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血小板衍生生长因子对面部凹陷自体脂肪移植成活率的影响*

宋秀旭¹ 王法刚¹ 孟真¹ 申倩² 孙磊²

(1 山东大学附属省立医院整形美容外科 山东 济南 250021; 2 山东省胸科医院病理科 山东 济南 250013)

摘要 目的:探讨血小板衍生生长因子(PDGF)对面部凹陷自体脂肪移植成活率的影响。**方法:**选取我院自2016年3月-2017年11月收治的62例面部凹陷患者,根据治疗方案的不同分为观察组和对照组,对照组30例患者仅采用自体脂肪颗粒移植治疗,观察组32例患者在对照组基础上加用血小板衍生生长因子治疗,比较两组患者治疗的优良率和并发症的发生情况。**结果:**治疗后,观察组患者的优良率为93.75%,明显高于对照组(73.33%, $P<0.05$)。观察组患者治疗后3个月、6个月时身体脂肪吸收率明显高于术后1个月时($P<0.05$),且与对照组同时点比较,观察组患者治疗后3个月、6个月时的身体脂肪吸收率显著升高($P<0.05$)。观察组患者对治疗满意度为87.55%,显著高于对照组(70.0%, $P>0.05$)。**结论:**血小板衍生生长因子应用于治疗面部凹陷能够有效提高自体脂肪移植的成活率。

关键词:面部凹陷;血小板衍生生长因子;自体脂肪移植

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Effect of Platelet-derived Growth Factor on the Survival Rate of Facial Fat Autograft*

SONG Xiu-xu¹, WANG Fa-gang¹, MENG Zhen¹, SHEN Qian², SUN Le²

(1 Plastic surgery department, Shandong Provincial Hospital Affiliated to Shandong University, Ji'nan, Shandong, 250021, China;

2 Pathology department, Shandong Chest Hospital, Ji'nan, Shandong, 250013, China)

ABSTRACT Objective: To investigate the effect of platelet-derived growth factor (PDGF) on the survival rate of facial fat autograft. **Methods:** 62 cases of patients with facial depression treated in our hospital from March 2015 to July 2017 were selected as the experimental subjects and divided into two groups according to the different treatment schemes. 30 cases in the control group were treated with autologous fat granule transplantation only, and 32 cases in the observation group were treated with small plate derived growth factor on the basis of control group, the excellent and good rate of treatment and incidence of complications were compared between the two groups. **Results:** After treatment, the excellent and good rate of patients in the observation group was 93.75%, it was significantly higher than that of the control group (73.33%, $P<0.05$). The body fat absorption rate in the observation group was significantly higher than those at 3 months and 6 months after treatment ($P<0.05$), which were higher than those of the control group at 3 months and 6 months after treatment ($P<0.05$); the satisfaction rate of observation group was 87.55%, it was obviously higher than that of the control group (70%, $P<0.05$). **Conclusion:** Platelet-derived growth factor can improve the survival rate of autologous fat transplantation in the treatment of facial depression.

Key words: Facial depression; Platelet-derived growth factor; Autologous fat transplantation

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前言

面部凹陷是较为常见的面部肌肉组织畸形,其病因分先天发育不良和后天外伤两种,主要的表现为双侧面部不对称、面部老化导致鼻唇沟加深、颧骨过高导致颧部凹陷等^[1]。自体脂肪移植是治疗面部凹陷最有效且最安全的手段,自体脂肪来源于患者自身组织,因此具有极好的生物相容性,通过去除多余脂肪来填充凹陷区域可以让全身脂肪得到更为合理的调配。自体脂肪颗粒注射移植技术是目前治疗面部凹陷应用最广泛的手

段,但依然存在远期成活率低的缺陷,鉴于此,大量的研究者开始立足于脂肪移植的各个环节中,旨在提升远期脂肪成活率^[2,3]。

血小板衍生生长因子(Platelet derived growth factor, PDGF)是一种碱性蛋白质因子,主要储存在 α 颗粒中,临床作用具有能刺激停滞于 G_0/G_1 期的成纤维细胞、神经胶质细胞、平滑肌细胞等多种细胞进入分裂增殖周期^[4]。当机体某个组织受损时,血小板释放出的生长因子PDGF对邻近的结缔组织细胞生长有刺激作用。研究表明PDGF是创伤愈合过程中较早出现的生长因子之一,在创面愈合的全过程中起重要作用^[5]。本研究主要

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作者简介:宋秀旭(1984-),女,硕士研究生,主治医师,研究方向:自体组织移植,电话:15000144801, E-mail: songxiux_778@163.com

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探讨了 PDGF 对自体脂肪移植治疗面部凹陷患者的近远期效果。

1 资料与方法

1.1 一般资料

选取我院自 2016 年 3 月-2017 年 11 月收治的面部凹陷患者 62 例,根据治疗方案的不同分成观察组和对照组。对照组 30 例患者仅行自体脂肪移植治疗,包括男性 6 例,女性 24 例;年龄 20-47 岁,平均为(28.2±4.1)岁;颞部凹陷 11 例,颊部凹陷 7 例,上/下睑凹陷 4 例、其他 8 例。观察组患者 32 例在自体脂肪移植基础上使用 PDGF 治疗,包括男性 5 例,女性 27 例;年龄 21-44 岁,平均为(27.7±4.5)岁;颞部凹陷 13 例,颊部凹陷 5 例,上/下睑凹陷 7 例,其他 7 例。两组一般资料比较差异无统计学意义($P>0.05$),具有可比性。

1.2 纳入和排除标准

纳入标准:①患者正在进行治疗措施和本研究措施无任何影响;②研究符合相关的伦理道德,患者均自愿签署临床实验授权书,可以与医护人员积极配合的患者。

排除标准:①伴有自身免疫系统病症者,伴有急性、慢性感染患者,合并精神疾病患者等^[6];②患者依从性差或者不配合及拒绝参加研究者;③对本研究无任何禁忌症者。

1.3 治疗方法

1.3.1 对照组 采用脂肪颗粒移植手术治疗:(1)脂肪颗粒制备。选大腿外侧、后侧等脂肪丰富处为供区。常规消毒后做局部皮下肿胀麻醉,使用脂肪抽吸针抽取脂肪颗粒 10 mL(注射器规格为 10 mL),抽取完毕后保持注射器竖立状,静置约 40-60 min 获得脂肪颗粒备用。(2)脂肪颗粒移植。术前使用美蓝标记面部凹陷部位的范围,使用浓度为 0.5%的利多卡因行皮下局部浸润麻醉,依据凹陷部位的差异选择不同规格的脂肪移植注射器,采用多层次、多隧道和多点退针技术进行自体脂肪颗粒移植,尽量增加和受区组织的接触面积。面颊由上至下注射层:①额部,皮下层、额肌、额肌下层和骨膜下层;②颞部,皮下层、颞肌浅层和骨膜浅层;③颌面,皮下层、浅表肌腱膜系统、表情肌间和骨膜下层等。依据凹陷部位、脂肪注射量和医学美学形态来确定注射解剖层次,尽量让注射的脂肪颗粒均匀分布于凹陷

区域。单侧单部位每次的脂肪颗粒填充量在 0.5~22.0 mL 间,第二次填充时间应最少间隔 4 个月,再次填充时徐根据脂肪颗粒吸收情况确定填充数量和解剖层次^[5]。(3)术后处理。脂肪颗粒供区需要加压包扎 3-5 d,面部脂肪移植治疗后无需包扎、固定,穿刺孔处涂抹抗生素软膏,防止感染。

1.3.2 观察组 该组患者使用脂肪颗粒+PDGF 注射治疗,脂肪颗粒制备同对照组。取由 Sigma 公司生产的 PDGF-AB,以 1:3 的比例将脂肪颗粒和 PDGF 混合备用。注射前使用利多卡因局麻,在移植区皮肤下进行注射,穿刺角度约为 30°,具体注射方法同对照组。

1.4 观察指标

(1)术后随访 12 个月,比较两组患者治疗的优良率,优:患者面部轮廓美观自然,凹陷处平坦双侧对称,填充物柔和饱满,无不良反应;良:患者凹陷部位平坦,双侧基本对称,无不良反应;差:面部凹陷处略高好转或无明显变化^[7,8]。优良率=(优+良)/总例数×100%。(2)自体脂肪吸收率。分别于术后 1 个月、6 个月时测定移植脂肪颗粒的成活率,计算公式:吸收率=移植脂肪减少体积/移植当天脂肪体积%。(3)填充满意度^[9]。使用视觉模拟评分量表(Visual analogue scale, VAS)评估两组患者术后 6 个月时的填充效果主观感受,满分为 10 分,8-10 分为满意,5-7 分尚可、<5 分为不满意,满意度=(满意+尚可)/总例数×100%。

1.5 统计学方法

应用 SPSS13.0 统计软件进行,计量资料以均值±标准差($\bar{x} \pm s$)表示,组间比较采用独立样本 t 检验;计数资料用百分比(%)表示,组间比较采用卡方检验(χ^2)。以 $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 两组患者治疗优良率的比较

移植术后随访 1 年,与对照组治疗优良率[73.33%(22/30)]比较,观察组治疗优良率[93.75%(30/32)]显著升高($\chi^2=4.771$, $P<0.05$),详见表 1 所示。

表 1 两组患者治疗优良率对比[例(%)]

Table 1 Comparison of the excellent and good rate of treatment between two groups of patients[n(%)]

Groups	Cases	Excellent	Good	Invalid	Excellent and good rate
Control group	30	13(43.33)	9(30.0)	8(26.67)	73.33
Observation group	32	20(62.5)	10(31.25)	2(6.25)	93.75
χ^2	-	-	-	-	4.771
P	-	-	-	-	0.029

2.2 两组患者移植后自体脂肪吸收率对比

观察组患者术后 1、6 个月时自体脂肪吸收率均显著高于对照组($P<0.05$),详见表 2 所示。

2.3 两组患者主观满意度对比

治疗后,观察组患者满意度为 87.5%,高于对照组(70.0%),差异具有统计学意义($\chi^2=2.862$, $P>0.05$),详见表 3 所示。

3 讨论

面部凹陷是最为常见的衰老特征,但也有很多患者是先天性面部凹陷,主要表现为面颊部、颞部等有不同程度的凹陷^[10]。近年来,随着国人生活质量的提升,人们对外貌美观的需求逐渐升高,如何修复自身面部缺陷成为患者的普遍诉求和临床的研究热点^[12]。

表 2 两组患者脂肪颗粒移植后吸收率对比($\bar{x} \pm s, \%$)

Table 2 Comparison of the absorptivity between two groups of patients after fat granule transplantation

Groups	Cases	At 1 month after treatment (%)	At 6 months after treatment (%)
Control group	30	41.2 $\pm$ 11.4	59.6 $\pm$ 7.7
Observation group	32	49.5 $\pm$ 10.8	66.8 $\pm$ 8.2
t	-	2.944	3.668
P	-	0.046	0.001

表 3 两组患者主观满意度比较[例(%)]

Table 3 Comparison of the subjective satisfaction between two groups of patients[n (%)]

Groups	Cases	Satisfied	Moderately satisfied	Dissatisfied	Satisfaction
Control group	30	13	8	9	70.0
Observation group	32	18	10	4	87.5
χ^2	-	-	-	-	2.862
P	-	-	-	-	0.091

自 1889 年首例游离脂肪移植临床应用成功后,脂肪移植技术迅速发展,目前普遍应用于面部除皱、祛疤等美容治疗中^[13]。自体脂肪细胞填充可以降低免疫排斥反应,但是单纯使用脂肪颗粒填充因纤维囊、脂肪颗粒吸收率等影响治疗效果,因此在各种生长因子联合脂肪颗粒填充治疗成为新的趋势^[14,15]。自体脂肪移植主要指通过评估从自身其他部位比如腰、腹、大腿等部位的脂肪,经过相关的处理后挑选完整的脂肪颗粒,进行精细化注射技术,在需要的地方进行填充、塑性等^[16,17]。

PDGF 是储存于血小板 α 颗粒中的碱性蛋白质,其具有趋化活性、缩血管活性、促分裂效应和参与磷酸酯酶激活等作用^[18]。自上个世纪 90 年代起 PDGF 逐渐被应用于组织工程之中,该物质能够促进成纤维细胞增殖、血管再生以及基质的合成,能够趋化和刺激成纤维细胞、间质干细胞有丝分裂,同时可以活化巨噬细胞^[19,20]。有研究^[21,22]将富含 PDGF 的富血小板血浆应用于裸鼠的光老化模型治疗中,结果显示相较空白组使用富血小板血浆的治疗裸鼠其背部皱纹减少显著,经检测真皮厚度较治疗前增加明显。当人体某个组织受损时,凝血块会止住出血,临床实验研究显示 PDGF 为血小板释放的最为重要的因子之一,在伤口愈合中起着重要的先锋队作用,主要应用于创伤愈合中^[26,27]。国外研究发现^[29,30]PDGF 在伤口愈合过程中,可促进与伤口修复有关的细胞增殖,加强肉芽组织的形成,促进伤口愈合并缩短愈合时间^[31-33]。

本实验结果显示观察组患者移植一年后的优良率为 93.75%,远高于对照组的 73.33%,与 Li X H 等人的研究结果基本一致^[23]。此外,观察组患者的两个时段的自体脂肪吸收率均高于对照组,主要的原因可能在于 PDGF 是一种丝裂原,能够刺激前脂肪细胞的生长,同时还具备抗凋亡的效果^[24,25],因此能更长时间的存活且被组织吸收,提升脂肪移植的成活率^[10]。面部凹陷患者治疗需求和期望值也是临床疗效的参考的主要指标,采用 PDGF 联合自体脂肪移植治疗的患者术后 6 个月时的满意度达到了 87.5%,而对照组仅为 70.0%,提示联合使用 PDGF 的近远期效果均能满足患者要求。

综上所述,PDGF 联合自体脂肪移植治疗面部凹陷可提升移植成活率,提高患者的满意度,值得推广使用。

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