

超强粘接剂联合前牙美学树脂修复在重度牙周炎中的应用

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摘要: **目的** 探究超强粘接剂联合前牙美学树脂修复在恢复重度牙周炎患牙功能和美观的可行性。 **方法** 收集 2018 年 9 月—2019 年 9 月共 20 例前牙区重度牙周炎患者的患牙 80 颗,使用超强粘接剂联合前牙美学树脂修复的微创修复方法恢复患牙的功能和美观。随访 3~4 a,收集患者的临床和影像学资料,调查患者的满意度,并采用配对 *t* 检验对数据进行分析。 **结果** 随访期间,患牙存留率为 100%,患者满意度为 100%,微创修复成功率为 90%。牙槽骨的吸收情况与修复前相似,无加重趋势。微创修复后 3~4 a,牙周探诊深度与修复前比较,差别无统计学意义($P>0.05$);牙龈退缩则较修复前有所改善($P<0.05$)。 **结论** 对于牙槽骨吸收根长 1/2~2/3 的重度牙周炎患牙,超强粘接剂联合前牙美学树脂修复不仅可保留患牙,且可获得较稳定的前牙美观和功能。

关键词: 前牙美学树脂修复; 超强粘接剂; 松牙固定; 牙周炎; 微创修复

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前牙区域牙槽骨吸收根长 1/2~2/3 的重度牙周炎患者,在牙周系统治疗后不可避免地出现前牙区域牙龈退缩(gingival recession, GR),严重影响患者的美观及咬合功能^[1]。对于重度牙周炎患者的治疗,以往常于拔除患牙后行种植修复、活动义齿修复或固定长桥修复等,也有少数经根管治疗后行连冠修复。这些治疗方式均存在创伤大、费用高等缺点,很多患者无法接受。联合运用前牙美学树脂修复术和超强粘接剂松牙固定术,不仅可满足患者的美观需求并恢复部分咬合功能,且创伤小、经济实惠,对重度牙周炎患者的后期美学修复具有重要意义。本研究收集 20 例患者共 80 颗牙槽骨重度吸收的前牙区域患牙,在经牙周系统治疗后,上前牙区域联合运用前牙美学树脂修复术和松牙固定术恢复患者的美学及部分咬合功能,经 3~4 a 的随访,取得了良好的临床效果。

1 对象与方法

1.1 对象 回顾性收集 2018 年 9 月—2019 年 9 月就诊于福建医科大学附属口腔医院门诊,根据 2018 年新分类诊断为牙周炎Ⅲ期 B 级的患者 20 例,以前牙区域牙槽骨破坏严重,甚至需拔除的患牙为研究对象,共纳入患牙 80 颗。纳入标准:(1)年龄 30~50 岁,无系统性疾病及感染病史;

(2)无吸烟史;(3)非妊娠期;(4)患牙牙体完整,Miller Ⅲ 类 GR,松动 I°~Ⅲ°,曲面全景片显示,牙槽骨吸收根长的 1/2~2/3;(5)患者保留天然牙的意愿强烈,并接受治疗失败后前牙区域 GR 或仍需拔除患牙的风险;(6)患牙与邻牙固定后整体松动度<I°。排除标准:(1)患牙为残根残冠或全冠修复;(2)前牙区域牙列拥挤严重;(3)患者依从性差,无保留患牙意愿且不愿接受治疗。本研究经医院伦理委员会批准〔〔2021〕福医口伦理审字第(71)号〕。

1.2 方法 80 颗患牙治疗前牙槽骨吸收根长的 1/2~2/3,为防止在治疗过程中脱落,在进行超声龈上洁治后,对松动Ⅱ°~Ⅲ°的患牙采用超强粘接剂(Super-Bond C&B,日本日进齿科公司)进行暂时性松牙固定。具体操作如下:橡皮障隔湿,吹干,邻间隙楔入楔子,以防粘接剂充填龈乳头影响后期的牙周维护;邻牙之间表面涂抹釉质粘接剂 30 s,冲洗 30 s,吹干;取粘接材料单体 4 滴,加催化剂 1 滴,在专用调盘中混匀,笔堆式将超强粘接剂涂入邻接并修形;7~8 min 后待其全硬化后,再次进行修形,调合抛光。后期再进行龈下刮治和根面平整,必要时进行牙周手术治疗。

牙周系统治疗后,待牙周情况稳定 1~2 个月时进行复诊,此时菌斑面积<20%,牙周探诊深度(probing depth, PD)为 1~3 mm,探诊出血(bleeding on probing, BOP)(-),但患者前牙区域出现严重 GR 和“黑三角”,影响美观。此时可拆除原暂时性松牙固定,取研究模、术前比色、制备诊断蜡型、硅橡胶导板、使用前牙美学树脂(BRILLIANT™ NG, 瑞士康特公司)恢复患牙的形态和功能,在不影响后

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期牙周维护治疗的前提下,尽可能缩小“黑三角”。随后运用超强粘接剂对前牙美学树脂修复后的患牙进行牙周夹板固定、调合。随访 3~4 a,定期进行牙周维护治疗,并收集牙周指数、影像学资料及患者满意度等资料。

1.3 观察指标 由同一名医师完成以下检测工作:(1)定期观察患牙及充填体的存留情况、患牙牙周夹板断裂及松动移位情况;(2)问卷形式调查患者的满意度;(3)记录微创修复前及修复后 3~4 a 的 PD 和 GR;(4)影像学比较观察微创修复前及修复后 3~4 a 患牙剩余牙槽骨的高度和牙槽骨的吸收情况。

1.4 统计学处理 采用 SPSS 22.0 软件对数据进行统计分析。配对 t 检验比较微创修复前及修复后 3~4 a 牙周指数(PD 和 GR)的变化。 $P<0.05$ 为差别有统计学意义。

2 结果

2.1 修复体和患牙的存留率以及患者的满意度 联合运用前牙美学树脂修复术和超强粘接剂松牙固定术的微创修复方法后,80 颗患牙在临床随访的 3~4 a 期间,患牙存留率为 100%;牙周夹板断裂 8 颗,树脂未脱落但切角缺损 2 颗,成功率为 90%。失败的案例多发生在随访的 2~3 a,因患者突咬硬物所致,在重新进行微创修复后可正常使用。问卷调查显示,患者虽表明微创修复后患牙的美观及咬合功能方面不及正常健康牙,但对于原先保留无望的患牙可恢复到现有稳定的美观及咬合功能表示较满意,满意度为 100%。

2.2 PD 与 GR 的变化 记录每颗患牙唇、腭侧的远中、中央、近中 6 个位点的 PD 值和 GR 值,并比较微创修复前和修复后 3~4 a 二者的变化。结果显示:微创修复前的 PD 值与修复后比较,差别无统计学意义($P>0.05$),而 GR 值明显高于修复后,二者差别有统计学意义($P<0.05$),即治疗后 GR 较治疗前减轻(表 1)。

2.3 影像学变化 微创修复前及修复后 3~4 a 的曲面全景片显示:患牙剩余牙槽骨高度与微创修复前相比,未见明显变化;牙槽骨的吸收情况与微创修复前相似,无加重趋势。

2.4 典型病例 典型病例 1(图 1):11~13 和 21~23 经牙周系统治疗后,牙周情况稳定。临床检查显示:11、12、21、22 存在散状间隙,PD 为 1~3 mm,GR 为 1~2 mm,BOP(-),松 I°~II°;

表 1 微创修复前和修复后 3~4 a 的 PD 和 GR 值比较

Tab. 1 Comparison of PD and GR values before and 3-4 years after minimally invasive treatment

修复前后	l_{PD}/mm	l_{GR}/mm
微创修复前	2.40 ± 0.42	1.59 ± 1.05
微创修复后 3~4 a	2.34 ± 0.43	$1.22 \pm 1.03^{*}$

PD:牙周探诊深度;GR:牙龈退缩。与修复前比较,* $P<0.05$ 。

13、23 松(-)。曲面全景片显示:11、12、21、22 牙槽骨吸收根长 1/2 左右,13、23 牙槽骨吸收根长的 1/3~1/2。联合运用前牙美学树脂修复术和超强粘接剂松牙固定术恢复 11、12、21、22 的美观及部分咬合功能。随访 4 a,牙周情况稳定,充填体及牙周夹板尚存,PD 为 1~3 mm,GR 为 0~2 mm,BOP(-)。典型病例 2(图 2):41~43 和 31~33 经牙周系统治疗后,临床检查显示,41、42、31 存在间隙,原牙周夹板部分脱落,PD 为 1~3 mm,GR 为 4~5 mm;32、33、43 PD 为 2~3 mm,GR 为 1~3 mm;41、42、31 松 II°~III°,32 松 I°~II°,43、33 松(-)。曲面全景片显示:41、42、31 牙槽骨吸收根长 2/3 左右,32 牙槽骨吸收 1/2~2/3,43、33 牙槽骨吸收根长 1/3~1/2。拆除原牙周夹板,微创修复后 4 a,牙周情况稳定,充填体及牙周夹板尚存。2 例患者临床均可见微创修复后前牙牙龈“黑三角”明显改善,部分龈乳头较前丰满,且恢复部分咬合功能。曲面全景片显示:牙槽骨吸收情况与修复前相似,无加重趋势(图 1~2)。

3 讨论

牙槽骨重度吸收的前牙往往存在严重的 GR 和牙齿松动,迫切需要一种不仅能使美观和咬合功能得到一定恢复,且经济实惠的新方法。已有大量研究显示,松牙固定可以改善患牙的牙周状况,提高患牙的保存率^[2-4]。而牙周炎患者除了存在因龈乳头退缩产生的“黑三角”^[5],治疗后还常出现 Miller III 或 IV 类 GR,不可能完全恢复根面覆盖^[1]。前牙美学树脂修复术具有微创、易重新修复、性价比高等优点^[6-7],适当的修复更能有效改善牙周健康,提高美学评分^[8-10]。

在现今众多牙周夹板固定方式中,超强粘接剂松牙固定方式,因不仅可改善牙周的临床状况、恢复患者的咀嚼功能,且异物感小、舒适而美观,深受广大患者喜欢^[11]。ZHANG 等^[3]对 61 例重度牙周炎患者的 161 颗下前牙行松牙固定术,术后平均随

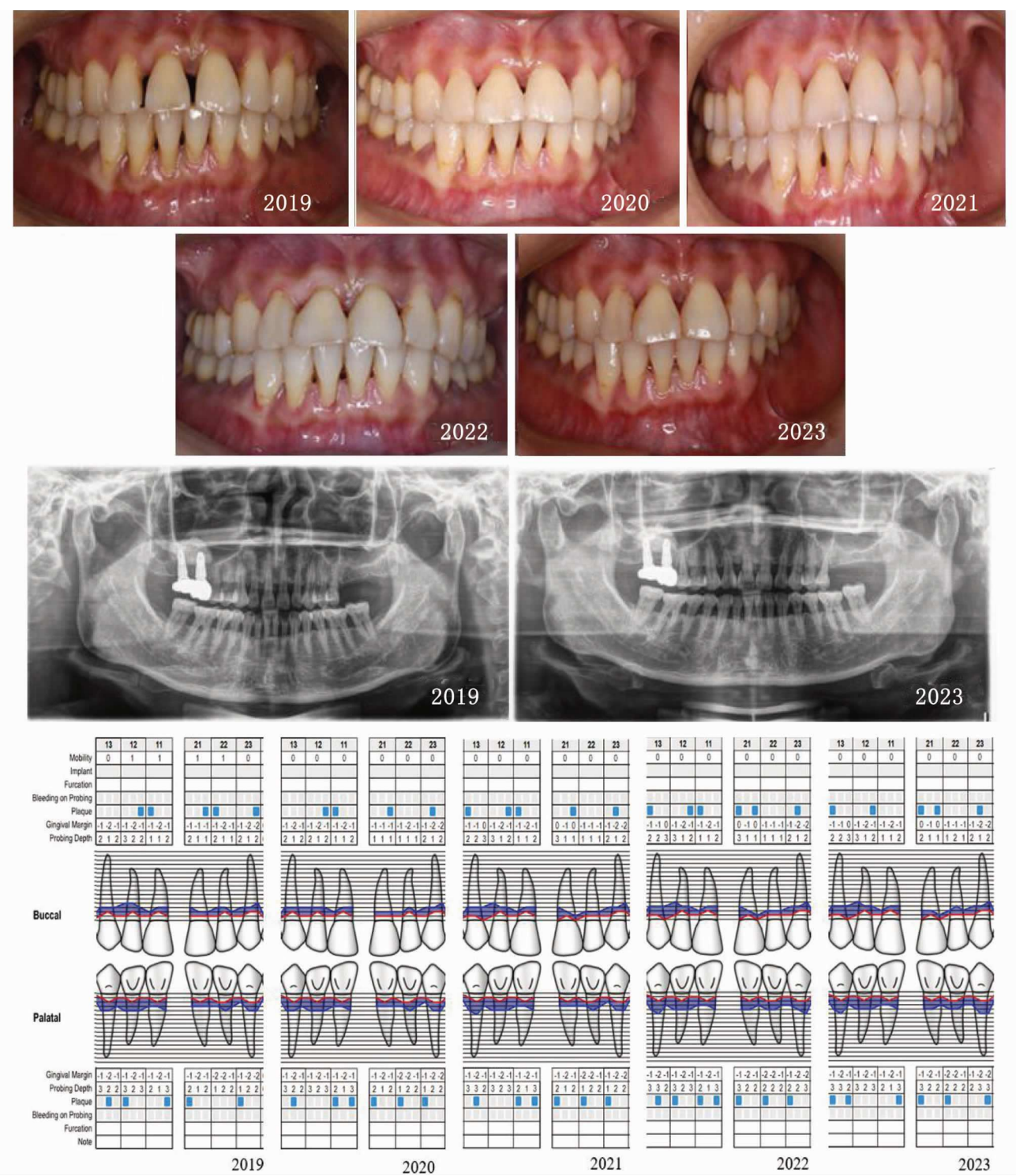


图 1 典型病例 1
Fig. 1 Classic case 1

访 5.44 a, PD 从 4.31 mm 下降到 2.93 mm, 临床附着丧失从 5.02 mm 下降到 4.58 mm; 患牙存活率为 100%; 牙周夹板整体存留率为 65%。本研究运用超强粘接剂行牙周夹板固定, 临床随访 3~4 a, 结果显示, 行松牙固定的 80 颗患牙存活率为 100%, 牙周夹板整体存留率为 90%, 且患牙牙周情况稳定,

无加重趋势, 与上述文献一致。

在红白美学的恢复方面, 国内外学者研究表明, 牙冠的外形、接触点至牙槽嵴顶的距离、牙间距、根间分离角、龈外展间隙形态等因素均会影响龈乳头的高度^[12-15]。CLARK 等^[16]曾通过利用树脂重塑牙冠对龈乳头底部产生挤压, 诱导龈乳头往冠方迁

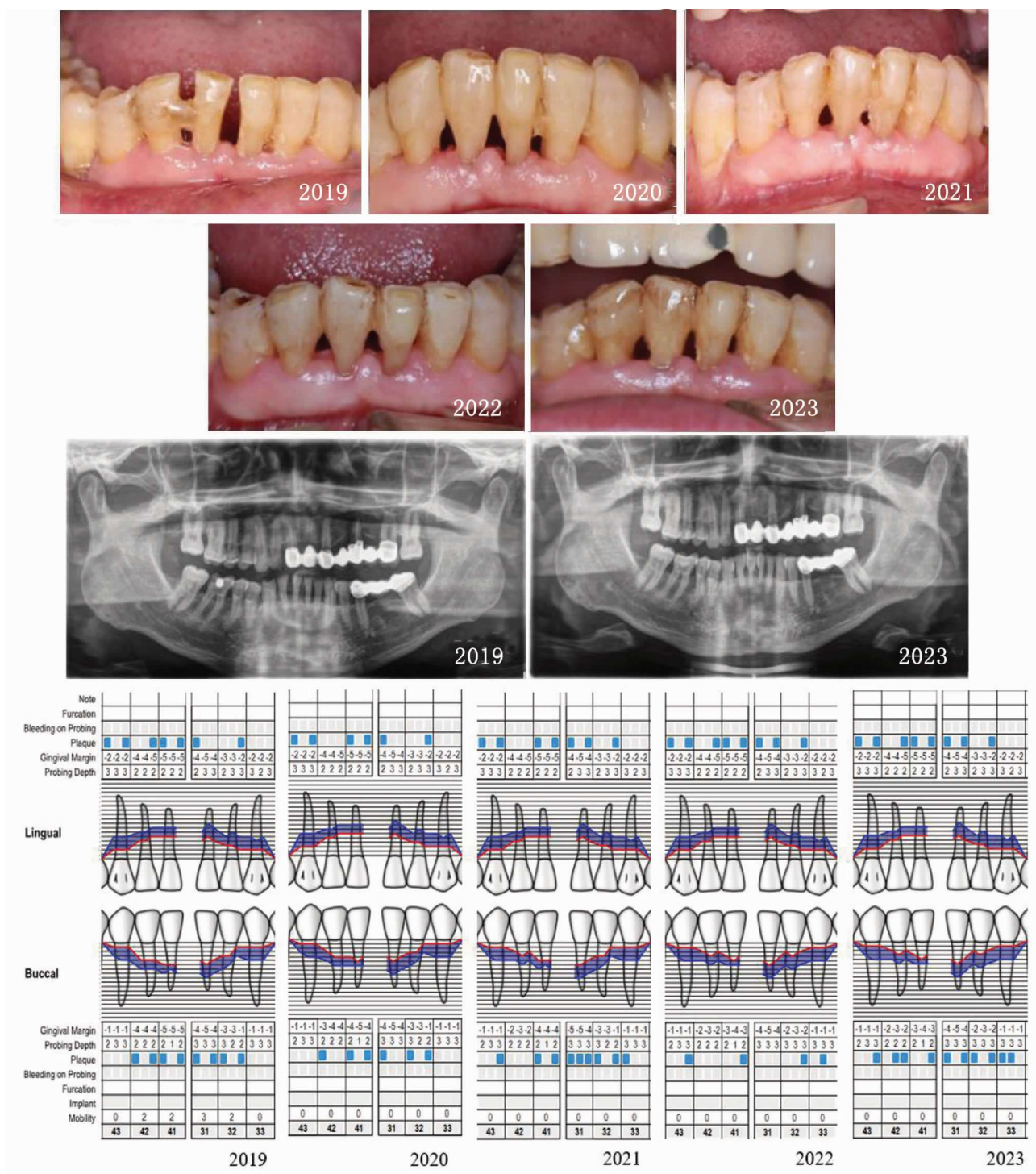


图2 典型病例2

Fig. 2 Classic case 2

移,从而达到关闭龈乳头“黑三角”的目的。RICCI 等^[17]研究表明,复合树脂前牙美学修复可实现牙齿的美学重建和牙间隙的关闭,是一种可恢复牙周病患牙功能和美观的微创疗法。本研究使用前牙美学树脂修复,在不影响后期牙周维护的前提下,通过其调整牙冠外形及牙龈外展间隙、缩短邻接点至牙槽嵴顶的距离等,尽可能缩小“黑三角”的面积。患者

对修复后美观及咬合功能方面满意度为 100%。随访 3~4 a,龈乳头较之前丰满,前牙更加自然美观。

综上所述,本研究通过前牙美学树脂修复和超强粘接剂联合治疗,不仅保存了患牙及其牙髓,而且降低了根折的风险。同期运用超强粘接剂行松牙固定,粘接剂与树脂的粘接效果较好,松牙固定效果也较为牢靠。本研究的病例属于 Miller III 类 GR,通

过美学树脂调整牙冠形态,缩小了“黑三角”的面积,修复过程并未过多磨除牙体组织,当超强粘接剂脱落或充填体脱落时,也容易进行重新修复。对重度牙周炎患者而言,两者联合治疗是一种兼具实用美观和经济实惠的新方法。

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The Application of Super-Strong Binder Combined with Aesthetic Restoration of Anterior Teeth with Resin in the Treatment of Severe Periodontitis

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ABSTRACT: **Objective** It is to investigate the feasibility of the treatment with super-strong binder combined with aesthetic resin restoration of anterior teeth in restoring function and aesthetics of teeth with severe periodontitis. **Methods** From September 2018 to September 2019, a total of 80 teeth with severe periodontitis in the anterior region of 20 patients were collected. The function and aesthetics of the affected teeth were restored by minimally invasive restoration with super-strong binder combined with aesthetic resin restoration of the anterior teeth. The patients were followed up for 3 to 4 years, clinical and imaging data as well as patient satisfaction were collected, and the data were analyzed by paired *t*-test.

Results During the follow-up period, the retention rate of affected teeth was 100%, the patient satisfaction was 100%, and the success rate of minimally invasive restoration was 90%. The resorption of alveo-

lar bone was similar to that before minimally invasive repair, without aggravation. 3 to 4 years after minimally invasive restoration, the depth of periodontal probe was not significantly different from that before minimally invasive restoration ($P>0.05$), and gingival recession was improved compared with that before minimally invasive restoration ($P<0.05$). **Conclusion** For the teeth with severe periodontitis whose alveolar bone resorption is about 1/2 to 2/3 of the root length, the combination of super-strong binder and aesthetic resin restoration of anterior teeth can not only preserve the affected teeth, but also obtain a more stable appearance and function of the anterior teeth.

KEY WORDS: aesthetic restoration of anterior teeth with resin; super-strong binder; loose tooth fixation; periodontitis; minimally invasive restoration

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Preliminary Study on the Performance of Human Dental Radiation Protection Mold

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ABSTRACT: **Objective** A model was established to study the resistance efficiency of high-energy X-ray (6 MV) of different thickness and specifications, and provide the experimental basis for later clinical experiments. **Methods** A 2 cm × 10 cm lead sheet was cut from the lead sheet with a thickness of 1 mm, and shaped into a standard arch form then embedded in silicone rubber, mixed 1 : 1. The silicone rubber has a thickness of 1 mm on both sides for one set, 3 mm for another set, and 5 mm for a third set, all of which were designed as the experimental groups. The control group consisted of arches made from 2 cm × 10 cm lead sheets with thickness of 3, 7, and 11 mm. These lead arches were also embedded in silicone rubber and shaped into standard dental arch forms. The isolated third molar was embedded on the plaster model and the residual amount of X lines was measured with 6 MV energy X-rays at a dose of 1 Gy/times. **Results** The barrier efficiency of the experimental group was significantly higher than that of the control group, and the difference was statistically significant ($P<0.001$); The barrier efficiency of the control group was increased with the increase of the silicone rubber thickness, and the difference was statistically significant ($P<0.001$); The experimental group was reduced with the increase of the silicone rubber thickness, and the difference was statistically significant ($P=0.023$). **Conclusion** The silicone rubber thickness has some influence on the barrier efficiency. It is feasible to design the protective mold with silicone rubber embedded lead sheet. Further optimization and adjustment of the thickness and proportion of lead sheet and silicone rubber are needed in subsequent research.

KEY WORDS: human permanent teeth; radiotherapeutics; silicone rubber; barrier efficiency; protective mold

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