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## 游离龈移植术后龈瓣收缩效果的临床研究

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**摘要 目的:**评估游离龈移植术后3个月内龈瓣在垂直向、水平向宽度改变并计算其表面积的收缩情况。**方法:**选取23例Miller III类牙龈退缩患者,因下颌前牙区颊侧角化龈宽度不足(<2 mm)行游离龈移植术。分别比较基线、术后1和3月游离龈瓣水平向及垂直向宽度的改变并计算龈瓣表面积的收缩情况。**结果:**经游离龈移植术的23例患者术区游离龈全部成活,牙龈无红肿,附着龈宽度可达3-5 mm。基线处、术后1月、3月水平向龈瓣宽度分别为 $9.83\pm 1.7$ 、 $8.97\pm 1.5$ 、 $8.48\pm 1.65$  mm;基线水平、术后1月、3月垂直向龈瓣宽度分别为 $4.02\pm 0.61$ 、 $3.61\pm 0.67$ 、 $3.24\pm 0.67$  mm。与基线时比较,术后1月、3月水平向、垂直向龈瓣宽度、龈瓣表面积均明显降低,差异均具有显著差异( $P<0.05$ )。**结论:**游离龈移植术可增加牙龈退缩患者的附着龈宽度,术后龈瓣存在水平向和垂直向收缩,且垂直向更明显。此外,龈瓣收缩存在个体差异。

**关键词:**游离龈移植术;收缩;附着龈

**中图分类号:**R781.41;R617 **文献标识码:**A **文章编号:**1673-6273(2019)05-876-04

## Clinical Efficacy of Free Gingival Graft Shrinkage in the Treatment of Gingival Recession\*

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**ABSTRACT Objective:** To evaluate the shrinkage of free gingival graft in horizontal and vertical dimensions and calculate the changes in the surface area of gingival graft in the treatment of gingival recession within 3 months. **Methods:** A total of 23 patients with Miller class III gingival recession and insufficient keratinized gingivae (<2 mm) in their mandibular anterior teeth were enrolled and underwent free gingival graft. The vertical shrinkage, horizontal shrinkage and change in the surface area were assessed at baseline, 1 and 3 months postoperation. **Results:** The free gingivae of 23 patients survived after free gingival graft operation and gingivae had no swelling and the attached gingiva width was up to 3-5 mm. The vertical dimension of gingiva was  $9.83\pm 1.7$ ,  $8.97\pm 1.5$ ,  $8.48\pm 1.65$  mm at baseline, 1 month and 3 months respectively. The horizontal dimension of gingiva was  $4.02\pm 0.61$ ,  $3.61\pm 0.67$ ,  $3.24\pm 0.67$  mm at baseline, 1 month and 3 months respectively. Compared with the baseline, the vertical shrinkage, horizontal shrinkage and the surface area were decreased at 1 and 3 months postoperation ( $P<0.05$ ). **Conclusions:** Free gingival graft was an effective method for enhancing the width of keratinized gingivae. The shrinkage of horizontal and vertical dimensions of the grafts almost existed every patients with time, especially in the latter dimensions. In addition, the different dimensional changes was observed in individual level.

**Key words:** Free gingival graft operation; Shrinkage; Attached gingiva

**Chinese Library Classification (CLC):** R781.41; R617 **Document code:** A

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### 前言

牙周病是发生于牙齿周围硬组织(牙槽骨、牙骨质)及软组织(牙龈、牙周膜)的不可逆性炎症性疾病,其中牙龈退缩引起的根面暴露是牙周病主要的临床症状之一。牙龈退缩是指牙龈边缘退至釉牙骨质界面以下,导致牙根表面暴露和牙龈附着丧失<sup>[1]</sup>。牙龈退缩可诱发牙齿敏感,根面龋,牙周附着丧失甚至牙齿脱落的发生<sup>[1-3]</sup>。大量研究表明足够宽度的附着龈是维持健康牙周

组织和抵抗炎症导致的附着丧失的关键因素<sup>[3,4]</sup>。自1972年,Lang等对天然牙进行研究后认为不少于2 mm冠根向角化龈宽度是维持牙周软组织健康的基本条件。

游离龈移植技术(Free gingival graft)是常用的应用于增加附着龈宽度和治疗牙龈退缩的牙周手术之一<sup>[5]</sup>。但国外有研究报道游离龈移植术后龈瓣可能发生垂直向和水平向收缩改变,尤其是在术后第一个月<sup>[6]</sup>。这对于我们应用游离龈移植术增宽角化龈宽度或者进行根面覆盖时具有重要的参考价值。目前,国内相关报道少见。因此,本研究主要比较了游离龈瓣在术后3个月内收缩状况,以期为临床上进行该类手术提供一定的术前参考依据。

### 1 材料和方法

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1.1 临床资料

选择 2015 年 1 月 -2017 年 9 月于上海市第一人民医院就诊的 Miller III 类牙龈退缩患者 23 例为研究对象, 包括男性 9 例, 女性 14 例, 年龄 24~48 岁, 平均 36.7 岁。Miller 于 1985 年根据牙龈退缩的程度, 对牙根暴露的病损进行了分类。I 类: 龈缘退缩未达到膜龈联合处, 邻面无牙槽骨或软组织的丧失。II 类: 龈缘退缩达到或超过膜龈联合, 但邻面无牙槽骨或软组织的丧失。III 类: 龈缘退缩达到或超过膜龈联合, 邻面牙槽骨或软组织有丧失, 位于釉牙骨质界的根方, 但仍位于唇侧退缩龈缘的冠方。IV 类: 龈缘退缩超过膜龈联合, 邻面骨丧失已达到唇侧龈退缩的水平<sup>[78]</sup>。患者纳入标准: ①局部粘膜无病变; ②牙龈 Miller III; ③下颌前牙区根方角化龈宽度 (keratinized tissue height, KTH) ≤ 2 mm, 可进行牙周手术的患者。患者排除标准: ①龈上修复体; ②口腔卫生差; ③吸烟; ④妊娠。

1.2 手术方法

所有病例手术切口参照 Zucchelli 等所著书籍《Mucogingival Esthetic Surgery》提出的“游离龈移植技术”。①预备骨膜结缔组织床: 用 15# 刀片于受植区膜龈联合处做约 4~6 mm 水平切口, 锐性分离黏膜, 两边各超出受植区半个牙位, 保留骨膜及少量结缔组织在骨面, 将半厚膜推向根方; ②游离龈瓣的获取: 局麻下, 在距龈缘 2 mm 的上颌第一磨牙至前磨牙的腭侧切取一块半厚瓣, 宽度与长度与受植区大小相符, 厚度 1~1.5 mm, 生理盐水清洗, 修剪半厚瓣, 去除脂肪组织及腺体; ③将半厚瓣置于切口骨膜上进行固定缝合, 游离龈瓣使用 4-0 缝线进行缝合, 压迫止血, 排净下方淤血和空气; 腭部的创口采用凡士林碘仿纱条打包缝合。

1.3 术后评价指标

术后 2 周内使用 0.12% 氯己定含漱控制牙菌斑, 每日含漱 2 次, 每次 1 min, 术后 2 周内不可进行机械性菌斑控制(刷牙、牙缝刷及冲牙器等), 术后 2 周拆线。分别于基线、术后 1 月、3 月拍摄临床照片, 参考学者 Hatipoglu 报道的方法<sup>[9]</sup>进行临床记录, 观察游离龈瓣垂直向及水平向附着龈宽度、受植区软组织瓣面积改变情况, 初步评价患者术后龈瓣组织收缩情况及手术疗效。详见如下(图 1): 龈瓣垂直向宽度: 选取龈瓣水平向中点

处, 使用牙周探针量取其高度; 龈瓣水平向宽度: 选取龈瓣垂直向中点处, 使用牙周探针量取其长度; 龈瓣表面积 = 龈瓣水平向宽度 × 龈瓣垂直向宽度;

$$\text{收缩率(垂直向)} = \frac{\text{术前垂直向宽度} - \text{术后垂直向宽度}}{\text{术前垂直向宽度}} \times 100\%;$$

$$\text{收缩率(水平向)} = \frac{\text{术前水平向宽度} - \text{术后水平向宽度}}{\text{术前水平向宽度}} \times 100\%;$$

$$\text{收缩率(表面积)} = \frac{\text{术前龈瓣表面积} - \text{术后龈瓣表面积}}{\text{术前龈瓣表面积}} \times 100\%;$$

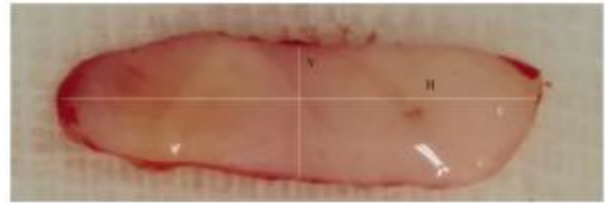


图 1 龈瓣水平向宽度(Horizontal, H)及垂直向宽度(Vertical, V)测量

Fig.1 The measure of gingivain horizontal and vertical dimensions

1.4 统计学分析

将 23 例患者手术前后的评价指标进行比较, 采用 SPSS17.0 对数据进行配对 t 检验统计学分析, 以 P<0.05 为差异具有统计学意义。

2 结果

23 例患者术区游离龈瓣均成活, 术区牙龈无红肿, 颜色呈粉红色, 附着龈宽度达 3 mm 以上。分别于基线水平、1 个月、3 个月记录患者角化龈宽度、龈瓣水平向和垂直向宽度, 详见表 1, 同时计算受植区龈瓣表面积并加以统计记录于表 2。术前角化龈宽度为(1.15± 0.46) mm, 术后 1 月为(4.5± 0.56) mm, 术后 3 月为(4.04± 0.5) mm, 术后角化龈宽度较术前明显提高(p<0.05)。移植瓣水平向、垂直向宽度以及表面积于基线水平时分别为(9.83± 1.7) mm、(4.02± 0.61) mm、(40.4± 11.59) mm<sup>2</sup>; 术后 1 月分别为(8.97± 1.5) mm、(3.61± 0.67) mm、(32.8± 9.85) mm<sup>2</sup>; 术后 3 月分别为(8.48± 1.65) mm、(3.24± 0.67) mm、(28.02± 9.25) mm<sup>2</sup>, 与基线时比较均明显降低, 差异均具有显著差异(P<0.05)。6 例患者手术及随访照片详见图 2。

表 1 每例患者受植区瓣水平和垂直向高度

Table 1 Horizontal and vertical graft dimensions of each patient

Patient	Base line(mm)			1 month(mm)			3 month(mm)			Gingival biologic type
	KT	H-FGG	V-FGG	KT	H-FGG	V-FGG	KT	H-FGG	V-FGG	
1	1	8	4	4	8	3.5	3.5	8	3	thin
2	0.5	10	4.5	4.5	9.5	4	3.5	9	4	thin
3	1	9	4	5	8	4	4.5	7	3.5	thin
4	0.5	11	4	3.5	10	3	3.5	9	3	thin
5	1	9	4	4.5	8.5	4	4	8.5	3.5	thick
6	1.5	11	3.5	4.5	10	3.5	4.5	10	3.5	thick
7	1	13	5	5.5	11	4.5	4.5	10.5	4	thin
8	2	8	3	4	7	2.5	3.5	6	2	thin
9	1	10	4.5	4	10	3.5	4	8	3.5	thin

10	1.5	8	4	4.5	7	3.5	4	6.5	3.5	thin
11	1	9	4	4	8	3.5	3.5	8	3	thin
12	0.5	10	5	5.5	9.5	5	5	9.5	4	thick
13	1	9	4	5	8	4	4.5	7	3.5	thin
14	0.5	11	4	4	10	3	3	9	2.5	thin
15	1	8	4	4.5	7	4	4	7	3.5	thick
16	1.5	11	3	4.5	11	3	4.5	11	3	thick
17	1	13	5	5	11	4.5	4.5	11	4	thin
18	2	8	3	4	8	2.5	4	7	2	thin
19	1	10	4.5	4	10	3.5	4	9	3.5	thin
20	1.5	8	4	4.5	7	3.5	4	7	3.5	thin
21	1.5	11	4	5	10	3.5	4.5	10	3.5	thick
22	1	13	4.5	5.5	12	4.5	4.5	12	3.5	thin
23	2	8	3	4	7	2.5	3.5	6	1.5	thin

表 2 角化龈宽度, 龈瓣水平向、垂直向及表面积收缩基本数据

Table 2 Keratinized gingival width, the shrinkage of grafts in horizontal dimensions, vertical dimensions and surface area

	Base line(mm)	At 1 month after operation(mm)	At 3 month after operation (mm)
KT	1.15± 0.46	4.5± 0.56**	4.04± 0.5**
V-FGG	4.02± 0.61	3.61± 0.67*	3.24± 0.67**
H-FGG	9.83± 1.7	8.97± 1.5*	8.48± 1.65*
SA-FGG(mm <sup>2</sup> )	40.4± 11.59	32.8± 9.85*	28.02± 9.25**

Note: \*p<0.05: compared with the base line; \*\*p<0.001: compared with the base line.



图 2 病例 6 的手术及随访照片

Fig.2 Surgical and follow-up photographs of case No.6

Note: A. base line B. after 1 month C. after 3 months.

### 3 讨论

宽的角化龈可以提供更好的菌斑控制和牙周健康。对于 Miller III 类牙龈退缩伴角化龈不足, 游离龈移植技术是目前有效的治疗手段之一<sup>[9]</sup>, 其在增加附着龈宽度方面效果显著, 成功率高, 方法简便。Agarwal C 等通过对比游离龈移植术与脱细胞真皮基质同种异体移植物增加附着龈宽度的有效性, 发现两种方法附着龈宽度都显著增加, 但是 ADM 移植物的增益相对较小, FGG 更有效<sup>[10]</sup>。龈瓣收缩是游离龈移植术后愈合过程中常见现象。应用 FGG 后, 受植区周围肌肉纤维长入以及手术创口的愈合收缩会导致前庭沟变浅, 从而进一步导致移植龈瓣的收

缩现象发生, 有时候甚至导致无法获得满意的角化龈宽度增量效果<sup>[11,12]</sup>。Hatipoglu H 发现龈瓣垂直向组织收缩量在 21 天和 180 天分别为 19.7% 和 24.8%, 他们认为龈瓣 1 月左右受植区血供构建完毕, 3 月左右术区改建完成, 也就是说龈瓣收缩量在术后 3 月时达到最大量, 之后龈瓣宽度较为稳定, 因而我们选取 3 月为术后常规观察时间<sup>[6,7]</sup>。

本研究结果显示术后 1 月、3 月龈瓣垂直向收缩率分别为 10.3%、19.8%。这与国外报道的收缩率相似, Cifcibasi 报道龈瓣垂直向宽度分别基线处为 6.88± 0.91 mm, 术后 1 月时为 (6.44± 1.05) mm, 术后 3 月时为 (6.09± 1.06) mm, 垂直向收缩量分别为 6.1± 10.63% (0-1 月), 5.16± 8.7% (1 月-3 月), 10.87±



13.56%(0-3月)<sup>[7]</sup>。我们进一步测量发现术后1月、3月龈瓣水平向平均收缩率分别为8.5%、13.8%。这与Hatipoglu H报道较为一致,他们发现术后21天、180天龈瓣水平向收缩率分别为5.8%、10.2%。我们认为这种差异除了与术者技术熟练度有关,采取的龈瓣厚度有关。移植瓣的愈合依赖于供区组织瓣和受植区的血供建立,一般而言薄的龈瓣较厚的龈瓣能够更快的建立血供<sup>[13]</sup>。较薄的龈瓣(0.5-0.6 mm)具有与邻近受区牙龈组织非常好的颜色匹配性,但收缩率较大;而较厚的龈瓣(1.5-2 mm)虽然收缩率较低但会导致供区术后并发症增加以及术后软组织颜色差异较大。目前,大多数研究认为中等厚度(1-1.5 mm)是比较理想的供区龈瓣厚度<sup>[14,15]</sup>。Mormann报道术后12月内龈瓣垂直向收缩率平均可达42.3%,他们发现不同患者术后龈瓣收缩率与所获得的该龈瓣厚度有关,较薄的龈瓣收缩率可达45%,而较厚的龈瓣收缩率则为38%<sup>[16]</sup>。受限于纳入研究患者牙龈型多为薄型,我们实验选取的龈瓣厚度均在1-1.5 mm左右。

此外,患者牙龈生物型对于龈瓣收缩率也起着重要提示作用。我们进一步比较数据,发现23名患者中,有患者在术后1月垂直向和水平向尺寸改变较小。随着时间延长,这其中一位患者(No.16)龈瓣均有垂直向和水平向均无尺寸改变,而其牙龈生物型为厚型,其余患者均为薄型。Claffey也发现相比于厚生物型患者,薄型牙龈组织有更高的收缩趋势<sup>[17]</sup>。Emine对其30名患者分别测量,发现术后1月有9位患者未显示退缩量,直至术后3月才发现龈瓣退缩情况。Hassan则发现9位患者在术后21天无龈瓣退缩,8位患者在术后180天无垂直向和水平向退缩,这也导致龈瓣退缩在不同研究中统计数据差别较大(12%-48%)<sup>[18,19]</sup>。由于亚洲人较欧洲、美洲人士牙龈型偏薄型,因而龈瓣收缩程度较大,因而我们研究对象中未出现龈瓣收缩的患者比例较少,但仍需要更多的随机临床对照研究进一步证实。影响患者术后龈瓣收缩量还有冠修复、吸烟、缝线及手术技术的应用等因素<sup>[18,20]</sup>。Orsini发现FGG治疗义齿处牙龈退缩时发现龈瓣退缩率在第4、26、52周分别为28.4%、37.2%和43.25%<sup>[21]</sup>。有学者报道FGG联合应用富血小板纤维蛋白PRF(platelet-rich fibrin)可有效促进龈瓣组织愈合,但其是否对龈瓣收缩有影响尚需进一步研究<sup>[22-24]</sup>。

总之,本研究初步评估了23位患者行FGG术后移植龈瓣的收缩情况,发现术后3月内龈瓣垂直向和水平向收缩改变情况,尤其是垂直向收缩。未来需要更多的临床病例发现龈瓣收缩影响因素及相关机制,从而为患者制定个性化手术方案。

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