

## Complications of Tongue Piercing: A Review of the Literature and Three Case Reports

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### Abstract

**Aim:** The aims of this review of the literature are to offer further insights into possible problems related to tongue piercing and present three case reports showing undesired effects of tongue piercing.

**Background:** From a dental perspective, oral piercings and especially tongue piercings are not a harmless fashion trend since they can be associated with local and systemic risks and complications. A search of the literature was conducted to investigate the documentation of health risks associated with tongue piercing using the MEDLINE database as well as the German literature.

**Review Results:** The literature contains numerous case reports, a limited number of studies, and a review describing a wide variety of complications, especially in patients who have undergone tongue piercing. In the majority of cases, the piercing of the tongue is performed in the midline. Piercings are made of different materials, usually metal or synthetic materials. Complications during piercing, immediately following piercing, as well as long term were found.

**Conclusions:** The three cases presented here demonstrate some of those adverse effects. The most commonly described oral complication is the damage of teeth and the periodontium caused by tongue piercings. Tongue piercing is a personal



decision, but it is important that patients are fully aware of possible oral health hazards.

**Clinical Significance:** Patients need better information on the potential complications associated with tongue piercing. Dental practitioners should educate patients about potential side effects and possible oral, dental, and systemic complications.

**Keywords:** Tongue piercing, oral complications, oral health hazards

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## Introduction

Permanent body art, such as tattooing and piercing, has been practiced for centuries by many ethnic groups for religious, ritual, and other purposes.<sup>1</sup> In Western societies, piercing is becoming increasingly popular, although only a few years ago it was still associated with a rather eccentric lifestyle. Body piercing today enjoys a widespread popularity among young people in Europe and North America, where it is carried out for body adornment.<sup>1</sup> Piercing means the perforation of the skin and underlying tissue, usually for the permanent insertion of jewelry. Among the most common places to be pierced are the navel, the nipples, and, in particular, the face.<sup>2</sup> Although the ear continues to be the most popular site for piercing,<sup>3</sup> the orofacial area, including the lips, labiomental groove, cheeks, nose, eyebrows, and especially the tongue, is becoming increasingly popular.<sup>2</sup> Other oral or perioral piercing sites include the upper frenulum and even the uvula.<sup>4</sup> Today dental practitioners are encountering a growing number of patients with oral piercings.

From a medical perspective, the use of body jewelry is not a harmless fashion trend since it can produce undesired local and general effects. With the increasing popularity of oral piercings, dental practitioners are being confronted with many complications and dental implications associated with this practice. The literature on the medical aspects mainly consists of case reports, a limited number of studies with only a few patients, and a review.<sup>5</sup> Peticolas et al.<sup>4</sup> distinguish between complications during piercing, complications immediately following piercing, and long-term complications.

Many authors believe dental professionals will be seeing more patients with oral piercings and therefore should be familiar with potential complications and risks.<sup>5</sup> This review of the literature and three case reports provide further insight into the possible complications and side effects of tongue piercing.

## Review of the Literature

Dental professionals are seeing an increasing number of patients with oral piercings and as a result they should be able to inform their patients about possible risks and complications associated with such piercings.

### Search Strategy

The MEDLINE database was searched using PubMed to identify articles containing the keywords “tongue piercing AND complication.” German articles published in scientific journals were an additional source of information.

### Types and Location of Tongue Piercings

There are different types of oral piercings, with tongue piercing being the most prevalent form.<sup>4-11</sup> Rings, barbells, or studs of varying length and thickness are inserted through the tongue, usually in the midline but also laterally to the midline (Figures 1 and 2).

Barbells are the most popular jewelry placed in the tongue after the piercing is performed using a



**Figure 1.** Dorsoventral placement of a tongue piercing.



**Figure 2.** Two dorsoventral tongue piercings.

hollow needle.<sup>2,4</sup> Depending on the anatomical variation, a barbell up to 50 mm long is inserted into the tongue after the piercing procedure. It consists of a stem of varying length with a ball-shaped tip at each end. Labrets or studs with a flat inside surface are frequently used for piercings of the labiomental groove or the cheek.

Swelling of the tongue occurs in the majority of cases and healing time can range between three and five weeks.<sup>6</sup> Once healing has been achieved and the edematous swelling has subsided, the barbell is usually removed and replaced by a shorter one.<sup>8</sup> Peticolas et al.<sup>4</sup> describe two types of tongue piercing: the more common dorsoventral and the dorsolateral piercing. In dorsoventral piercing, the jewelry is inserted from the dorsal to the ventral surface of the tongue. This piercing is usually located in the midline of the tongue and immediately anterior to the lingual frenulum. In dorsolateral piercing, the jewelry is inserted at the lateral borders of the tongue. This is not a harmless procedure since the region of the lateral tongue is highly vascularized and innervated. Boardman and Smith examined approximately 50 patients with tongue piercings, most of them wearing the jewelry in the anterior midline of the tongue.<sup>6</sup>

### Tongue Piercing Materials

A wide variety of different substances or materials are used for making piercing jewelry including surgical stainless steel, cobalt-chromium alloys, silver and gold alloys, platinum alloys, titanium, titanium alloys, and niobium. Recently, synthetic materials such as PMMA (polymethyl methacrylate) and PTFE (polytetrafluorethylene) also have been used. Currently, the most commonly used oral piercings are made of surgical steel, niobium, and titanium. Modern piercing ornaments, however, also include objects that are handmade of natural materials such as horn, bone, ivory, wood, or stone or industrial materials such as aluminum, brass, and copper wire.

### Complications of Tongue Piercing

In 1994, Scully and Chen were the first to describe complications directly associated with a tongue piercing.<sup>8</sup> A wide variety of case reports describing oral complications of tongue piercing have since been published.<sup>6,11-26</sup> Moreover, the

literature offers just a limited number of studies with only a few patients and a review.<sup>5,10,27-31</sup>

A systematic classification of the side effects of tongue piercings reported in the literature provides for three types of complications that are distinguished as follows:<sup>4</sup>

- A. Complications during piercing (complications during the initial procedure)
- B. Complications immediately following piercing (primary postoperative complications)
- C. Long-term complications (secondary postoperative complications).<sup>4</sup>

**Complications during piercing** include all problems that occur during the piercing procedure such as vascular injuries and bleeding or nerve damage, paraesthesia, and localized infection.<sup>4,18</sup> Hardee et al.<sup>19</sup> described a case of a patient who collapsed in hypotensive shock secondary to profuse bleeding after tongue piercing. Moreover, the piercing procedure is associated with the risk of transmission of infectious diseases and infection with blood-borne viruses such as HIV; hepatitis B, C, and D; and papilloma virus, or bacteria such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, or *Clostridium tetani*. In these cases, a systemic infection can result from a localized infection.<sup>18,27</sup>

**Complications immediately following piercing** are all primary postoperative complications. Immediate post-piercing symptoms are usually wound pain and swelling of the tongue and sometimes secondary bleeding and general wound healing problems. Table 1 shows the most common primary postoperative complications of tongue piercing.

Since a foreign body interferes with the movement pattern of the oral soft tissue, it causes increased salivary flow, speech impediment, and trauma to the lingual gingiva. The entire movement pattern of the tongue and oral soft tissue is affected and changed by the piercing. Erythema and hematoma formation are commonly reported as well.<sup>4</sup> More severe complications include airway obstruction secondary to edema of the tongue and diffuse bleeding.<sup>6,24</sup>

A number of authors described life-threatening complications after tongue piercing.<sup>18,19</sup> In 5–20% of all cases, piercing leads to local bacterial

**Table 1. Prevalence of primary postoperative complications of tongue piercing.**

Complications	Author	Prevalence (%)
Pain or tenderness	Stead et al. 2006	71
	De Moor et al. 2005	14
	Kieser et al. 2005	14
Bleeding or hematoma	Levin et al. 2005	46
	Stead et al. 2006	43
	De Moor et al. 2005	6
Swelling and/or infection	Stead et al. 2006	98
	Levin et al. 2005	52
	Kieser et al. 2005	28
	De Moor et al. 2005	24
Speech interference	Stead et al. 2006	51
	De Moor et al. 2005	14

infection.<sup>18,27</sup> The development of acute and chronic infectious diseases is the most dangerous complication of tongue piercing. These systemic infections are rare, but they do occur.<sup>18</sup> In addition, there are an increasing number of reports of bacteremia and endocarditis possibly associated with tongue piercing.<sup>18,32-34</sup>

Despite the lack of definitive evidence for a consistent correlation between piercing and endocarditis in the literature, a correlation may well exist.<sup>33</sup> A number of authors reported cases of Ludwig's angina, which involves an inflammation of the floor of the mouth and is one of the most extreme complications of tongue piercing.<sup>16,22</sup> In recent years, the focus of attention has shifted from the risk of hepatitis B infection in association with tattooing to the risk of transmission of hepatitis C through piercing. Today there is no doubt piercing is associated with a certain risk of acquiring hepatitis. It is possible that HIV, too, can be transmitted through piercing. Although a number of reports failed to provide definitive evidence for the transmission of viruses, they nevertheless were able to show that this is highly likely.<sup>18,35</sup>

**Long-term complications** are all effects that occur long after the piercing procedure. They

involve allergic reactions/complications caused by the presence of a metal foreign body in the tissue and the release of ions. Every fifth piercing, for example, is the cause of inflammation and allergic reactions.<sup>2</sup> Ng et al.<sup>36</sup> were the first to describe a sarcoid-like foreign-body reaction. The most commonly described oral complication is damage to the teeth and periodontium.<sup>2,6,8</sup> Local effects on the teeth are cracks in enamel or tooth fractures resulting from knocking the usually ball-shaped tips of the jewelry against the teeth.<sup>3,6</sup> For this reason, several authors presented clinical cases of fractures involving enamel and dentine.<sup>6,11,12,17,23,25,27,29,37-39</sup> Lingual gingival recessions at the mandibular anterior teeth also have been described.<sup>6,9,21,28,39,40</sup> It appears that the longer and larger the piercing object and the farther anterior it is placed, the more marked the lingual recessions will be.<sup>9</sup> The prevalence of long-term complications of tongue piercings is indicated in Table 2.

Furthermore, there are an increasing number of dental implications caused by oral habits, or a tendency to play with the jewelry. Holding the device between the teeth over an extended period can lead to a widening of the interdental spaces. Tooth migration can result as well.<sup>9</sup> Habitual biting or chewing of the device can lead

**Table 2. Prevalence of long-term complications of tongue piercing.**

Complications	Author	Prevalence (%)
Tooth fracture and wear	Stead et al. 2006	31
	Kieser et al. 2005	28
	De Moor et al. 2000	27
	Campbell et al. 2002	19
	Levin et al. 2005	14
Gingival recession	Kieser et al. 2005	28
	Levin et al. 2005	27
	Campbell et al. 2002	19
	De Moor et al. 2000	40
Ingestion of jewelry	Stead et al. 2006	34

to severe abrasion in otherwise healthy teeth.<sup>6</sup> Moreover, the literature reports isolated cases of aspiration and ingestion of the jewelry or jewelry parts, damage to existing dental work, tissue hyperplasia, scars and keloid formation, soft-tissue lesions, and torn tongue tissue.<sup>4</sup>

### Role of the Dental Professional

The literature reviewed here is strongly suggestive that one function for dental professionals is to counsel a patient seeking advice of the oral health professional prior to being pierced. As a counselor, the clinician should first discourage the patient from having an oral piercing done for the variety of well-known risks and complications associated with this practice. If a patient insists on getting an oral piercing, then the importance of choosing a qualified, trustworthy piercing technician at a certificated piercing studio that uses sterile techniques should be emphasized.

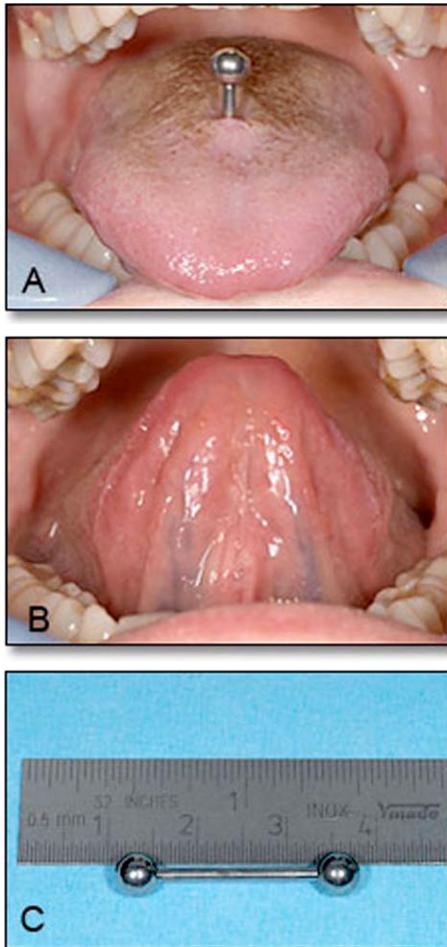
Today manufacturers of piercing jewelry offer devices with ends made of flexible plastic material in order to help reduce the risk of damage to the teeth and periodontium. While this has softened the impact of use of oral jewelry, it has made it more difficult for dental practitioners to advise against tongue piercing based on the potential for some oral complications. However, the potential for bleeding, infection, and speech impairment remains.

## Case Reports

### Case One: Complication following piercing (primary postoperative complication)

A 29-year-old female presented to the outpatient department of the Centre for Dentistry, Oral and Orthodontic Surgery at the Hannover Medical School, in Hannover, Germany, and complained of an inability to move her tongue piercing. The patient had a history of hay fever and hypotension and had smoked a mean number of 15 cigarettes per day for the last 10 years. She was in good general health and in a good nutritional state. Her medical history was otherwise unremarkable. The patient reported her barbell piercing had been inserted seven days earlier in a piercing studio. During the last two days, she had been unable to move or remove the piercing because she could not grasp the ventral ball.

**Intraoral Findings:** The dental examination revealed a number of teeth with carious lesions and chronic generalized gingivitis. Examination of the tongue revealed a piercing that was clearly visible from the dorsal aspect (Figure 3a). Inspection of the sublingual region presented a slight swelling. The ventral ball was not visible (Figure 3b). The patient complained of mild pain on palpation at the inflamed site. There were no other abnormal findings in this area. Therefore, it is extremely likely that the stem of the initially inserted barbell was too short (Figure 3c). For this



**Figure 3.** A. Barbell visible in the midline of the dorsum of the tongue. B. Barbell completely embedded in the ventral surface of the tongue. C. The stem of the barbell was too short (approx. 18 mm).

reason and because of the post-piercing swelling, the ventral ball became embedded in the tongue. Furthermore, the patient had a frenulum piercing in the region of the maxillary central teeth. Particularly remarkable was the presence of demineralized enamel in this area.

**Diagnosis:** A foreign body in the form of piercing jewelry had become embedded in the ventral surface of the tongue and the patient had demineralized enamel on the maxillary central incisors as well as chronic generalized gingivitis.

**Treatment:** At the bottom of the tongue, an incision was made to expose the ball. The piercing was removed and the wound sutured. The patient was prescribed postoperative antibiotics. A couple of days later, gingivitis

therapy (professional tooth cleaning and oral hygiene instruction) as well as restorative treatment were initiated. The demineralized enamel of the upper central incisors was treated with a topical fluoride preparation and the removal of the frenulum piercing was strongly recommended.

### Case Two: Long-term complication (secondary postoperative complication)

A 19-year-old female visited the “German Army” dental office in Regensburg, Germany. Her main complaint was an unusual “excrescence” on her tongue that she had been observing for some days. She was in good general health and in a good nutritional state. Her medical history was otherwise unremarkable and she was a nonsmoker. The patient declared she had a tongue piercing performed four months ago and since that time she had noticed an enlargement near the site of the piercing and been suffering from inflammation in the same region.

**Intraoral findings:** The dental examination presented a caries-free dentition and localized gingivitis. Examination of the tongue revealed a massive tissue proliferation, starting at the piercing in the region of the ventral median of the tongue (Figure 4a). The patient already had removed the tongue piercing due to the proliferation. However, the tissue surrounding the proliferation was heavily inflamed.

**Diagnosis:** The patient was diagnosed as carious free and as having localized gingivitis. Moreover, the tongue piercing had caused a stimulus fibroma in the middle of the tongue.

**Treatment:** The stimulus fibroma was surgically removed and the wound was sutured (Figures 4b and 4c).

### Case Three: Long-term complication (secondary postoperative complication)

A 30-year-old male patient attended the Department of Operative Dentistry, Preventive Dentistry and Periodontology at the University of Goettingen in Goettingen, Germany, for a routine dental check-up. His medical history was unremarkable. He had smoked one pack of cigarettes per day for approximately the last 14 years. He was in good general health and in a good nutritional state.



**Figure 4. A.** Stimulus fibroma in the region of the piercing due to tongue piercing. **B.** Surface of the tongue in the region of the piercing after removal of the stimulus fibroma. **C.** Surgically removed stimulus fibroma (Ø 12 mm).

**Intraoral findings:** The dental examination showed a number of teeth requiring restoration and several carious lesions. Particularly remarkable was a large barbell piercing in the midline of the patient's tongue (Figure 5a). He had been wearing the tongue piercing for seven years. The patient reported wearing the jewelry continuously for the last 12 months.

Advanced periodontal recession was found on the lingual aspect of the mandibular central teeth along with a marked depression the size and



**Figure 5. A.** Large barbell piercing in the midline of the tongue. **B.** Marked lingual gingival recession at the mandibular central teeth. Note the impression left by the ventral ball of the barbell in the adjacent gingiva. **C.** A partial gold crown on the patient's left mandibular first molar. Note the fracture on the mesiolingual cusp resulting from the patient's habit of biting the barbell.

shape of the barbell (Figure 5b). The observed lingual recession was clearly a result of the many years of wearing the tongue piercing.

A partial gold crown on the patient's left mandibular first molar showed a fracture on the mesiolingual cusp. The patient reported that a piece of the gold crown had broken off as a result of his habit of biting the barbell (Figure 5c).

**Diagnosis:** The patient was diagnosed as requiring restorative treatment and as having localized gingivitis. Many years of wearing a tongue piercing had caused gingival recession on the lingual aspect of the mandibular anterior teeth.

**Treatment:** The patient was informed about the risks and complications associated with oral piercings. He was advised to have his tongue piercing removed. In addition, gingivitis therapy and comprehensive restorative treatment were recommended.

## Conclusion

The three cases presented here demonstrate some adverse effects of tongue piercings. The most commonly described oral complication is the damage of teeth and the periodontium. Tongue piercing is a personal decision, but it is important patients are fully aware of possible oral health hazards.

## Clinical Significance

Patients need better information on the potential complications associated with tongue piercing. Dental practitioners should educate patients about potential side effects and possible oral, dental, and systemic complications.

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