercings are linked to a broad spectrum of complications that can be classified as: (i) complications occurring during or immediately after the piercing procedure; and (ii) complications related to the prolonged presence of the jewelry.¹³

3.2.1. Complications during and shortly after placement

Local bleeding is a common occurrence during piercing. In highly vascular areas like the tongue, this can escalate to severe hemorrhage. It is therefore crucial that procedures be performed by trained personnel, using aseptic techniques and careful anatomical evaluation. Although not the most common complication, bleeding poses a significant risk to medically compromised patients, necessitating a thorough pre-procedure medical history.



Figure 4. Lateral radiograph of a patient with a tongue piercing

Table 3. Complications of oral piercing

Category	Type of study	Main findings/complications	Clinical takeaway
Local complications ^{1,2,6-8,11-14,17-22}	Literature review, case reports, clinical studies	Swelling, edema, airway obstruction, pain, prolonged bleeding, infections, speech interference, jewelry aspiration/ingestion, mucosal trauma, ulcers, fibrosis, and ranula	Frequent and often immediate complications, mainly related to mechanical trauma and poor hygiene
Systemic complications ²³⁻²⁸	Case reports, reviews	Infective endocarditis, bacteremia, hepatitis transmission (HBV/HCV), fulminant infections, metal toxicity/allergic reactions (Ni, Co)	Rare but potentially life-threatening; relevant for medically compromised patients
Periodontal effects ²⁹⁻⁴⁶	Cross-sectional, clinical reviews	Gingival recession (especially lip piercing), attachment loss, periodontal pockets, mucogingival defects, localized periodontitis	One of the most significant long-term consequences, often underestimated
Dental hard tissue damage ⁴⁷⁻⁵²	Case reports, observational studies	Enamel chipping, tooth fractures, abrasion, enamel wear, diastema formation (tongue bar), root resorption	Direct mechanical damage due to repeated contact with jewelry
Microbiological findings ⁵³⁻⁷⁰	Microbiological and laboratory studies	Increased plaque accumulation, biofilm formation on jewelry, colonization by periodontal pathogens (e.g., <i>Porphyromonas gingivalis</i>), "Red Complex" bacteria, reduced effectiveness of antibacterial rinses, smoking synergy	Piercings act as reservoirs for pathogens, increasing periodontal risk
Reviews and policy-related evidence ¹⁷⁻²⁰	Policy statements, reviews	Strong discouragement of oral piercings, need for informed consent, importance of patient education, early removal if complications occur, regular dental monitoring	Emphasis on prevention, patient awareness, and professional counselling

Abbreviations: Co: Cobalt; HBV: Hepatitis B virus; HCV: Hepatitis C virus; Ni: Nickel.

Acute infection is a major concern because oral microbiota can enter the puncture wound and disseminate via the bloodstream. Bacteria from the tongue and surrounding mucosa may seed distant sites, potentially leading to systemic infections such as bacterial endocarditis in susceptible patients. Additional risk factors include manipulation of the site with unwashed hands, consumption of contaminated food or beverages, and contact with non-sterile instruments. National and international health agencies have identified unregulated piercing rooms and inadequate sterilization procedures as possible vectors for transmission of blood-borne pathogens such as hepatitis B and C, tetanus and tuberculosis, as well as for bacterial endocarditis in predisposed individuals.¹⁶

The tongue is richly innervated by sensory and motor fibers, so inadvertent trauma to nerves during piercing can result in transient or permanent sensory deficits, motor disturbances, or alterations in taste perception. These neurological complications are more commonly reported with dorsolateral than with midline dorso-ventral tongue piercings due to the proximity of larger nerve bundles. Acute swelling and edema of the tongue or floor of the mouth are frequently described in the first hours and days after placement and, in severe cases, may compromise the airway. Life-threatening events such as Ludwig's angina, severe edema with airway obstruction, and endocarditis have been reported in association with oral piercings.

Systemic infectious complications related to poor asepsis include hepatitis B and C, HIV, herpes simplex virus infection, Epstein-Barr virus, syphilis, candidiasis, tetanus, tuberculosis, and bacterial endocarditis. Although direct transmission of HIV during piercing has not been conclusively demonstrated, the theoretical risk cannot be excluded, particularly when non-sterile instruments are used. A fatal case of fulminant herpes simplex hepatitis following tongue piercing in an otherwise immunocompetent adult has also been described.

The most frequent reasons for emergency care were bleeding, edema, infection, pain, swallowing difficulties, and complications related to jewelry aspiration or ingestion.

3.2.2. Complications associated with the long-term presence of the jewelry

Most long-term complications are local and involve soft tissues, periodontium, or teeth. At the mucosal level, chronic mechanical irritation by the jewelry often causes erythema, edema, and persistent localized inflammation. These changes can persist for weeks or months and may evolve into granulomatous reactions, fibrous hyperplasia, mucosal atrophy, or the development of lesions, such as a sublingual ranula, that may require surgical treatment. Cheek and lip jewelry can also lead to hypertrophic or keloid scarring, with the risk influenced by systemic factors, genetic predisposition, and drugs.

The presence of a foreign body and the difficulty maintaining adequate hygiene around the piercing favor the accumulation of plaque and calculus, halitosis, painful inflammation, and localized infections. Several studies have described subcutaneous infections involving organisms such as *Staphylococcus aureus*, group A *streptococci*, and *Pseudomonas aeruginosa*, particularly around tongue piercings; due to the proximity of regional lymph node chains and fascial spaces, these infections may spread and lead to severe complications, including airway obstruction, bacteremia, endocarditis, and sepsis. Ludwig's angina is a well-documented, potentially life-threatening sequela characterized by rapidly progressive cellulitis of the floor of the mouth, tongue swelling, neck pain, and respiratory distress.

In addition to infectious and inflammatory events, oral piercings may interfere with mastication, swallowing, and phonation, particularly when large barbells are present on the tongue.⁷¹⁻⁷³ Continuous friction between the jewelry and lingual papillae can result in papillary atrophy and reduced taste perception. Increased salivary flow is another common finding, reported in up to 63% of subjects in some studies and attributed to chronic stimulation by the foreign body. Contact hypersensitivity and even anaphylactic

reactions have been reported to nickel, chromium, and cobalt in metallic jewelry, with concern that oral piercings may contribute to sensitization in young patients who also wear nickel-containing orthodontic appliances.^{16,17}

From a periodontal standpoint, gingival recession and traumatic periodontal lesions are very common. Lip piercings, especially with a metal disc on the inner aspect of the lower lip, are strongly associated with buccal recessions of the mandibular incisors, often without initial pocket-depth increase but with clear marginal tissue loss. Tongue piercings, in contrast, have been linked not only to recession on lingual aspects of mandibular anterior teeth but also to increased probing depths and clinical attachment loss. Several authors have shown that recession severity is related to jewelry length and diameter, frequency of contact with teeth and soft tissues, and duration of wear. A systematic review and meta-analysis reported that about one-third of subjects with piercings exhibit gingival recession and that the odds of recession are markedly higher in pierced versus non-pierced individuals. Observational studies included in American Academy of Pediatric Dentistry (AAPD) guidelines found recession in 7-50% of patients with lip piercings and 6-44% of those with tongue piercings.¹⁶⁻¹⁸

Persistent mechanical trauma from the jewelry can also cause localized horizontal bone loss and dehiscences. Dental hard tissues are directly affected by parafunctional habits and inadvertent contact with jewelry during eating, talking, or sleeping. Reported changes include enamel fractures, cracks, chipping, and abrasions, which may progress to dentin exposure, hypersensitivity, and pulpal involvement. Fractured teeth are a particularly common problem among individuals with tongue piercings, with posterior teeth (molars and premolars) most frequently involved. Meta-analytic data suggest that 22-34% of piercing wearers present enamel chipping, wear/abrasion, or frank dental fractures, and that the risk of tooth damage is substantially higher than in non-pierced controls. AAPD data indicate permanent tooth injuries in approximately 26% of patients with lip piercing and 37-46% of those with tongue piercing.^{19,20}

In patients with ceramic restorations, the risk of chipping or fracture is increased when metal jewelry is present, leading many authors to recommend removal of the piercing or replacement with non-metallic components. Tongue piercings in patients wearing fixed orthodontic appliances, such as rapid maxillary expanders, may aggravate periodontal damage, interfere with oral hygiene, and delay tissue healing following surgical exposure of impacted teeth. There have also been reports of midline diastema formation and dental misalignment

attributed to chronic traumatic contact from tongue piercings. An external physical insult due to a piercing can deviate from normal growth trajectories and correct root formation, leading to root dilaceration. Furthermore, an intra-oral jewelry piece exerts continuous pressure (often involuntary, during speech or mastication) that mimics orthodontic forces.^{50,51}

Microbiological studies have demonstrated that tongue piercings can harbor high levels of anaerobic periodontal pathogens, including *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Tannerella forsythia*, and *Treponema denticola*, with patterns similar to those found in sub-gingival plaque.^{58,59} Poor oral hygiene, larger jewelry size, and smoking have been associated with worse plaque indices and more pronounced periodontal alterations around teeth adjacent to the piercing. Because the tongue plays a central role in swallowing, speech, occlusal balance, and airway patency, alterations in its morphology, volume, or mobility may have relevant clinical consequences. In patients with tongue piercings, chronic mechanical irritation, edema, or functional interference caused by the jewelry may therefore contribute to disturbances in oral function and, in severe cases, may affect airway-related clinical conditions.^{68,73}

4. Discussion

Several national and international dental associations, including the American Dental Association and the AAPD, explicitly discourage intraoral and perioral piercings because of the broad range of complications consistently associated with these practices.¹⁶⁻²¹ Nevertheless, oral and perioral jewelry remains popular among adolescents and young adults as a form of self-expression and fashion, and many individuals undergo these procedures without prior dental consultation or adequate information about potential risks.

The findings of this literature review support an association between oral and perioral piercings and a broad range of local complications, while systemic complications appear less frequent but potentially severe in susceptible individuals.¹⁶ However, the available evidence is largely derived from observational studies, case reports, and case series. Therefore, although associations are consistently reported, a direct causal relationship between oral piercings and many of the described complications cannot be definitively established. Although most complications described in the literature are local and generally mild, the potential for severe systemic adverse events underscores the importance of careful patient selection, preventive counseling, and professional monitoring.

From a periodontal perspective, recent meta-analyses have quantified the magnitude of tissue damage associated with oral piercings.¹⁴ Periodontal complications, particularly gingival recession and attachment loss, were consistently reported across the included studies and appear to be associated with chronic mechanical trauma and inadequate oral hygiene. From a clinical perspective, these findings underline the importance of regular periodontal monitoring in patients with oral piercings, especially when jewelry is worn for prolonged periods.

Dental hard-tissue damage, including enamel wear, chipping, cracks, and fractures, was another frequently reported finding. These alterations are plausibly related to repeated mechanical contact between jewelry and teeth during speech, mastication, or parafunctional habits. However, the magnitude of this risk may vary according to jewelry material, size, duration of wear, and individual behavioral factors. These findings complement earlier concerns regarding nickel sensitization and support the preference for truly biocompatible materials whenever patients refuse to remove their piercings.

Although microbiological studies suggest that oral jewelry may act as a reservoir for periodontal pathogens, the clinical predictive value of bacterial colonization remains uncertain. At present, no validated microbiological threshold has been demonstrated to accurately predict future periodontal destruction, disease progression, or systemic complications in individuals with oral piercings. These findings should therefore be interpreted as potential biological indicators rather than definitive predictors of disease onset or progression. This suggests that oral jewelry may not only initiate local inflammation but also contribute to the persistence or recurrence of periodontal disease in susceptible patients, especially when oral hygiene is inadequate and smoking is present.

The interpretation of these associations is limited by potential confounding factors. Oral hygiene habits, smoking, socioeconomic status, access to dental care, parafunctional behaviors, baseline periodontal conditions, jewelry material, piercing location, and duration of wear may all influence the occurrence and severity of complications. Most of the included studies did not fully adjust for these variables; therefore, the independent contribution of oral piercing cannot be definitively quantified. Future well-designed prospective studies controlling for these variables are necessary to better determine the independent contribution of oral piercings to oral and systemic health outcomes.

Another recurring theme in recent literature is the limited awareness of risks among both the general population and, in some cases, healthcare providers.¹⁴⁻¹⁹

Earlier studies and our own review have already noted that many individuals undergo piercings without consulting a dentist or verifying the piercer's qualifications. The updated AAPD policy confirms that unregulated piercing and poor infection-control procedures are recognized by the U.S. National Institutes of Health as potential sources of transmission for hepatitis, tetanus, tuberculosis, and bacterial endocarditis.

Another relevant finding from the literature is limited awareness of risks associated with oral piercings among patients and, in some cases, healthcare providers. This highlights the need for improved educational and preventive strategies. In line with current policy statements, clinicians should adopt a precautionary approach. Patients should be informed that intraoral and perioral piercings may be associated with local and systemic complications, and dental professionals should provide individualized counseling, particularly for medically susceptible individuals.

For individuals who already wear piercings, however, dentists and dental hygienists have an important responsibility in minimizing risk. This includes: (i) providing detailed information about possible local and systemic complications; (ii) assessing medical history to identify patients at increased risk (e.g. those with congenital or acquired heart disease, immunosuppression, bleeding disorders or uncontrolled systemic conditions); (iii) recommending removal of jewelry before dental, periodontal and surgical procedures to optimize asepsis and avoid radiographic artefacts; and (iv) offering specific instructions for oral hygiene and local care of the piercing site. The available literature does not provide definitive evidence supporting routine removal of oral piercings before all dental procedures. Temporary removal may be considered when jewelry interferes with treatment, compromises radiographic interpretation, causes local trauma, or when patients present medical conditions associated with an increased risk of infection or complications. Therefore, decisions regarding piercing removal should be individualized according to the patient's risk profile and the planned dental procedure. However, temporary removal may be considered in selected cases, particularly when jewelry interferes with treatment, causes local trauma, affects radiographic imaging, or when patients are at increased risk of infection or systemic complications.

Evidence specifically addressing transient bacteremia induced by oral piercings during routine dental procedures, such as periodontal scaling or tooth extraction, remains extremely limited. To date, no prospective clinical studies have directly quantified the incidence or magnitude

of piercing-related transient bacteremia during these procedures. Consequently, current recommendations rely largely on indirect evidence and expert opinion. Therefore, recommendations should be individualized according to the patient's medical risk profile and the type of dental procedure. Preventive strategies should include reinforcement of oral hygiene measures, regular dental follow-up, and behavioral recommendations to reduce mechanical trauma and infectious complications. Regular dental follow-up is essential for early detection of gingival recession, bone loss, caries, fractures, mucosal lesions, or signs of infection, and for implementing timely interventions, including removal of jewelry when necessary.

This review has several limitations. First, the included studies were highly heterogeneous in terms of design, sample size, piercing location, follow-up duration, and outcome definitions. Second, much available data derive from observational studies, case series, or case reports, limiting causal inference. Third, a formal risk-of-bias assessment was not conducted due to the heterogeneity of the evidence base. Fourth, potential confounding factors, such as smoking, oral hygiene, socioeconomic status, baseline periodontal conditions, and access to dental care, were not consistently controlled across studies. Consequently, the overall certainty of evidence supporting several reported associations should be considered low to moderate, and findings should be interpreted with appropriate caution.¹⁻³

Future prospective controlled studies with standardized outcome measures and longer follow-up will be important for refining risk estimates and identifying the most relevant modifiable factors, such as jewelry material, design, location, and duration of wear. Until such data become available, however, the current body of evidence justifies a clear clinical message: clinicians should inform patients about the potential complications associated with oral piercings and provide appropriate preventive and monitoring strategies, and patients who choose to wear them require structured counseling and close professional supervision to mitigate their substantial risk of local and systemic complications. Although evidence remains limited, temporary removal of oral piercings may be advisable before certain dental procedures, particularly in patients at increased risk of infection or trauma.

5. Conclusion

The findings of this literature review suggest that oral and perioral piercings may be associated with a wide range of local complications and, less frequently, systemic adverse events, particularly in susceptible individuals. Although

the available evidence is heterogeneous and largely based on observational studies, case reports, and case series, the consistency of reported findings supports the need for careful clinical attention.

The most frequently described complications involve periodontal tissues, oral mucosa, and dental hard tissues. Gingival recession, periodontal attachment loss, mucosal trauma, enamel wear, tooth chipping, and dental fractures appear to be among the most relevant long-term consequences. These complications are likely influenced by several factors, including piercing location, jewelry material and size, duration of wear, oral hygiene habits, smoking, parafunctional behaviors, and baseline periodontal conditions.

Systemic complications, such as bacteremia, infective endocarditis, allergic reactions, and the potential transmission of infectious diseases, appear to be less common but may have serious clinical implications. However, current evidence primarily supports associations rather than definitive causal relationships, and further prospective studies are required to clarify these links. However, the current evidence does not allow definitive causal conclusions, and these events should be interpreted mainly as possible associations reported in the literature.

Microbiological studies suggest that oral jewelry may act as a reservoir for periodontal pathogens and contribute to local inflammation or the persistence of periodontal disease in susceptible individuals. Nevertheless, the clinical predictive value of bacterial colonization remains uncertain, and further prospective studies are needed to clarify its role in disease onset and progression.

Dental professionals play an important role in prevention, early diagnosis, and patient education. Clinicians should inform patients about the potential risks associated with oral and perioral piercings, assess individual risk factors, reinforce oral hygiene measures, and provide regular periodontal and dental monitoring. Temporary or permanent removal of jewelry may be considered when clinically indicated, particularly in cases of local trauma, interference with dental procedures, radiographic artifacts, or increased medical risk.

In conclusion, oral and perioral piercings should be approached with caution in dental practice. While the current certainty of evidence remains limited, the available literature supports a precautionary clinical approach, including patient counseling, risk assessment, preventive strategies, and close professional follow-up to reduce potential oral and systemic complications.

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Conflict of interest

The authors declare no conflicts of interest.

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Ethics approval and consent to participate

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Further disclosure

During the preparation of this manuscript/study, the authors used AI for proofreading purposes to check the text and tables for errors. The authors reviewed and edited the results and take full responsibility for the content of this publication.

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