

## COVER STORY

# Formation of mucogingival defects associated with intraoral and perioral piercing

## Case reports

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The emergent interest in body adornment has stimulated a marked increase in the practice of intraoral and perioral piercing. The most commonly pierced oral sites are the tongue and lip (81.0 percent and 38.1 percent, respectively) among people with nontraditional body piercing.<sup>1</sup> Oral jewelry may be placed in one or multiple

locales.<sup>1</sup> Infrequently pierced areas include the cheek, uvula and lingual frenulum.<sup>2,3</sup> Results of a recent survey taken at an undergraduate university revealed 10.5 percent of the respondents (47 of 446) admitted to having had their tongues pierced.<sup>4</sup>

Health care practitioners have recognized various adverse incidents associated with the piercing of oral structures. In a survey of 438 pediatric dentists, nearly one-fourth acknowledged treating patients for oral piercing-related complications.<sup>5</sup> The most prevalent injury seen with oral jewelry is damage to the teeth, including chipping of the enamel, cuspal fractures and

deep-seated cracks extending to the pulp.<sup>1,6-14</sup> De Moor and colleagues<sup>13</sup> reported that 80.0 percent of patients (12 of 15) with tongue piercing manifested some tooth

**Background.** The authors provide clinical findings in five patients wearing oral jewelry to illustrate the risks of experiencing periodontal injury associated with body piercing involving intraoral and perioral sites. They also present a literature review of other adverse dental and medical consequences attributed to oral piercing.

**Case Descriptions.** Five young adult patients with tongue and lip piercing sought dental care. Each patient exhibited some degree of gingival recession and mucogingival defects in proximity of their oral jewelry. Three of these patients had probing depths ranging from 5 to 8 millimeters in the affected areas.

**Clinical Implications.** Intraoral and perioral jewelry may be associated with the development of significant mucogingival deformities. Because severe attachment loss can develop even when gingival recession is minimal, it is critical that patients with oral piercing routinely undergo comprehensive periodontal assessment. The authors urge clinicians to educate patients about the potential risks regarding the practice of oral piercing.

structure loss. They also observed chipping of porcelain crowns attributed to tongue jewelry.

Since 1997, at least 34 patients have been documented as having gingival recession and attachment loss attributable to oral piercing.<sup>1,13-24</sup> In a self-assessment questionnaire given to a cohort with oral piercing, 12.5 percent of people (three of 24) admitted to gingival injuries inflicted by lip piercing jewelry and a 7.8 percent (four of 51) incidence of gingival lesions caused by tongue jewelry.<sup>1</sup> Campbell and colleagues<sup>14</sup> reported a 19.2 percent incidence of gingival recession among 52 subjects with tongue piercing, as well as a positive correlation between the number of recession sites, barbell stem length and duration worn.

In this article, we present five cases

**Patients with intraoral or perioral piercing may be at increased risk of developing significant periodontal attachment loss involving proximal teeth.**

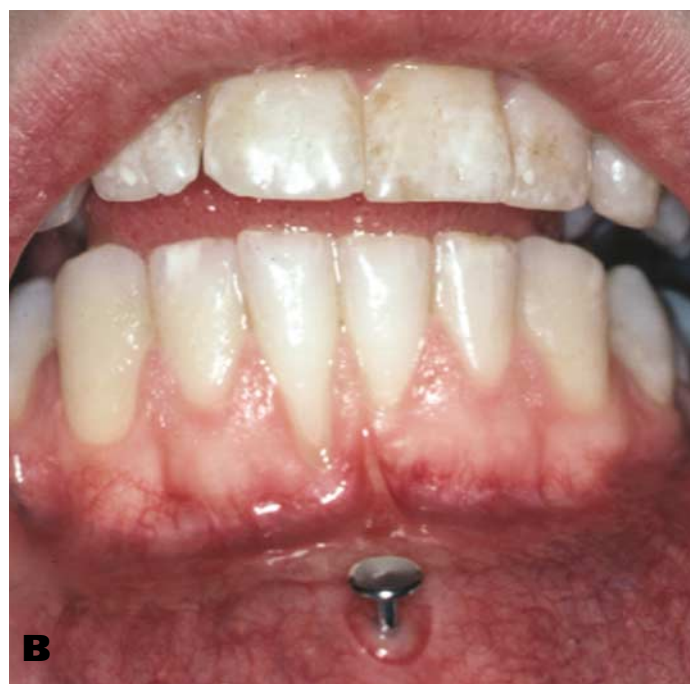
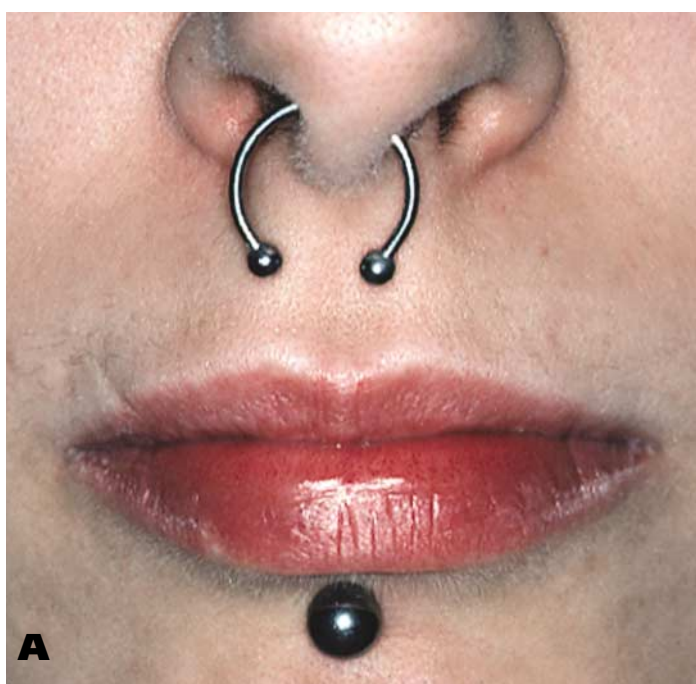
TABLE

### CASES OF MUCOGINGIVAL DEFECTS ASSOCIATED WITH INTRAORAL AND PERIORAL PIERCING.

CASE NO.	SEX	AGE (YEARS)	SITE OF RECESSION (TOOTH NUMBER AND AREA*)	TYPE OF PIERCING†	PROBING DEPTH (MILLIMETERS)	LENGTH OF TIME JEWELRY WORN
1	Female	24	24-F, 25-F	Lip	Normal	Two years
2	Female	25	25-L	Tongue	5	18 months
3	Female	19	25-L	Tongue	7-8	17 months
4	Female	25	24-L, 25-L	Tongue	5	Three to four years
5	Male	19	24-F, 25-F	Lip	Normal	Two years

\* F: Facial aspect; L: lingual aspect.

† In perioral piercing of the lip, jewelry usually is placed above the labiomental groove and below the vermilion border, and it is secured intraorally with a flattened screw cap or stud (a labret).



**Figure 1. Case 1. A. Nose and lip jewelry. B. View of gingival recession along the facial aspects of teeth nos. 24 and 25 induced by the flattened stud attachment on the lip.**

to illustrate the deleterious relationship observed between intraoral and perioral piercing jewelry and periodontal health (Table). We also briefly discuss the pathogenesis of mucogingival injury.

#### CASE REPORTS

**Case 1.** A 24-year-old woman sought dental care at the Dental School, University of Maryland, Baltimore, for multiple, painful teeth. Her medical history was significant for bipolar disorder and nickel allergy. The only medication she was taking was the combination oral contraceptive

ethinyl estradiol and levonorgestrel. The clinical examination revealed extensive caries in all four quadrants of her oral cavity and the presence of multiple pierced sites that involved the midline of the tongue, below the lower lip and the nose. The patient indicated she had had the tongue barbell for seven years and the perioral device for two years. We noted marked recession and narrow width of attached gingiva along the facial aspects of teeth nos. 24 and 25, opposing the stud attachment on the labial mucosa (Figure 1). We found that periodontal probings and the mobility of



**Figure 2. Case 2. A. Mild gingival recession along the lingual aspect of tooth no. 25 associated with tongue piercing. Slight chipping along the incisal edges of all the incisors can be seen. B. The recession was coincident with a 5-millimeter probing depth. C. Direct apposition of the barbell in the tongue against the lingual gingiva. A light accretion of calculus along the barbell can be seen.**

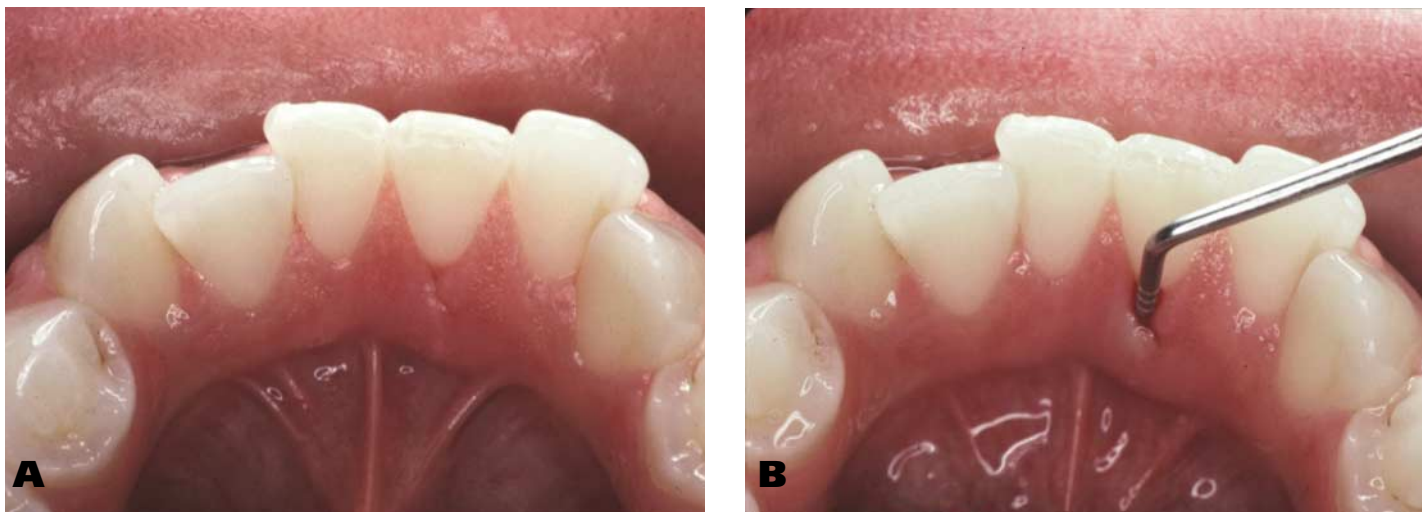
teeth nos. 23 through 26 were within normal limits. A periapical radiograph showed mild horizontal bone loss and widening of the periodontal ligament spaces associated with teeth nos. 24 and 25. After being told of the harmful oral health effect, the patient elected to discontinue wearing the lip jewelry to avoid further periodontal injury.

**Case 2.** An otherwise healthy 25-year-old woman was seen in private practice on an emergency basis for a fractured Class II amalgam restoration with recurrent caries along tooth no. 4. She had been seen in a private practice for routine dental care on a nine- to 12-month basis over the past five years. Her medical history was sig-

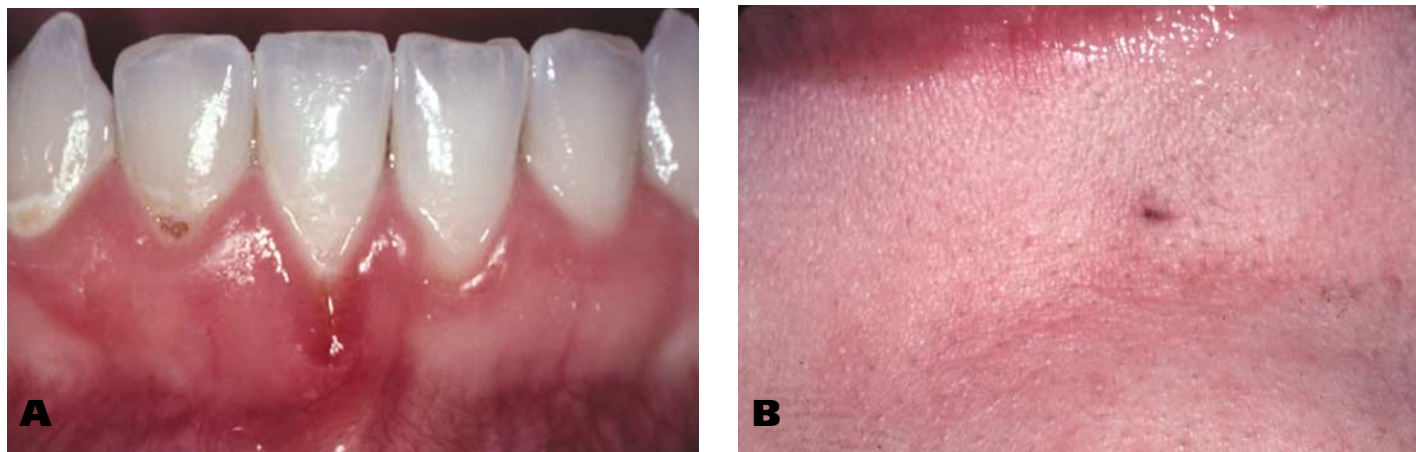
nificant for allergic sensitivity to penicillin and codeine. The patient underwent tongue piercing, involving the dorsoventral aspect about 18 months earlier, which permitted her to wear a barbell-designed ornament. On examination, we found that tooth no. 25 had approximately 1.5 millimeters of gingival recession and a probing depth of 5 mm on the direct lingual aspect of the tooth (Figure 2). The tooth was asymptomatic and responded normally to thermal tests. All other probing depths were 3 mm or less, with no clinically demonstrable gingival recession.

**Case 3.** An otherwise healthy 19-year-old woman sought routine dental care in a private practice; she had been seen previously on an intermittent basis. She had a barbell-like piece of jewelry penetrating the dorsoventral aspect of the tongue, which had been pierced approximately 12 months earlier. The periodontal examination revealed a probing depth of 6 mm on the direct lingual aspect of tooth no. 25. When we conducted a clinical examination five months later, we found 1 mm of gingival recession and a probing depth of 8 mm on the direct lingual aspect of the tooth, and a 7-mm pocket depth along the mesiolingual aspect of the tooth (Figure 3). The prognosis of this tooth is guarded. All other probing depths were 3 mm or less, and there were no other gingival recession sites.

**Case 4.** An otherwise healthy 25-year-old woman sought treatment for an abscessed carious tooth at the Dental School, University of Maryland, Baltimore. The only medication she was taking was the oral contraceptive medroxyprogesterone acetate. Oral evaluation was significant for multiple carious teeth and a barbell-type tongue



**Figure 3. Case 3. A. The lingual gingiva in a 19-year-old patient who had a pierced tongue. Mild recession and marginal inflammation are evident along tooth no. 25. B. Periodontal probing revealed an 8-millimeter pocket approaching the mucogingival junction that was caused by tongue jewelry.**



**Figure 4. Case 5. A. Significant dehiscence extending to the mucogingival junction along tooth no. 25 attributed to lip piercing stud (labret). Multiple cervical decalcifications and caries on the facial surface of tooth no. 26 can be seen. B. Perioral site of piercing along the labiomental groove initially was mistaken for a nevus. The lower lip is seen at the top of the figure.**

ornament along the midline, which had been inserted three to four years ago. The patient had undergone orthodontic therapy. Moderate gingival recession was noted on the lingual aspects of teeth nos. 24 and 25 and coincided with impingement from the barbell. Periodontal probings were within normal limits, with the exception of a 5-mm pocket on the mesiolingual aspect of tooth no. 25. We observed grade 1 mobility on teeth nos. 23 through 26. Radiographic findings were consistent with mild bone loss and widened periodontal ligament spaces involving these teeth. The patient chose to continue wearing her tongue ornament contrary to our recommendation.

**Case 5.** An otherwise healthy 19-year-old man

sought routine dental treatment at the Dental School, University of Maryland, Baltimore. He was taking no medications and had no known allergies. Oral examination revealed mild gingival recession along the facial aspect of tooth no. 24, with moderate gingival recession and narrow width of attached gingiva on the facial aspect of tooth no. 25. No frenum involvement was present. The patient denied any aggressive oral hygiene habits. The etiology of the localized recession initially was unclear, as the patient did not present with any apparent intraoral or perioral piercing. The patient subsequently admitted to wearing a lip piercing bar for two years and habitually “liked to play with it.” The perioral piercing site

appeared dark in color and resembled surrounding facial nevi (Figure 4).

## DISCUSSION

While intraoral and perioral piercing have become increasingly popular modes of self-expression, they have promoted an array of health concerns. Since 1997, at least 34 patients have been documented as having gingival recession related to oral piercing. With the five cases described in this article, the total number is 39 (Box).<sup>1,13-24</sup> In three previously reported cases, six gingival lesions were attributed to both tongue and lip jewelry, bringing the total number of affected gingival sites to at least 42.

The patient described by Dibart and colleagues<sup>22</sup> developed gingival recession on the facial and lingual aspects of a tooth as a result of tongue and lip piercing. Two patients reported by Campbell and colleagues<sup>14</sup> developed lip piercing-related gingival lesions, and additional data revealed that these patients also experienced gingival injuries due to tongue piercing (D.N. Tatakis, D.D.S., Ph.D., professor, Periodontology, The Ohio State University, written communication, Jan. 2, 2003). We excluded from analysis two cases by Sardella and colleagues,<sup>24</sup> as the clinical presentation of recession suggested pre-existing conditions. One case displayed localized root staining, and the other manifested generalized marginal inflammation with apparent localized root staining.

The majority of periodontal lesions reported with oral piercing involved use of tongue jewelry, seen in 64.3 percent of the affected sites (27 of 42), and lip jewelry, seen in 35.7 percent of the affected sites (15 of 42). The site of gingival recession most frequently recorded with tongue piercing was the lingual aspect for both teeth nos. 24 and 25 and was seen in 75.0 percent of the patients (nine of 12 who specified site affected). In the series reported by Campbell and colleagues,<sup>14</sup> an 18-year-old man developed gingival recession along tooth no. 25 associated with lip piercing. Additional information revealed concurrent recession along the lingual aspects of teeth nos. 23, 24 and 26, which was attributed to the patient's wearing of an unusually large diameter (OO gauge, 9.25 mm) tongue barbell. The lack of gingival recession along the lingual aspect of tooth no. 25 was attributed to its labial malposition, relative to the remaining crowded mandibular incisors (D.N. Tatakis, D.D.S., Ph.D., professor,

## BOX

### DEMOGRAPHIC PROFILE OF MUCOGINGIVAL DEFECTS INDUCED BY INTRAORAL AND PERIORAL PIERCING.<sup>1,13-24\*</sup>

<b>PATIENTS (NO.)</b>	39
<b>SEX (NO.)</b>	
Male	7
Female	11
Not specified	23
<b>AGE (REPORTED BY 18 OF 39 PATIENTS)</b>	
Average	22.4 years
Range	16-32 years
<b>SITES AFFECTED (NO.)</b>	42
Tongue	27
Teeth no. 24 and 25, lingual aspect	9
Tooth no. 25, lingual aspect	2
Teeth nos. 23, 24 and 26, lingual aspect	1
Not specified	15
Lip	15
Tooth no. 25, facial aspect	7
Teeth no. 24 and 25, facial aspect	5
Not specified	3
<b>PROBING DEPTHS (11 OF 42 SITES)</b>	6
Normal	6 sites
Pockets	5 sites
Average pocket depth	6.2 millimeters, range 5-8 mm
Not specified	31 sites
<b>LENGTH OF TIME JEWELRY WORN</b>	27.3 months, range 2 months-9 years
* Cases 1 through 5 from the study are included in this profile.	

Periodontology, The Ohio State University, written communication, Jan. 2, 2003). Injuries caused by lip jewelry, when specified, were localized to the facial aspect of tooth no. 25 in 58.3 percent of the reported cases (seven of 12 that specified a site) and in the area of teeth nos. 24

and 25 in 41.7 percent of the reported cases (five of 12 that specified a site).

The development of gingival recession is related to multiple etiologic and local predisposing factors that often act in a combinatorial manner.<sup>25</sup> Regardless of etiologic factors—including physical trauma—the common outcome of injury is gingival inflammation. Clinical and histologic observations suggest that inflammation results in attachment loss due to lysis of connective tissue fibers, proliferation of epithelium and resorption of alveolar bone.<sup>26-28</sup> Periodontal pocketing presumably occurs when oral contaminants or other factors interfere with epithelial adhesion to the root surface.<sup>27</sup> With destruction of the subjacent and intervening connective-tissue matrix, the proliferating sulcular epithelium eventually coalesces with the proximate oral epithelium. Apical movement of the marginal gingiva results in the development of a recession defect.

Attachment loss may effect significant pocketing that precedes the development of a gingival recession defect. Case 3 in our report demonstrated advanced pocket formation (8 mm) with minimal recession (1 mm) involving the lingual aspect of tooth no. 25 within 17 months of wearing tongue jewelry. A periodontal evaluation completed approximately 12 months before the piercing found probing depths of 3 mm or less.

The mean length of time oral jewelry was worn in the reported cases was 27.3 months, ranging from two months to nine years. Campbell and colleagues<sup>14</sup> documented gingival recession on the lingual aspect only among patients who wore tongue jewelry for more than 24 months. Although periodontal probing depths were not included in their article, attachment loss and pocketing on the lingual aspect of the incisors may have been present. Importantly, trauma intensity may be sufficient to induce attachment loss, but the injury duration may be inadequate for the development of recession.

In general, the earlier the detection of attachment loss and recession, the more amenable such periodontal defects are to treatment. The literature suggests that jewelry-associated recession frequently develops as a narrow, cleft-like defect on the lingual aspect of the mandibular incisors,<sup>22</sup> with recession depths of 2 to 3 mm or greater, often extending to or beyond the level of the mucogingival junction.<sup>14</sup> Thinner gingival tissues may be at a greater risk of experiencing breakdown and recession than are thicker gingival tis-

sues.<sup>29-34</sup> In the presence of a narrow zone of attached gingiva, even relatively moderate recession may extend to or beyond the level of the mucogingival junction. Significant technical and anatomical constraints currently limit regenerative management of moderate-to-severe mucogingival defects affecting the lingual gingiva.

Additional adverse dental consequences of intraoral and perioral jewelry reported in the literature include chipped or fractured teeth; pain, edema, infection, inflammation or nerve damage in the piercing site; masticatory difficulty; dysphagia; interference with speech; hypersalivation; scar tissue or granuloma formation; sarcoidlike foreign body reaction; stud entrapment in the piercing site; lymphadenitis; chronic sialadenitis; calculus formation on the piercing component; and metal allergy.<sup>1,35-41</sup> Medical complications associated with oral piercing include hepatitis, tetanus, Ludwig's angina, endocarditis, brain abscess, excessive bleeding, airway obstruction, and aspiration or swallowing of loosened components.<sup>1,16,42-52</sup> Recently, the onset of a breast abscess and *Neisseria meningitidis* pericarditis have been associated with the practice of tongue piercing (J.D. Richardson, M.D., assistant professor, Clinical Medicine, Indiana School of Medicine, written communication, Dec. 30, 2002).

## CONCLUSION

Patients with intraoral or perioral piercing may be at increased risk of developing significant periodontal attachment loss involving proximal teeth. In the absence of gingival recession, such attachment loss could escape detection without an appropriate periodontal examination. In the same fashion that dental health care personnel have immersed themselves in antismoking and smokeless tobacco campaigns, the dental profession needs to become more vocal in educating the public about the medical and dental risks associated with oral piercing and oral jewelry. Furthermore, dental professionals need to emphasize that wearing oral piercing ornaments, even over relatively short periods, may result in significant mucogingival deformities that are not ameliorative to satisfactory surgical outcome and, in fact, may lead to tooth loss. ■

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